Oral Presentations

**OP01-1**

The Phenomenon of Fetal Liver Regeneration Activity after Liver Resection

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**Backgrounds:** The process of liver regeneration is very complex and is dependent on the etiology and extent of liver damage and the genetic background. Liver regeneration is still not fully understood. The liver is a unique organ, and first in line, the hepatocytes encounter the potential to proliferate during cell mass loss. This phenomenon is tightly controlled and resembles in some way the embryonic co-inhabitant cell lineage of the liver, the embryonic hematopoietic system.

**Methodology:** The experimental research was conducted on white lab rats. The animals were divided in two groups. First group consists of fetal rats (two weeks old), second group – 5 month age mature female rats. In both of groups was done 25% resection of liver tissue. After 24, 48 and 72 hours was investigated time of maximal activity of DNA, mitochondria synthesis and hepatocytes proliferation.

**Results:** Laboratory investigations were shown, that after 24 hours in 1-st group was significant increase of mitochondria synthesis. After 48 hours in 1-st group of experimental animals was not changes of hepatocyte size, while in 2-nd group were seen hepatocyte enlargement and temporary increase in numbers of lysosomes, autophagosomes, and micro bodies. There was the different commencement of DNA synthesis and mitosis in the hepatocytes of 1-st with later extension in the hepatocytes of 2-nd group. Thus, the time of maximal activity was indicated in 1-st group much more earlier than in 2-nd group of experimental animals.

**Keywords:** Liver, Regeneration, Hepatocyte.

**OP01-2**

ICG-Fluorescence Guided Liver Resection

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**Backgrounds:** Anatomic resection for HCC has been regarded as effective and the standard procedure, however, how to identify a division line in anatomic resection remains a technical problem. Although injection of indigocarmine to the target portal vein is the first choice for the identification, it is difficult to know clear demarcation line in some cases. Another possible choice is staining hepatic segment using indocyanine green (ICG)-fluorescence imaging.

**Methods:** The procedures, which will be shown in detail using a video clip during a presentation, are summarized, as follows. After hepatic mobilization, mixture of indigocarmine (5 ml) and ICG (0.25 mg) is injected into a portal venous branch corresponding to the hepatic segment to be identified. Fluorescence images of the liver surfaces were obtained using a commercially-available near-infrared light camera system following injection of ICG solution. Then, hepatic parenchyma was transected along a demarcation between fluorescing regions and non-fluorescing lesions. To evaluate the efficacy of this technique, we used both ICG fluorescence imaging and indigo-carmine staining in 30 patients undergoing anatomic segmentectomies for hepatic malignancies between 2012 and 2014.

**Results:** Outcomes of the indigo-carmine staining technique were classified as ‘effective’ in 17 patients (57%) and ‘fair’ in 13 patients (43%), while identification of hepatic segments by ICG fluorescence imaging was deemed ‘effective’ in all 30 patients (100%).

**Conclusion:** The ICG fluorescence imaging has become one of the basic techniques for liver surgery.

**Keywords:** Indocyanine green, Fluorescence, Anatomic resection.
Role of Everolimus in Reducing the Hepatocellular Carcinoma Recurrence after Living Donor Liver Transplantation for Patients within UCSF Criteria: Re-Inventing the Role of Mammalian Target of Rapamycin Inhibitors in Liver Transplantation

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Background: The protective effect of everolimus (EVR) on the hepatocellular carcinoma (HCC) patients that receive liver transplantation in terms of reducing the recurrence has not been sufficiently investigated in clinical trials. In this study, we intend to analyze the effects of EVR as an immunosuppressant when started in early phase after living donor liver transplantation (LDLT) on the HCC recurrence.

Methods: From January 2011 to June 2013, a total of 250 patients underwent LDLT for HCC at our institute. The patients with HCC within the UCSF criteria were included in the study and divided in two groups depending upon the postoperative immunosuppression. Group A patients (n = 37) received EVR along with calcineurin inhibitor (CNI) immunosuppressive therapy while group B patients (n = 29) received CNI based immunosuppressive regimen.

Results: The mean age of Group A recipients (Male: Female, 28:9) was 56.6 years while for Group B patients (Male: Female, 21:8) it was 54.7 years (range, 31 to 69). The trough level for the EVR was 3.47 ± 1.53 ng/ml (range, 1.5–11.2) for a daily dose of 1.00 ± 0.25 mg/day. For TAC, the average trough level was 6.97 ± 3.98 ng/ml (range, 2.50 to 11.28 ng/ml). The 1-year, 3-year and 4-year overall survival achieved for Group A patients was 94.95%, 86.48% and 86.48%, respectively while for Group B patients it was 82.75%, 68.96%, and 62.06%, respectively (p = 0.0217). There were no complications related to hepatic arterial thrombosis, wound infection or incisional hernia in either of the groups.

Conclusions: This retrospective study shows a significant correlation of EVR+TAC based immunosuppression therapy and long term survival of the LDLT recipients that have HCC within the UCSF criteria. As per our experience, the positive impact of EVR on the reduced HCC recurrence is more significant if EVR is started early phase after LDLT.

Keywords: Everolimus, Living donor liver transplantation, Hepatocellular carcinoma, HCC recurrence, Tacrolimus.
**Objectives:** To clearly define SFSS and to identify its pathogenesis, risk factors, possible specific management and outcome.

**Patients and Methods:** During the period from April 2003 to the end of 2013, 174 adult-to-adults LDLT (A-ALDLT) had been performed at our National Liver Institute (NLI). The records of these patients were retrospectively analyzed in the period from the end of 2013 to the end of 2015 to study cases with SFSS.

**Results:** Twenty (11.5%) recipient had SFSS, of whom 16 patients (80%) had SFSF and 4 patients (20%) had SFSNF. While small for size graft (SFSG) (Graft recipient weight ratio (GRWR) >0.8)) was present in 9.7% (n = 17/174), Graft size in SFSS cases were classified to extra-small (GRWR <0.8) in 10 cases, small (GRWR 0.8 and <1) in 5 cases and medium sized (GRWR ≥1) in 5 cases. While extra-small graft, PHTN, steatosis and LL graft were significant predictors of SFSS in univariate analysis, only graft size was independent predictor of it on multivariate analysis. Splenectomy was tried in 7 patients at the time of transplantation of extra-small graft aiming to prevent its occurrence. The SFSS related mortalities were recorded in 13/20 patients (65%).

**Conclusion:** SFSS following LDLT has deadfall outcome. Small graft represents the main obvious causing factor. Splenectomy may be used in cases with extra-small grafts to avoid SFSS but of controversial value and should be further studied before being addressed as a beneficial management of SFSS.

**Keywords:** Living donor, Liver transplantation, Outcome post LDLT, SFSS.

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**OP01-6**

**Impact of Donor-Recipient Genetic Relationship on Outcome of Living Donor Liver Transplantation. A Single Center Experience**

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**Introduction:** Living donor liver transplantation (LDLT) is a valuable option for expanding donor pool, especially in localities where deceased organ harvesting is not allowed. In addition, rejection rates were found to be lower in LDLT, which is attributed to the fact that LDLT is usually performed between relatives. However, the impact of genetic relation on the outcome of LDLT hasn’t been studied. In this study, we examined the difference in rejection rates between LDLT from genetically related (GR) donors and genetically unrelated (GUR) donors.

**Patients and Methods:** All cases that underwent LDLT during the period from May 2004 till May 2014 were included in the study. The study group was divided into 2 groups; LDLT from GR donors and LDLT from GUR donors.

**Results:** Three-hundred and eight patients were included in the study; 214 from GR donors and 94 from GUR donors. HLA typing wasn’t included in the workup for matching donors and recipients. GUR donors were wives (36; 11.7%), sons in law (7; 2.3%), brothers in law (12; 3.9%), sisters in law (1; 0.3%) and unrelated (38; 12.3%). The incidence of acute rejection in GR group was 17.4%, and in GUR group was 26.3% (p-value = 0.07). However, there was a significant difference in the incidence of chronic rejection between the 2 groups; 7% in GR group and 14.7% in GUR group (p-value = 0.03). In terms of overall survival, there was no significant difference between both groups.

**Conclusion:** LDLT from GUR donors is not associated with higher incidence of ACR. However, GR was significantly lower when grafts are procured from GR donors. HLA matching may be recommended before LDLT from GUR donors.

**Keywords:** Living donor liver transplantation, Genetically related, Genetically unrelated, Acute rejection, Chronic rejection, HLA-matching.

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**OP01-7**

**Prior Trans-Arterial Chemoembolization-A Protective Factor against Rapid HCV Recurrence Post Liver Transplant in Patients with HCV with HCC? – A Retrospective Analysis**

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**Background:** HCV recurrence after liver transplant is nearly universal and results in progressive fibrosis, cirrhosis, graft loss, re-transplantation and mortality. There are very few studies comparing impact of pre transplant HCC therapies either as a bridge to transplant or to downstage like TACE, hepatectomy, RFA, PEI or HCV recurrence post transplant. Primary aim of the study was studying prognostic factors associated with HCV recurrence including pre transplant HCC therapies.

**Material and Methods:** All the patients who have undergone living donor liver transplantation at Kaohsiung Chang gung memorial hospital, Taiwan for HCV related HCC between July 2002 and June 2012 were analyzed retrospectively. Severity of HCV histological recurrence was categorized according to the ISHAK hepatitis activity index score. Rapid HCV recurrence was defined ISHAK hepatitis activity index (HAI) score greater than 4 at one year.

**Results:** One hundred and nine patients with HCC associated with HCV underwent living donor liver transplant from July 2002 to June 2012. Median follow up time was 31 months. Forty nine patient had significant hepatitis c recurrence at the end of one year (HAI >4) and were included in study group. 60 patients without significant hepatitis c recurrence were included in control group. On univariate analysis patients who did not underwent pre-transplant trans arterial chemoembolization (0.035), primary transplant (without prior hepatectomy) (p = 0.031), high meld score (pc = 0.036), high viral load pretransplant (0.007), High AFP levels (0.013) were significantly associated with rapid histological recurrence of HCV. Total 61 patient underwent prior transarterial chemoembolization, 22 of these patients developed significant HCV recurrence while 39 patient did not developed HCV recurrence. On multivariate analysis only patient who did not underwent TACE were significantly associated with rapid histological recurrence of HCV.
**Conclusion:** Prior TACE do not increase post transplant HCV recurrence but may be beneficial for it.

**Keywords:** Liver transplant, Hepatitis C, Hepatocellular carcinoma.

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**OP01-8**

The Long Term Outcome of Adult ABO-Incompatible Living Donor Liver Transplantation

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**Background:** We started adult ABO-incompatible living donor liver transplantation (ABOI-LDLT) in 1998. We investigated the long term outcome of recipients who underwent ABOI-LDLT in our center.

**Patients and Methods:** We retrospectively assessed medical records of recipients who underwent ABOI and non ABOI-LDLT since 1997 and survived longer than 1 year after transplantation. We analyzed survival rate, incidence of de novo malignancy occurrence (solid cancer and PTLD), and markers of diabetes mellitus and renal function (HgbA1C and CRTNN, and eGFR).

**Results:** There were 26 cases of ABOI-LDLT (ABOI group) and 88 cases of non ABOI-LDLT (compatible or identical)(non ABOI group). There were no significant differences of patient background between the groups except calcineurin inhibitor usage (tacrolimus and cyclosporine, 81% and 19% in ABOI, 51% and 49% in non ABOI, p < 0.05). Five-year survival rates were 90.0% and 92.7% in ABOI group and non ABOI group, respectively. Incidences of solid cancer were 11.5% and 6.8% and those of PTLD were 3.8% and 4.5% in ABOI group and non ABOI group, respectively. There were no significant differences of survival rate and incidences between the groups. There were also no differences of values of HgbA1c and CRTNN at the time of 1, 3, 5, and 10 years after transplantation except eGFR at 3 years after transplantation (72 ± 25 in ABOI, 58 ± 20 in non ABOI, p < 0.05).

**Conclusion:** Our data suggest that the long term outcome of recipients who underwent ABOI-LDLT is comparable to that of non ABOI-LDLT.

**Keywords:** ABO-incompatible.

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**OP01-9**

Outcomes of Therapy for Recurrent Hepatitis C after Living Donor Liver Transplantation

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**Background:** Novel direct-acting antiviral agents (DAA) is recently demonstrated to be efficient and safe in patients with hepatitis C virus (HCV). We assessed the outcomes of patients with recurrent hepatitis C after living donor liver transplantation (LDLT) who received anti-HCV therapy including DAA at our hospital.

**Patients and Methods:** We retrospectively assessed medical records of recipients who underwent LDLT due to HCV liver cirrhosis and analyzed the sustained virological response (SVR) rate of each therapy. Anti-HCV therapy included PEG-IFN(+RBV) (-2013), SMV/PEG-IFN/RBV (2014–2015), and IFN free DAA (2015-). DAA was selected based on genotype and resistance test.

**Results:** There were 43 recipients who underwent LDLT due to HCV liver cirrhosis. Eighteen received PEG-IFN(+RBV), 10 received SMV/IFN/RBV, and 8 received IFN free DAA for recurrent hepatitis C after LDLT. INF free DAA included DCV/ASV in 1, SOF/LDV in 6, SOF+RBV in 1 recipient. SVR rate was 56% in PEG-IFN(+RBV), but was improved to 80% in SMV/PEG-IFN/RBV by extending duration of PEG-IFN/RBV. In the 8 recipients of IFN free DAA, 4 recipients (1 DCV/ASV and 3 SOF/LDV) already achieved SVR, and 4 recipients (3 SOF/LDV and 1 SOF+RBV) achieved RVR or EVR. No severe complications associated to IFN free DAA have not been observed.

**Conclusion:** Outcomes of therapy for recurrent hepatitis C after LDLT have been improved after introduction of DAA. Especially, IFN free DAA can be a convenient and safe option by appropriate selection based on genotype and resistance test.

**Keywords:** Direct-acting antiviral agent, Living donor liver transplantation, Recurrent hepatitis C, Virological response.

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**OP02-1**

Thoracoscopic Esophagectomy with Total Mediastinal Lymphadenectomy in Esophageal Cancer Patients with Near Complete Response to Neoadjuvant Chemoradiotherapy: Feasibility and Significance

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**Background:** Neoadjuvant therapy followed by surgery is the current recommended treatment for esophageal cancer. However, there is controversy over the extent of lymphadenectomy in pa-

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**Abstracts**
Patients with near complete response to neoadjuvant chemoradiotherapy.

Methods: Patients with resectable squamous cell carcinoma of the esophagus (cT1-3, N0-1, M0) who had near complete response to neoadjuvant chemoradiotherapy were included in this prospective study. Near complete response was defined as no obvious residual tumor on contrast-enhanced computed tomography and upper gastrointestinal endoscopy with biopsy done 5 weeks after completion of chemoradiotherapy. Thoracoscopic esophagectomy with total mediastinal lymphadenectomy was performed in all patients.

Results: During the study period from July 2013 to December 2015, 21 patients fulfilled the inclusion criteria. Median (range) age was 51 (40–74) and the majority were males (13/8). The tumor was located in the upper, middle and lower thoracic esophagus in 1, 12 and 8 patients respectively. Median (range) operation time for thoracoscopic phase was 215 (165–315) minutes, median (range) blood loss was 75 (50–200) ml and there was no conversion to thoracotomy. Total median (range) lymph node count and mediastinal lymph node count were 18 (11–32) and 11 (6–18) respectively. Sixteen patients (16/21, 76.2%) had a pathological complete response of the primary tumor in the esophagus. Of the 16 patients, 7 had (43.8%) metastasis in the lymph node. Of the 7 patients, 5 (71.4%) patients had isolated lymph node metastasis along recurrent laryngeal nerves. There was no postoperative mortality and transient vocal cord palsy occurred in 4 (19.1%) patients.

Conclusions: Thoracoscopic esophagectomy with total mediastinal lymphadenectomy is feasible after neoadjuvant chemoradiotherapy. A significant number of patients with a pathological complete response of the primary tumor had mediastinal lymph node metastasis. Total mediastinal lymphadenectomy might be indicated even in esophageal cancer patients with near complete response to neoadjuvant chemoradiotherapy.

Keywords: Esophageal cancer, Neoadjuvant chemoradiotherapy, Complete response.

OP02-2
Laparoscopic Total & Near Total Gastrectomy with D2 Lympadenectomy for Advanced Gastric Cancer: Short Term Outcomes
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Background: Laparoscopic surgery has increasingly substituted open surgery in many cancer fields especially gastric cancer. The main goal in radical gastrectomy is achieving an excellent lymph node dissection. Open gastrectomy with D2 lymphadenectomy is increasingly becoming the standard for advanced gastric cancer (AGC). D2 has been shown to more precisely predict prognosis at least in Japanese literature. Laparoscopic D2 lymphadenectomy with total or near total gastrectomy is still in question. We examined our ability to perform D2 gastrectomy laparoscopically at Jordan Hospital.

Methods: We retrospectively reviewed our prospectively collected patient data since Aug 2010–Aug 2015, for gastric cancer. We analyzed patients demographics, tumor location, tumor type, operative findings, pathological staging number lymph nodes obtained, and 30–day morbidity & mortality.

Results: We identified 51 patients who had gastric cancer. Average age was 54.6 years, male to female ratio was 3.6:1. Tumors were located in proximal-mid lesser curvature in 61% (31/51) of cases with esophageal involvement in 5 cases, distal lesser curvature in 24% (12/51) while greater curvature in 16% (8/51). 82% (42/51) of tumors were gastric adenocarcinoma with variable degree of differentiation, 10% (5/51) was signet ring carcinoma, with 4% (2/51) sarcomatoid carcinoma. All patients were approached laparoscopically. 2 patients were known advanced metastatic cancer underwent palliative proximal gastrectomy with esophagogastric anastomosis. 9 patients had peritoneal seeding upon entry and the procedure was aborted. 30 patients underwent total gastrectomy with D2 lymphadenectomy, while the remaining 2 underwent near total gastrectomy with D2 lymphadenectomy. Average lymph nodes retrieve in specimens was 22 (8–41). One patient with advanced metastatic developed massive stroke and death 5 days after the procedure. One patient developed leak requiring CT guided drainage only.

Conclusion: Laparoscopic D2 gastrectomy can be performed safely with excellent lymph node yield and better staging.

Keywords: Laparoscopic gastrectomy, D2 lymphadenectomy, Advanced gastric cancer.

OP02-3
Minimum Invasive Surgery for Submucosal Tumors-Comparison between Laparoscopic Intragastric Surgery and Laparoscopic Endoscopic Corporative Surgery
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Aims: The aim of this study was to examine the feasibility of minimum invasive surgery in patients with submucosal tumors (SMT) of the lumen prominence type in upper gastrointestinal (UGI) tract.

Methods: From 1998 through 2016, forty-five consecutive patients with submucosal tumors (GIST, NET, and others) who underwent minimum invasive surgery were enrolled in this retrospective study.

Results: Twenty-five patients underwent intragastric surgery (ITGS) for gastric GIST, while the other 20 patients underwent laparoscopic endoscopic corporative surgery (LECS) for gastric GIST and duodenum SMT. In our methods of LECS, we reduced the number of the ports (3 ports), and used 3 mm forceps. In ITGS, we assumed only upper and posterior gastric portion for surgery. On the other hand, in LECS, we assumed all portions of stomach and duodenum for surgery. Although the operative time and blood loss was no significant difference between ITGS and LECS group (p@min vs. @min), recovery speed after surgery (water intake starting date) was earlier in LECS group than ITGS group (P = 0.017). All patients who underwent ITGS and LECS had no postoperative complication.
Conclusion: ITGS and LECS are feasible procedures in patients with SMT of the lumen prominence type in UGI tract. In particular, LECS is recommended because this strategy can be adaptive in all sites of upper GI tract.

Keywords: Minimum invasive surgery, Submucosal tumors, Laparoscopic intragastric surgery, Laparoscopic endoscopic corporative surgery.

OP02-4
Pancreatic Fistula after D1+/D2 Radical Gastrectomies – Are There Any Risk Factors or Clinical Consequences? A Single Team Experience in a Surgical Center in East Europe
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Background/Aim: Postoperative pancreatic fistula (POPF) is considered a serious complication after D1+/D2 radical gastrectomies. However, few studies have explored potential risk factors for POPF development, and its clinical consequences are poorly investigated, particularly in Western patients. The study aims to evaluate the incidence, risk factors and clinical consequences of a POPF after D1+/D2 gastrectomies.

Patients and Methods: Between 2002 and 2015 a total number of 226 D1+/D2 radical gastrectomies were performed by a single surgical team. The data were retrospectively analyzed from a prospectively gathered electronic database. The POPF was defined and graded according to the International Study Group for Pancreatic Surgery definitions. Univariate and multivariate analyses were performed to identify potential predictors.

Results: A POPF was the most frequent complication in the present cohort (17 patients – 7.5%); grade A (5 patients – 2.2%), grade B (5 patients – 4.8%) and grade C (1 patient – 0.5%). Splenopancreactectomy was found to be the only independent risk factor for POPF after D1+/D2 gastrectomies upon a multivariate analysis (OR 5.538; 95% CI 1.548–19.812; p = 0.008). No other factors including age, comorbidities, type of gastrectomy, bursectomy or splenectomy alone were found as predictors for POPF. Although it was associated with an increased hospital stay (p < 0.001), however, a POPF was not associated with an increased number of other complications or increased severity or mortality rates.

Conclusion: In this relatively large series of western patients, although it was the most common source of morbidity after D1+/D2 gastrectomies, however, a POPF was not a worrisome complication because its clinical impact was not significant, except for the prolonged hospital stay. Splenopancreactectomy was the only factor associated with a high risk of POPF formation.

Keywords: Radical gastrectomy, Pancreatic fistula, Outcome.

OP02-5
Survival Benefit of Distal Gastrectomy for Gastric Cancer in Patients Aged 85 Years or Older
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Background: The aim of this study was to compare the long-term outcome of patients aged 85 years or older with gastric cancer who underwent curative distal gastrectomy or best supportive care only.

Methods: Our study examined 50 patients treated by distal gastrectomy (OP group) and 57 patients treated by best supportive care only (BSC group). To reduce bias in patient selection, we conducted propensity score analysis in the present study. The propensity score was estimated using a logistic regression model based on the following variables; gender, age, clinical cancer stage, the PS score, serum albumin level, and the Physiological POSSUM Score. Their long-term survival was compared using the Kaplan-Meier method.

Results: Twenty-five pairs of patients after propensity score matching were generated. The median overall survival time was 1967 days for OP, while it was 502 days for BSC. It was significantly better with OP by log-rank test (P = 0.0003).

Conclusions: Our propensity score matched study suggested that surgery provided significantly better long-term survival than best supportive care only for gastric cancer patients aged ≥85 years.

Keywords: Gastric cancer, Aged, Surgery.

OP02-6
Postoperative Anemia after Gastric Surgery in Early/Advanced Gastric Cancer Patients: Incidence and Predisposing Factors
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Background/Aims: The purpose of this study was to identify and analyze predisposing factors affecting post-operative anemia in gastric cancer patients.

Methodology: In this retrospective cohort study, the data of 134 early or advanced gastric cancer patients who had gastric surgery was collected up to 36 months after the surgery. In each follow up period, patients were divided into two groups, normal and anemic, and all variables were compared.

Results: Before surgery, 36.6% patients had anemia; however, at 36 months, 32.7% remained anemic. Advanced gastric cancer patients were more likely to have anemia in the preoperative period than early gastric cancer patients, but the differences were no longer observed after the surgery. Also, there was no correlation between anemia and operation methods or the types of anas-
Background: In the present era of functional preserving surgery, proximal gastrectomy (PG) with D1+ lymph node dissection is widely accepted as a treatment option for early gastric cancer located at the upper third of the stomach and the esophagogastric junction by Japanese guidelines. Although several reconstructive procedures have been reported, optimal procedure remains unknown. In the current study, nutritional status of patients who underwent PG with double tract reconstruction were analyzed according to food passing route.

Method: From January 2009 to April 2015, thirty eight patients underwent PG with double tract reconstruction in our institution were enrolled in this study. The patients were divided into two groups according to food passing root by postoperative contrast gastrography: Double tract (DT), both remnant stomach and jejunum; Non-double tract (NDT) only remnant stomach or jejunum. We compared the nutritional status such as body weight (BW), body mass index (BMI), prognostic nutritional index (PNI), serum albumin (Alb) at one year after operation between DT and NDT.

Result: Among 38 patients, 23 were males and 15 were female. Average age was 70.8 (36–93) years old. In DT, 21 patients underwent by laparoscopic PG (LPG) and 4 patients by open PG (OPG). In NDT, 8 patients by LPG and 5 patients by OPG (p = 0.06). There was no significant difference of reduction rate and value of BW, BMI, Alb and PNI. However, in elderly patients (over 75 years old), DT patients have significantly less the reduction rate (DT: 0.94% vs. NDT: 21.1%, p = 0.03) and value (DT: −0.06 vs. NDT: −0.88, p = 0.03) of Alb at one year after operation.

Conclusion: In PG with double tract reconstruction, this current study suggested that DT route have superior impact on nutrition status, especially in elderly patients.

Keywords: Proximal gastrectomy, Double tract reconstruction, Nutrition.
biliary drainage alone for patients presenting with advanced hilar CCs.

**Methods:** A retrospective analysis of the institutional database identifying all patients who presented with a diagnosis of hilar CC between December 1999 to January 2011.

**Results:** Of the 232 patients 72 (31%) patients treated with PDT (Group A) and 71 (31%) patients treated with endoscopic biliary drainage alone (Group B). Median survival was 9.8 months (95% CI, 7.42–12.25) in group A and 7.3 months (95% CI, 4.79–9.88) in group B (p = 0.029). On multivariate analysis, biliary drainage without PDT (p = 0.025) and a higher T stage (p = 0.002) were significant predictors of shorter survival in overall patients. In subgroup of analysis in PDT groups, lower pre-bilirubin level (p = 0.005), multiple PDT treatments (p = 0.044), and shortest time to treatment after diagnosis (p = 0.013) were significant predictors of improved survival. The median metal stent patency was longer in group A than B (215 days vs. 181 days; p = 0.018).

**Conclusions:** PDT with stenting resulted in longer survival compared with stenting alone and also showed the survival benefit of early PDT after diagnosis and multiple PDTs. Metal stent patency was longer in patients receiving PDT. A higher T-stage appears to be an indicator of early mortality in advanced bile duct cancer treated with PDT.

**Keywords:** Bile duct cancer, Palliative endoscopic stenting, Percutaneous transhepatic cholangioscopy, Outcome, survival.

**OP03-3**

TAGLN2 Is a Novel Diagnostic Marker in Human Biliary Tract Cancer

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**Background:** Biliary tract cancer (BTC) is one of the lethal malignancies. In this study, we investigated the function and potential role as a diagnostics of CSCs related novel biomarker TAGLN2 discovered from comparison of cDNA microarray between sphere and adherent cell populations of biliary tract cancer cell lines.

**Methods:** Among the candidates raised from cDNA microarray between sphere (CSC characteristics) and adherent cells, we focused on the TAGLN2 gene. TAGLN2 expression was confirmed by RT-PCR and western blot analysis in sphere cells and BTC cell lines. To evaluate as a diagnostic marker in BTC, the TAGLN2 expression levels were analyzed in 93 patients who were enrolled in a prospective biliary tract cancer cohort study (Group I), 10 patients who were diagnosed with common bile duct stone (Group II), and 56 patients without disease (Group 3) in Severance hospital.

**Results:** The expression of stemness and c-met signaling cascades were up-regulated in sphere cells compared with adherent cells. TAGLN2 was also up-regulated in sphere cells. TAGLN2 was highly expressed in most of BTC cell lines and tissues. Stable knockdown of TAGLN2 reduced cell proliferation, migration and invasion. Suppression of TAGLN2 also inhibited sphere forming/colony forming abilities and tumor growth. Furthermore, TAGLN2 silencing led to reduced expression of c-met, phosphorylated AKT and nanog. To confirm TAGLN2 as a BTC novel biomarker, we used 159 individual plasma samples, BTC (n = 93), CBD stone (n = 10), and normal (n = 56), and checked their differential expression by Western blot analysis. The band intensity of samples from the BTC patient group was significantly higher than that of either
health donor or CBD stone groups, confirming TAGLN2 as a BTC biomarker.

**Conclusions:** We found that BTC stem cells related biomarker TAGLN2 plays a valuable diagnostic role in BTC.

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**OP03-4**

**Standardization of Surgical Techniques for Advanced Perihilar Cholangiocarcinoma Based on Laennec’s Capsule**

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**Introduction:** We proposed the novel concept of the liver anatomy based on Laennec’s capsule that contributed to standardize anatomical liver resection with extrahepatic Glissonian pedicle isolation and landmark vein exposure. Nowadays, we applied this concept to highly advanced hepatobiliary surgery such as perihilar cholangiocarcinoma. Perihilar cholangiocarcinoma is the cancer affecting the plate system and the non-touch isolation technique of the plate system is required. Extrahepatic Glissonian pedicle-first isolation without parenchymal destruction standardizes the surgical procedure of extended liver resection with total caudate lobectomy combined with or without vascular reconstruction.

**Surgical Techniques:** For left-side dominant case, the root of the posterior pedicle was first isolated and individual vessels were taped. Demarcation line was confirmed and left trisectionectomy with total caudate lobectomy combined with both portal and arterial reconstruction was performed. While for the right-side dominant case, the root of the umbilical pedicle (G2+3+4) or the lateral pedicle (G2+3) was isolated first according to the extent of horizontal cancer invasion. Thereafter, the Spiegel pedicle was isolated and the individual vessels were isolated. In the case of portal reconstruction, the left portal vein should be isolated distal to the Arantius duct whereas in the case of preservation, the Spiegel vessels should be divided for the en-bloc resection of the caudate lobe.

**Conclusion:** The novel concept of the liver anatomy based on Laennec’s capsule contributes to advanced perihilar cholangiocarcinoma.

**Keywords:** Perihilar cholangiocarcinoma, Laennec’s capsule, Liver resection.
OP03-6
Percutaneous Intraductal Radiofrequency Ablation Plus Biliary Stenting for Malignant Biliary Obstruction
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Aim: To evaluate the safety and feasibility of percutaneous intraductal radiofrequency ablation (RFA) for malignant obstructive jaundice.

Method: 16 patients unable to surgical resection of malignant obstructive jaundice were selected for this study prospectively, these patients underwent percutaneous intraductal biliary radiofrequency ablation. Following ablation, they had a metal stent inserted and a external drainage tube. All the patients were closely observed and followed up after the procedure.

Result: The intraductal RFA was achieved in all patients successfully and left metal biliary stents and external biliary drainage tube. No complications such as biliary bleeding and perforation, cholangitis occurred in two cases which were cured with conservative treatment. Jaundice remission rate in seven days was 75.0% (12/16); Eight patients dead of serious drain with advanced tumors, others were survival. Jaundice recurrence occurred in 3 patients with 3–6 months after the procedure, were controlled after received the interventional treatment again. The 1-month patency rate was 100% (16/16), the 3 month and 6 month patency rate was 92.5% (15/16) and 81.3% (13/16).

Conclusion: As a new kind of palliative treatment, percutaneous intraductal radiofrequency ablation is safe and feasible for malignant biliary obstruction. The short-term outcome is satisfying, but randomness and prospective studies are needed to evaluate the long-term efficacy.

Keywords: Jaundice, Obstructive, Catheter ablation, Stents.

OP03-8
Impact of Type of Surgery on Survival Outcome in Patients with Early Gallbladder Cancer in the Era of Minimally Invasive Surgery: Oncologic Safety of Laparoscopic Surgery
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Background/Aims: Laparoscopic surgery has been widely accepted as a feasible and safe treatment modality in many cancers of the gastrointestinal tract. However, most guidelines on GBC regard laparoscopic surgery as a contraindication, even for early GBC. The aim of this study is to evaluate and compare recent surgical outcomes of laparoscopic and open surgery for T1 (a,b) gallbladder cancer (GBC) and to determine the optimal surgical strategy for T1 GBC.

Method: The study enrolled 197 patients with histopathologically proven T1 GBC and no history of other cancers who underwent surgery from 2000 to 2014 at three major tertiary referral hospitals with specialized biliary-pancreas pathologists and optimal pathologic handling protocols. Median follow-up was 56
months. The effects of depth of invasion and type of surgery on disease specific survival and recurrence patterns were investigated.

**Result:** Of the 197 patients, 124 (62.9%) underwent simple cholecystectomy, including 30 (15.2%) who underwent open cholecystectomy and 94 (47.7%) laparoscopic cholecystectomy. The remaining 67 (34.0%) patients underwent extended cholecystectomy. Five year disease specific survival rates were similar in patients in the simple cholecystectomy group who underwent open and laparoscopic cholecystectomy (100% vs. 97.6%, p = 0.543). Type of surgery had no effect on recurrence patterns.

**Conclusion:** Laparoscopic cholecystectomy should not be regarded as contraindicated in the management of early GBC. The advantages of laparoscopic over open surgery suggest that laparoscopic cholecystectomy should be considered for patients with suspected early (T1) GB cancer based on exact pathologic staging.

**Keywords:** T1 GB cancer, Laparoscopic cholecystectomy.

OP04-2

**Examination of Response for Irreversible Electroporation on Colon Cancer Cell Using Multiphoton Microscopy: Ex vivo Study**

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**Background:** Irreversible electroporation (IRE) is a promising novel technique for tumor ablation using energy current pulses. IRE can effectively remove unwanted cells without thermally damaging surrounding tissues. For reliable and quick assessment of the response to IRE ablation in colon cancer, we developed multiphoton (MP) probes for DNA (ABI-Nu) and mitochondria (PMT).

**Methods:** Colon cancer cell lines (HT-29) and normal colon mucosa and colon neoplasm tissues obtained during colonoscopic biopsy from 10 patients were stained with TP probes for mitochondria (PMT) and for DNA (ABI-Nu). We evaluated the feasibility of using multiphoton microscopy (MPM) to observe IRE responses. First, the responses of colon cancer cells and tissues to IRE were investigated using MPM. Electrical pulses were administered with a Harvard apparatus, and the changes in the intensity of the nucleus and mitochondria were observed over time. Second, to assess apoptosis, colon cancer cells were stained with the fluorescent dye Annexin V or propidium iodide (PI) after applying electroporation at the same energy used earlier.

**Results:** MPM images of cancer cells stained with MP probes revealed that ABN (Nu) stained quicker than PMT after IRE ablation. At the tissue level, nuclear staining was present earlier and was more prominent after IRE was applied. In addition, IRE showed a relatively stronger effect on cancer cells than on normal tissue. We obtained MPM images for each tissue slice at a depth of 90–150 μm along the z-direction. Using the same electroporation energy, staining was positive for Annexin V and PI, providing evidence of apoptosis.

**Conclusions:** Here, we observed using MPM that nuclear staining occurred quickly due to increased cell membrane permeability and bleb formation after electric pulse exposure. These results are expected to challenge the understanding of the permeability process after IRE by providing the real-time images. Additionally, MPM can replace other apoptosis assessment methods, including Annexin V-FITC and PI staining. This MP probe protocol dramatically increases the accuracy of diagnostic techniques by providing in vivo cell images.

**Keywords:** Irreversible electroporation, Multiphoton microscopy, Colon cancer cell.
OP04-3
The Effectiveness of Irreversible Electroporation in Human Colon Adenocarcinoma: Nude Mouse Animal Model

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Backgrounds: Irreversible electroporation (IRE) is a promising novel technique for the ablation of tumor. IRE has an advantage over other ablation technique in its mechanism to remove undesired cells by affecting the cell membrane without thermally destructing surrounding blood vessels, nerves. There have been recent concerns regarding the potential use of IRE as an ablative modality. The aim of this study was to evaluate the effectiveness of IRE ablation according to therapeutic method in colon cancer animal model.

Methods: Male nude mice (6 weeks old) were introduced. Caco2 cells (ATCC) were each visually injected into both flanks. We performed in vivo IRE procedures in the tumors of nude mouse model. Electrical pulses were applied to the tumor of nude mice using a DC generator at 1~2 kV/cm amplitude, 100~200 pulses, 100~300 μs length. A group received early ablation (0, 7 day) and the other group received continuous ablation (0, 7, 14, and 21 days). We compared the size of tumors between control and IRE ablation group.

Results: The size of IRE ablative tumors significantly decreased comparing with the control. (p = 0.005) But there was no significant difference between early ablation group and continuous ablation group. (p = 0.972) There was complete cell death within the IRE lesions without intervening live cells. Histologically, in each group, the IRE ablative tumors were nonviable, with a persistent tumor nodule replaced fibrosis. The tissue with H&E stain and Tunnel assay showed apoptotic cell death in the 1 days after IRE ablation. The tissues after 24 hr IRE ablation showed diffuse necrotic cell death.

Conclusions: The present study demonstrated that IRE ablated colon cancer tissue very effectively through the induction of cellular apoptosis in the early stage. This study suggests that IRE is the potential use of IRE in colon cancer.

Keywords: Irreversible electroporation, Colon cancer, Apoptosis.

OP04-4
The Role of EPO/EpoR Signaling Pathway in Colorectal Cancer, Review and Our Study Results

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Background: Colorectal cancer (CRC) is a heterogeneous disease with increasing incidence and is the third most common cancer worldwide. Anemia in malignant disease is often cured with recombinant erythropoietin (rHuEpo) which use is in doubt due to possible enhancing tumor progression.

Aim: The role of Epo/EpoR signaling pathway in CRC remains unclear and data from studies are inconclusive. The aim of our study was to contribute elucidating the role of Epo/EpoR system in CRC, comparing it with clinical data.

Methods: tissue samples of 150 colorectal cancers, 50 villous adenomas and 50 specimens of healthy mucosa were tested for microvascular density, Epo and EpoR expression using monoclonal antibodies anti CD31 Class II (DAKO). Quantitative analysis of gene expression was performed with quantitative PCR. Statistic analysis was done with program Statistica®. The level of significance in all analysis is P < 0.05.

Results: EPO was moderate expressed in carcinoma/adenoma tissues (87% and 86% respectively) versus 56% of healthy controls, EpoR was highly expressed in 25.5% of carcinoma samples, 20% in adenoma samples but in healthy controls 94%. CD31 was statistically significant higher in tissue samples of healthy persons (P < 0.001) and mean values of CD31 were also significantly higher in Dukes A tumors. The moderate expression of EPO was conducted with more local recidives and metastatic disease (P < 0.001). Increased Epo/EpoR level was found following progression of adenoma into adenocarcinoma but without difference regarding grade of tumor and stage of disease.

Conclusion: In our study Epo/EpoR expression is not a valid prognostic marker for CRC nor prognostic factor of progressing adenoma into adenocarcinoma.

Keywords: Colorectal cancer, Biomarkers, Epo, EpoR.

OP04-5
Serum Uric Acid Levels as a Prognostic Factor in Male Patients with Non-Metastatic Colorectal Cancer

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Objective: Uric acid may be a marker of oxidative stress, and can be act as an antioxidant or a prooxidant. The role of serum uric acid (SUA) in the prognostic impact of cancer is controversial. This study aimed to evaluate whether the preoperative SUA level is
associated with long-term outcomes in patients with colorectal cancer (CRC).

**Methods:** Between 2002 and 2010, 3,397 patients, who underwent curative surgical resection for non-metastatic CRC and had available SUA value, were included for this study. We analyzed the association between the overall survival (OS) and SUA level as quartile according to Sex, using log-rank test and Cox proportional-hazard regression to identify prognostic factors.

**Results:** Mean SUA level was different between male and female (male \(n = 2,123\): 5.336 ± 1.360, female \(n = 1,274\): 4.092 ± 1.171, \(p < 0.001\)). In female patients, there was no difference in OS according to SUA level. In male patients, SUA levels in the lowest quartile (<4.4 mg/dl) was associated with poor overall survival (5-year OS of SUA level <4.4 mg/dl vs. ≥4.4 mg/dl: 78.0% vs. 84.3%, \(p < 0.001\)). SUA level was an independently significant prognostic factor (HR 1.417, 95% CI 1.166–1.722, \(p < 0.001\)). In male patients, SUA levels in the lowest quartile range, 19–69. The estimation of NLR and PLR was based in various cancer. In this study, we aimed to evaluate the prognostic value of the NLR and PLR in patients with colorectal cancer (CRC).

**Methods:** Between August 1995 and December 2010, medical records from a total of 2,004 patients with CRC were retrospectively reviewed. The values of simple inflammatory markers including NLR and PLR in predicting the long-term outcomes of these patients were evaluated using by Kaplan-Meier curves and multivariate Cox regression models.

**Results:** The median follow-up duration was 42 months (interquartile range, 19–69). The estimation of NLR and PLR was based on the time of diagnosis. In multivariate Cox regression analysis, high NLR (≥2.6) [hazard ratio (HR) 2.251, 95% confidence interval (CI) 1.570–3.228, \(p < 0.001\)] and high PLR (≥155) [HR 1.473, 95% CI 1.019–2.128, \(p = 0.039\)] were independent factors predicting to poor overall survival (OS) in patients with CRC. And combined high NLR and high PLR was also an independent factor predicting to poor OS in patients with CRC [HR 2.316, 95% CI 1.529–3.508, \(p < 0.001\)].

**Conclusion:** In this study, we identified that high NLR (≥2.6), high PLR (≥155), and combined high NLR and high PLR are useful prognostic factors to predict to the poor OS in patients with CRC.

**Keywords:** Neutrophil to lymphocyte ratio, Platelet to lymphocyte ratio, Colorectal cancer.
OP04-8
Protective Effect of Ursodeoxycholic Acid against Chemotherapy-Induced Mucositis
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Background/Aims: Gastrointestinal mucositis is a serious side effect of chemotherapy. It increases the frequency of infection, risk of bleeding, and duration of hospitalization, consequently reducing subsequent chemotherapy doses. Ursodeoxycholic acid (UDCA), which is currently used in various liver diseases, exerts direct cytoprotective effects by stabilizing membranes, inhibiting apoptosis, and acting as an antioxidant. The protective effect of UDCA against chemotherapy-induced mucositis was assessed using an in vivo animal model.

Methods: Female Sprague-Dawley rats were randomly assigned to the following 5 groups: non-chemotherapy and vehicle; 5-fluorouracil (5-FU) and vehicle; 5-FU and 10 mg/kg/day UDCA; 5-FU and 100 mg/kg/day UDCA; and 5-FU and 500 mg/kg/day UDCA. 5-FU (400 mg/kg) or physiological saline (control) was administered by intraperitoneal injection. UDCA was orally administered 1 day before 5-FU injection for 6 days. One day after the final UDCA dose, rats were sacrificed, and the intestines were dissected for tissue sampling and laboratory analysis.

Results: UDCA promoted a higher body weight recovery, decreased villus destruction, and reduced inflammatory cytokines levels, at doses of 10 and 100 mg/kg/day. Villous fusion and destruction were pronounced in the 5-FU group compared with those observed in the UDCA-treated group or controls. The jejunal villous lengths were as follows: 212.8 ± 80.0 μm, 331.3 ± 18.0 μm, and 310.0 ± 112.6 μm, in the 5-FU and vehicle, 5-FU and 10 mg/kg UDCA (p < 0.006), and 5-FU and 100 mg/kg UDCA groups (p = 0.046), respectively. Real-time polymerase chain reaction (RT-PCR) showed that IL-6 and TNF-α levels decreased in the 10 mg/kg and 100 mg/kg UDCA co-administration groups. Further, myeloperoxidase activity decreased in the UDCA co-administration group.

Conclusions: UDCA significantly attenuated the reduction of the height of small intestinal villi and reduced inflammatory cytokine levels, thus highlighting the potential of UDCA as a preventive agent against chemotherapy-induced gastrointestinal mucositis.

Keywords: Ursodeoxycholic acid, Chemotherapy-induced gastrointestinal mucositis.
and perioperative predictors of PHLF were assessed for their correlation with and predictive value for PHLF using multivariate analysis. Internationally established PHLF criteria such as the 50–50, International Study Group of Liver Surgery (ISGLS) and Memorial Sloan Kettering Cancer Centre (MSKCC) criteria were used.

**Results:** The prevalence of PHLF in extensive hepatic resections was 7%, 41.4% and 28% for 50–50, ISGLS and MSKCC criteria respectively. Patients fulfilling the criteria for PHLF across all three criteria were at a higher risk for 30-day mortality as compared to patients who did not (27.3% vs. 3.4% in 50–50, 6.2% vs. 4.3% in ISGLS, 9.1% vs. 3.5% in MSKCC). Pre-operative parameters such as MELD score and serum bilirubin are predictive risk factors for PHLF. Pre-operative bile leakage (15.7% vs. 0% in 50–50, 45% vs. 41% in ISGLS, 29% vs. 27.8% in MSKCC). Model for End Stage Liver Disease (MELD) score was the strongest significant predictive factor for PHLF in the 50–50 criteria (OR 1.185, P = 0.0261). Pre-operative serum bilirubin was the strongest significant predictive factor for PHLF in both the ISGLS and MSKCC criteria (ISGLS: OR 1.46, 95% CI: 1.03–2.07, P = 0.033). In patients with HCC without severe liver fibrosis, serum HA levels were correlated with multiple tumours (P = 0.039), early recurrence (P = 0.033), and poor RFS (log-rank P < 0.001) and OS (log-rank P = 0.024).

**Conclusion:** High preoperative serum HA levels predicted poor prognosis in HCC patients after hepatic resection, and may serve as a future biomarker.

**Keywords:** Hyaluronic acid, Hepatocellular carcinoma, Prognosis.

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**OP05-2**

Preoperative Serum Hyaluronic Acid Level as a Prognostic Factor in Patients Undergoing Hepatic Resection for Hepatocellular Carcinoma

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**Background:** Hyaluronic acid (HA) plays a critical role in tumorigenesis. The clinical significance of serum HA levels in patients with hepatocellular carcinoma (HCC) remains to be elucidated. This study analysed the relationship between preoperative serum HA levels and prognosis after hepatic resection in patients with HCC.

**Methods:** Consecutive patients who underwent hepatic resection for HCC between September 1999 and March 2012 were included in this retrospective study. Serum HA levels were measured within 4 weeks prior to surgery by an immunoturbidimetric automated latex assay. The cutoff value of preoperative serum HA level was validated using a time-dependent receiver operating characteristic curve analysis. The prognostic association of preoperative serum HA levels was analysed using Cox proportional hazards analyses.

**Results:** A total of 506 patients were analysed. Median age was 66 years, and there were 405 male participants (80%). Median follow-up time was 32 months. High serum HA levels (≥100 ng/ml) were associated with poor recurrence-free survival (RFS) [log-rank P < 0.001; multivariable hazard ratio (HR): 1.50, 95% confidence interval (CI): 1.17–1.93, P = 0.002] and overall survival (OS) [log-rank P = 0.001; multivariable HR: 1.46, 95% CI: 1.03–2.07, P = 0.033]. In patients with HCC without severe liver fibrosis, serum HA levels were correlated with multiple tumours (P = 0.039), early recurrence (P = 0.033), and poor RFS (log-rank P < 0.001) and OS (log-rank P = 0.024).

**Conclusion:** High preoperative serum HA levels predicted poor prognosis in HCC patients after hepatic resection, and may serve as a future biomarker.

**Keywords:** Hyaluronic acid, Hepatocellular carcinoma, Prognosis.

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**OP05-3**

Correlation between Resection Margin and Disease Recurrence with a Restricted Cubic Spline Model in Patients with Resected Hepatocellular Carcinoma

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**Background:** Although the resection margin (RM) is an important principle of oncologic surgery, the relationship between RM and recurrence of resected hepatocellular carcinoma (HCC) is unclear.

**Methods:** We retrospectively reviewed the clinical data for 419 patients who underwent liver resection for HCC between January 2004 and January 2015 in a tertiary hospital. The risk of recurrence was plotted against RM using the restricted cubic spline (RCS) model. The perioperative and oncologic outcomes were compared between two groups of patients classified according to the inflexion point of the RCS plot.

**Results:** Because the risk of recurrence decreased sharply until an RM of 1 cm, the patients were divided according to an RM of <1 cm (n = 233; narrow RM group) or ≥1 cm (n = 186; wide RM group). Operation time (294 min vs. 265 min, P = 0.048), frequency of postoperative bile leakage (15.7% vs. 0%, P = 0.034), and frequency of cirrhotic liver (64.9% vs. 53.2%, P = 0.016) were significantly greater in the narrow RM group than in the wide RM group. The 3-year recurrence-free survival rate was lower in the narrow RM group (34.8% vs. 43.8%, P = 0.042) and recurrence near the resection site was more frequent in the narrow RM group (4.7% vs. 0%, P = 0.010). Multivariable analysis showed that RM <1 cm was a marginally significant prognostic factor for disease recurrence (hazard ratio 1.336, 95% confidence interval 0.985–1.811, P = 0.062). The adjusted RCS plot showed a stable risk of recurrence at an RM of 1 cm.

**Conclusion:** An RM of ≥1 cm is associated with lower risk of recurrence after liver resection in patients with HCC.

**Keywords:** Hepatocellular carcinoma, Recurrence, Resection margin, Restricted cubic spline.
Background/Aims: Whether the liver resection or radiofrequency ablation (RFA) should be the first-line treatment for very early/early hepatocellular carcinoma (HCC) in patients who are candidates for both remains a hot debate. Recently, minimally invasive surgery has been introduced in liver surgery. The outcome of minimally invasive hepatectomy (MH) and RFA needs reassessment and this is the aim of the present study.

Method: This is a retrospective analysis on patients who received MH and RFA for primary HCC from January 2005 to January 2015. Only patients with Barcelona Clinic Liver Cancer (BCLC) stage 0/A disease and only operations performed with minimally invasive approach (percutaneous, laparoscopic and robot-assisted) were included. Baseline clinical and laboratory parameters were retrieved and reviewed from the hospital database. Perioperative outcomes, overall and disease-free survivals were compared.

Results: A total of 225 patients underwent MH and RFA for primary HCC during the study period. Among them, 216 patients (59 patients received MH and 155 patients received RFA) were stage BCLC 0/A and eligible for the study. The median duration of follow-up was 47.2 (IQR = 27.0–72.3) months. Propensity score matching analysis was performed to minimize the potential bias in clinicopathological factors, which resulted in 59 pairs of patients/group. All patient, tumour and liver function factors were well balanced between two groups. There was no statistical difference in the complication rates and operative blood loss between two groups. There was no statistical difference in all survival rates than primary transplantation. MH provided significantly better overall and disease-free survival than RFA.

Conclusion: MH provides better long-term overall and disease-free survival compared with RFA in patients with BCLC very early/early-stage HCC without increase in the complication rate. If minimally invasive approach is feasible, MH should be considered as the first-line treatment for these patients.

Keywords: Barcelona clinic liver cancer (BCLC), Hepatectomy, Hepatocellular carcinoma, Prognosis, Radiofrequency ablation, Recurrence, Surgery, Survival, Minimally invasive surgery.

OP05-5

'Salvage Transplantation for Post Resection Recurrence in Hepatocellular Carcinoma Associated with Hepatitis C Virus Aetiology: A Feasible Strategy?' – Retrospective Analysis with Prognostic Factors

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Introduction: We analyzed the feasibility of salvage liver transplantation after liver resection in Hepatocellular carcinoma with HCV etiology.

Method: All the patients with HCC with HCV etiology who underwent living donor liver transplant from July 2002 to November 2012 were studied. Their recurrence rate, mortality, and prognostic factors were analyzed and compared between primary transplant and salvage transplant.

Results: One hundred and nine patients underwent liver transplant for hepatocellular carcinoma associated with HCV etiology within the University of California, San Francisco (UCSF) criteria. 18 were post hepatectomy salvage transplants and 91 were primary transplants. Median follow-up time was 31 months. One, three and five years recurrence free survivals were 72%, 72%, 46% for salvage group and 91%, 73%, 46% for primary transplant group which were not statistically significant (p = 0.328). One, three and five years overall survival rates were 76%, 76% and 65% in salvage group and 92%, 85% and 85% in primary transplant group respectively. The difference in overall survival rates was statistically significant (p = 0.031).

Conclusion: Salvage transplantation for post hepatectomy recurrence for patients with Hepatocellular carcinoma associated with HCV related chronic liver disease seems to offer inferior overall survival rates than primary transplantation.

Keywords: Hepatocellular carcinoma, HCC, HCV, Salvage transplantation, Hepatitis C virus.
**Method:** We retrospectively reviewed 469 hepatocellular carcinoma patients who underwent liver resection between 1 January 2004 and 30 June 2015. We compared performance of both classifications for predicting power of perioperative outcomes using receiver operating characteristic curve analysis.

**Results:** Both classification effectively differentiated subgroups in terms of intraoperative findings and short-term outcomes in terms of blood loss, transfusion rate, operation time, complication rate, postoperative hospital stay ($P < 0.001$, respectively). There were disagreements in 77 (22.2%) of 347 patients in minor classification including medium ($n = 64$) and high complexity ($n = 13$). The complexity classification correlated with predicting blood loss (Area under the curve [AUC] = 0.690 and 0.617, respectively; $P = 0.001$) and operation time (AUC = 0.727 and 0.619, respectively; $P < 0.001$) better than the major/minor classification.

**Conclusion:** The complexity classification outperformed the major/minor classification to predict surgical difficulty.

**Keywords:** Hepatectomy, Difficulty, Outcome, Complication.

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**OP05-8**

**Laparoscopic Liver Resection for Hepatocellular Carcinoma Located in Segment 7 or 8**

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**Background:** Laparoscopic liver resection (LLR) for hepatocellular carcinoma (HCC) located in the posterior-superior segments was reported as contraindication or difficult and segment 7 or 8 is considered as unfavorable location for LLR.

**Methods:** This retrospective study included 119 patients who underwent LLR or open liver resection (OLR) for HCC located in segment 7 or 8 between October 2004 and June 2015. The patients were divided into two groups; LLR group ($n = 58$) and OLR group ($n = 61$) according to the type of operation.

**Results:** There were no significant differences of preoperative patients’ characteristics between two groups. The LLR group showed more non-anatomic liver resection (60.3% and 27.9%, respectively; $P < 0.001$) compared with the OLR group. In the LLR group, the operative time (391.0 ± 191.7) was significantly longer than that in OLR group (313.7 ± 102.7; $P = 0.008$). There were no significant differences in variables of blood loss (1512 ± 2795 and 1066.3 ± 1234.6; $p = 0.274$), blood transfusion (29.3% and 23%; $p = 0.429$), hospital stay (14.5 ± 23.27 and 13.0 ± 9.746; $p = 0.670$), post-operative complication (22.4% and 32.8%; $p = 0.206$), severity of complications according to Clavien-Dindo grade (13.8% and 19.7%; $p = 0.309$) and resection margin (9.52 ± 8.30 and 9.19 ± 7.84; $p = 0.824$).

**Conclusion:** LLR for HCC located in segment 7 or 8 can be safely performed.

**Keywords:** Hepatectomy, Postero-superior, Laparoscopy, Segmentectomy.

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**OP05-7**

**Laparoscopic Liver Resection for Hepatocellular Carcinoma Located in Segment 7 or 8**

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**Background:** ALPPS has been introduced as a novel approach to induce liver hypertrophy in patients with insufficient future liver remnant (FLR) contemplating for major hepatectomy in colorectal liver metastasis. Our aim was to evaluate the suitability and outcome of ALPPS for hepatitis-related HCC when compared with portal vein embolization (PVE).

**Methods:** Patients with Child A cirrhosis and FLR <35% of estimated total liver volume (ESLV) were selected for ALPPS. In-situ split was performed by anterior approach in stage I. Portal haemodynamics were studied intraoperatively. No bag nor drain was placed in stage I. Postoperative outcomes were compared with PVE matched for age, liver function and tumor characteristics.

**Results:** From October 2013 to May 2016, 29 patients with a median age of 60 (hepatitis B, $n = 28$; hepatitis C, $n = 1$) underwent ALPPS. The tumor size was 8.6 cm (1.3–17.0 cm). Preoperative FLR was 313.0 ml and the median FLR/ESLV was 26.1% with an ICG value at 15 minutes of 11.3%. Portal flow to FLR increased from 200.0 ml/min to 542.5 ml/min after portal vein ligation, and subsequently to 737.5 ml/min after in-situ split. As a result, FLR volume increased by 50.7% after 6 days with an FLR of 498.3 ml and FLR/ESLV of 38.5%. All patients proceeded to stage II operations (right trisectionectomy, $n = 4$; extended right hepatectomy, $n = 10$, right hepatectomy $n = 15$) without inter-stage complications. ALPPS induced greater FLR hypertrophy than PVE (daily FLR gain: 7.0% vs. 0.8%; $p < 0.001$) without increased morbidity (10.3% vs. 32.1%) and mortality (6.9% vs. 7.1%; $p = 1.000$). The 1-year tumor recurrence rate for ALPPS and PVE were similar (TNM I/II: 0% vs. 20.5%; TNM III: 53.8% vs. 52.2%, respectively).

**Conclusion:** ALPPS induced FLR hypertrophy in chronic liver disease by substantial flow augmentation with similar oncological outcome as PVE. The entire course of treatment could be completed in a timely manner within one hospitalization.

**Keywords:** ALPPS, Hepatocellular carcinoma, Hepatitis, Hoc, Associating liver partition and portal vein ligation for staged hepatectomy.
OP05-9

Assessment of Hepatocellular Carcinoma Based on the Liver Cancer Study Group of Japan (LCSGJ) and the American Joint Committee on Cancer (AJCC)/International Union against Cancer (UICC) TNM Staging System

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Backgrounds/Aims: We present the result of AJCC/UICC TNM staging and LCSGJ, and validate the two systems in patients with HCC at Ajou University Medical Center.

Method: We collected data of 827 patients with HCC who underwent hepatic resection from April 1994 to Dec 2013. Survival curves and prognostic factors for survival were evaluated using the Kaplan-Meier method and Cox's regression.

Result: In the multivariable Cox's regression, hepatic vein invasion was the most significant factor for disease free survival (DFS), followed by intrahepatic metastasis, and microvascular invasion. For overall survival (OS), serum albumin had the greatest impact, followed by intrahepatic metastasis, microvascular invasion and close margin (less than 1 cm). Based on LCSGJ, 5-year DFS of T1 was 49.5%, T2 was 48.3%, T3 was 34.8%, T4 was 7.5%, and it should mean that DFS between T1 and T2 was not significantly different. For 5-year OS, T1 was 87.9%, T2 was 72.0%, T3 was 51.2%, and T4 was 19.9% (p < 0.001). Based on AJCC/UICC, 5-year DFS of stage I was 52.5%, stage II was 40.9%, stage III was 26.0%, stage IV was 31.3%, and it should mean that DFS between stage I and stage II was not significantly different. For 5-year OS, stage I was 76.1%, stage II was 52.0%, stage III was 29.1%, stage IV was 42.7%, and it should also mean that OS between stage III and stage IV was not significantly different.

Conclusion: We think our findings supports LCSGJ staging is more appropriate for stratifying patients with HCC, although DFS between early stages was not significantly different. We believe it would be needed in order to analyze the LCSGJ staging systems furtherly that we subdivided T1 or T2 in LCSGJ with some variables such as serum albumin level or hepatic vein invasion.

Keywords: Hepatocellular carcinoma, Survival, Prognostic factor.

OP06-1

The Development of Novel Endoscopic Device Using Curved Needle for Full Thickness Suture: Ex vivo Animal Study

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Background/Aims: Nonsurgical endoscopic closure of the gastrointestinal wall may be desired in many situations, such as fistulae, perforation. With the emerging and development of natural orifice transluminal endoscopic surgery (NOTES) as a minimally invasive surgical platform, endoscopic suturing is especially important. Here, we studied the feasibility of new developed endoscopic suturing device by demonstrating the strength of closure in ex vivo animal study.

Method: A total of 30 porcine stomachs were used for the test. Standard gastrotomy was made on each stomach by blade incision. Porcine stomachs were assigned randomly to 3 groups and closed by new endoscopic closer with curved needle (En-closer), endoscopic clips and hand sewn. Each stomach was inflated by an automated pressure gauge. After that, the stomach was dipped in water and air leakage pressure was measured by automated pressure gauge when an air bubble was first observed.

Result: The average leakage pressure for the En-closer, Endoclip, and full-thickness hand sutures was 43.25 mm Hg, 44.10 mm Hg, and 63.19 mm Hg. The average closer strength of the En-closer does not significantly differ from that of the Endoclip (p > 0.05). The standard deviation for the En-closer, Endoclip, and full-thickness hand sutures was 6.37 mm Hg, 14.35 mm Hg, and 12.97 mm Hg, respectively. The standard deviation of the En-closer is significantly smaller than that of the Endoclip and full-thickness hand sutures (P < 0.05). It is determined that the closer strength of the En-closer does not significantly differ, but is more consistent than the closer strength of the Endoclip.

Conclusion: The En-closer, which can performs multiple stitches with a single endoscope insertion showed feasible result comparing with Endoclip and hand-sewn suture. This research proposes a novel approach for minimally invasive endoscopic surgery.

Keywords: Endoscopic suture, Endoscopic device.
**OP06-2**

**Healing of Chronic Gastric Ulcers That Have a Poor Regeneration in Case of Local Injection of Platelet-Rich Plasma**

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**Background/Aims:** The aim of study was to estimate efficiency of local injection of platelet-rich plasma in patients with chronic gastric ulcers that have a poor regeneration.

**Method:** The 50 patients with chronic gastric ulcers that have a poor regeneration were included into study. In this cohort of patients there were 22 (44.0%) women and 28 (56.0%) men. An average age of patients was 46.9 ± 10.4 years.

Inclusion criteria were age older than 18 years; diagnosis of chronic gastric ulcers that have a poor regeneration (absence of positive changes after 12 weeks of anti-ulcer therapy), which was confirmed by endoscopy and histological review; absence of signs of malignancy; size of ulcer – 1–3 cm; absence of clinically significant concomitant diseases.

The 23 patients were included into main group (standard anti-ulcer therapy and endoscopic injection of platelet-rich plasma). The group of comparison consisted of 27 patients (standard anti-ulcer therapy only).

On 1st, 7th and 14th day endoscopy with biopsy and measurement of the ulcers square was performed.

**Result:** The data we have received demonstrate a tendency of decrease of ulcers’ square in main group as well as in group of comparison (p < 0.01) with time flow.

We also compared sizes of ulcerative defects in both groups at every point of the study. On the 1st day of investigation there were no differences (p > 0.05) between ulcers’ square in both groups. On the 7th day we found out more rapid decrease of size in main group (p > 0.05). However, this tendency had no statistical significance. On the 14th day difference was larger and it was statistically significant this time (p < 0.01).

**Conclusion:** Unitary local endoscopic injection of platelet-rich plasma on the background of anti-ulcer therapy permits to accelerate a process of the ulcerative defects epithelization significantly (p < 0.01) during 14 days.

**Keywords:** Chronic gastric ulcer, Poor regeneration, Healing, Endoscopic injection, Platelet-rich plasma.

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**OP06-3**

**The Usefulness of the OrVil Method and Liver Mobilization for Optimal Surgical Field in LATG**

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**Background/Aims:** There are many difficulties concerning esophago-jejunostomy in LATG. We use the OrVil methods in anastomosis. The purpose of this study is to examine the usefulness of the OrVil method. Furthermore we will show the procedure of the surgical technique in liver mobilization for optimal surgical field.

The falciform ligament was divided from the edge of the liver to near the hepatic vein. Pars flaccida of the hepatogastric ligament was divided up to the right of the esophageal crus. Next, the coronary and triangular ligaments were divided. An organ retractor with two hooks attached and the hooks were placed in two portions of the diaphragm.

**Method:** Sixty patients were divided in two groups (Liner group: 30 and OrVil group: 30) Operative time and intraoperative bleeding, post-operative complication were compared with two groups.

**Result:** Operative time was shorter in OrVil group than Liner group (387 min vs. 322 min).

And anastomosis time was significantly shorte in OrVil group than Liner group (45 min vs 16 min p < 0.05). In intraoperative bleeding, there was no significant difference between two groups. In complication concerning anastomosis, one minor leakage was happened in Liner group and two stenoses were happened in Or-Vil group.

Liver mobilization was performed within 15 min, and concerning the hepatic function testing, there was no significant difference compared with non-mobilized group.

**Conclusion:** OrVil method is performed easily and safety, and live mobilization make the optical surgical filed.

**Keywords:** LATG OrVil liver mobilization.

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**OP06-4**

**Endoscopy Guided Da Vinci® Robotic Gastric Surgery for Early Gastric Cancer**

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**Background:** Endoscopic resection has been an optimal treatment for selected patients with early gastric cancer (EGC) based on advances in endoscopic instruments and techniques. This study aims to evaluate the result of endoscopy guided da Vinci® Robotic full-thickness gastric resection (ERFTGR) with sentinel lymph node basin dissection (SLND) under indocyanine green and infrared in cases of EGC with high risk of lymph node metastasis.

**Method:** This was a prospective, pilot study at a single academic center. Of 70 patients with EGC, 12 met the following criteria:
1) differentiated mucosal/submucosal cancer with an ulcer, between 3 and 4 cm by endoscopic imaging; 2) undifferentiated mucosal/submucosal cancer without an ulcer, between 2 and 3 cm by endoscopic imaging; 3) patients who had undergone previous ESD whose pathological reports recommended an additional gastrectomy due to a risk for LNM. The main outcome measure was technical success.

**Results:** All cases were resected en bloc with negative surgical margins. Previous forceps biopsy results revealed that 7 cases were undifferentiated adenocarcinoma. Three of the 10 cases were suspected submucosal cancer by endoscopic and EUS findings. The other 2 cases that had undergone previous ESD whose pathological reports recommended an additional gastrectomy due to positive vertical margin. After ERTFGR with SLND, 2 patients were observed lymph node metastasis and were underwent standard gastrectomy. ERTFGR with SLND was conducted without perioperative adverse events.

**Conclusion:** ERTFGR with SLND could be a bridge between ESD and conventional gastrectomy with respect to preventing an extensive gastrectomy in patients with EGC.

**Keywords:** Early gastric cancer, Endoscopy fluided da vinci® robotic gastric surgery, Sentinel lymph node dissection.

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**OP06-5**

**Intracorporeal Esophagojejunosotomy Using the Hemi-Double Stapling Technique (HDST) after Laparoscopic Total Gastrectomy in Patients with Gastric Cancer**

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**Introduction:** Esophagojejunosotomy during TG is recognized as the most critical and technically challenging part of the operation. Till now, various methods for anastomosis are reported and the procedure of choice for esophagojejunosotomy remains to be established.

**Method:** A retrospective case-series study between July 2010 and December 2014, 58 consecutive patients with gastric cancer underwent laparoscopic-assisted total gastrectomy (LATG) in Seoul St. Mary’s hospital were enrolled for the study with (HDST).

**Results:** The mean overall total operation including reconstruction and anvil insertion times were 199.8 ± 57.0 min. Intraoperative blood loss was 81.6 ± 56.3 ml and there was no open conversion. Splenectomy was needed initially in only 2 patients (3.4%). The postoperative complications divided to EJ anastomosis site and non-EJ anastomosis site. In EJ site was 5 (8.6%) cases of the leak were all controlled successfully by an endoscopic stent, 3 (5.1%) cases of anastomosis stricture were treated all successfully by endoscopic intervention except for 1 (1.7%) case needed surgical intervention. A-loop partial obstruction was encountered in 3 (5.1%) cases were treated conservatively, 1 (1.7%) case of A-loop bleeding was treated conservatively as well. Non-EJ site complication in the majority was chest related complications i.e. pneumonia in 3 (5.1%) cases, pleural effusion in 4 (6.8%) cases, pancreatitis in 2 (3.4%) cases, splenic bleeding in 1 case necessitated splenectomy to control bleeding. The intra-abdominal fluid collection was in 6 (10.3%) cases, wound infection in 2 (3.4%) case, wound disruption in 1 (1.7%) cases, ileus in 5 (8.6%) cases, and trocar site hematoma in 1 (1.7%) case. The patients hospital stay at a mean of 9.6 ± 2 days. The mean proximal margin of the specimen was 2.7 ± 1.8 cm.

**Conclusion:** Roux-en Y esophagojejunosotomy using a method of a circular hemi-double staple technique is simple, safe and rapid. It may offer a solid, alternative reconstruction method in totally gastrectomized patients.

**Keywords:** Intracorporeal esophagojejunosotomy, Hemi-double stapling technique, Laparoscopic total gastrectomy, Gastric cancer, Feasibility.

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**OP06-6**

**Safety of Duodenal Stump Closure Using PGA-Reinforced Tri-Staple in Gastrectomy for Gastric Cancer, A Prospective Multicenter Registration Study**

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**Background:** Duodenal stump fistula (DSF) is infrequent but one of the most severe complications after gastrectomy for gastric cancer due to its high mortality rate. Therefore, appropriate duodenal closure is essential during gastrectomy, irrespective of surgical approach.

**Methods:** This trial evaluated the safety of PGA-reinforced tri-staple for gastrectomy in terms of DSF. Primary endpoint was incidence of DSF. The sample size was calculated to be 100, providing an 80% power with a one-sided alpha of 5%, under the hypothesis of a primary endpoint with an expected value of 3% and a threshold value of 8%. Postoperative complications were evaluated by Clavien-Dindo classification.

**Results:** A total of 100 patients underwent total or distal gastrectomy with R-Y reconstruction from June 2014 to February 2015. All patients received duodenal stump closure using 60 mm purple cartridge (for thick tissue) as planned preoperatively. The mean age of the patients was 66.5 years old, and the male to female ratio was 2.3. Approach of surgery was laparotomy in 56 patients and laparoscopy in 44. Sixty-one patients received total gastrectomy and 39 underwent distal gastrectomy. Reconstruction was Roux-en Y in all patients. Morbidity of >G2 and >G3 was observed in 23 and 3 patients, respectively. DSF was found in 2 patients (2%); G2 in 1 and G3b in 1. Both had occurred secondary to pancreatic fistula on POD 19 and 13, respectively.

**Conclusion:** PGA-reinforced tri-staple could be safely applicable for duodenal stump closure either in laparoscopic or open gastrectomy.

**Keywords:** Duodenal stump closure, PGA, Reinforced staple, Gastrectomy, Gastric cancer.
OP06-7
Intraoperative Identification of Resection Margin Using Magnifying Narrow Band Imaging Technique after Gastrectomy for Gastric Cancer
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Purpose: As the incidence of early gastric cancer (EGC) and totally laparoscopic function-preserving surgery has increased, so has the importance of identifying resection margin. Magnifying narrow band imaging (M-NBI) is known to be excellent for identifying entire margin of EGC in vivo, thus it may allow reliable delineation of tumor in the specimen after gastrectomy. The usefulness of intraoperative identifying resection margin using M-NBI was evaluated.

Methods: 28 patients with preoperative EGC were enrolled prospectively to this study. After partial excision of the specimen for an intraoperative frozen biopsy, the proximal and distal resection margins were identified using GIF-HQ190 endoscopy (Olympus Medical Systems) and marked with electrocauterization. The histopathologic results of resection margins and microvessel density (MVD) were examined by a pathologist.

Results: Twenty five were T1 tumors and three were T2 tumor. Thirteen showed undifferentiated histopathologic features. Free resection margins were obtained in all cases and the tumor was successfully delineated in 26 cases (92.8%); however it was failed in two patients with signet ring cell carcinoma. In M-NBI findings, change of fine mucosal surface were observed in 25 cases (89.3%), heterogeneity in shape in 24 cases (85.7%), and tortuosity of vessel in 9 cases (32.1%). The mean discrepancy of the measured tumor size between M-NBI and pathology was 0.09 ± 0.48 cm. The mean MVDs of tumor and normal tissue were 25.7 and 27.5; differentiated tumor showed higher MVDs of tumor than those of undifferentiated tumor (30.1 vs. 22.1, p = 0.047).

Conclusion: M-NBI is a good modality for intraoperative identification of resection margin after gastrectomy for clincial EGC.

Keywords: Gastric cancer, Resection margin, Narrow band imaging.

OP06-8
The Mechanism Underling Diet Recovery after Gastrectomy Is the Small Bowel Adaptation Rather Than Distension of the Remnant Stomach
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Introduction: After gastrectomy, the volumes of the remnant stomach decreased 30% to 50% more than before the operation in gastric cancer patients, but the volume of diet recovered about more than 67.5%–80% after 6–12 months later. The aim of this study was to investigate of the mechanism underlying diet recovery after gastrectomy.

Materials and Methods: We prospectively collected clinical data and CT volumetric data from 80 consecutive patients with gastric cancer who underwent radical subtotal gastrectomy along with Billroth II reconstruction. Among the previous questionnaire survey group, we prospectively enrolled 26 patients. They underwent the remnant gastric volume and transit time using the following barium upper gastrointestinal and small bowel series.

Results: The means of the diet amount were 31.5%, 63.8%, 72.8%, 81.7%, and 81.4% in post-operative month (POM) 1, 3, 6, 12, and 24, respectively, than before the operation (p < 0.05). In CT volumetry, the means of stomach volumes were decreased from preoperation (670 ml) to POM 6 (130.2 ml), POM 12 (84.2 ml) and POM 24 (83.6 ml), (p < 0.05).

In the UGI study, we found that the mean anterior-posterior surface areas of the remnant stomach decreased to 46.4 ± 19.9 cm² in 1POM, to 50.1 ± 20.8 cm² in 3POM, to 42.3 ± 17.5 cm² in 6POM, and to 41.7 ± 14.3 cm² in 12POM (p > 0.05). We found that the small bowel transit times were decreased to 134.8 ± 64.2 min in 1POM, to 124.9 ± 48.6 min in 3 POM, to 126.8 ± 44.6 min in 6 POM to 96.0 ± 32.8 min in 12POM (p < 0.05).

Conclusion: We found that patients who underwent subtotal gastrectomy reached the 80% of diet intake than before the operation in post-operative 1 year. It is concluded that the mechanism underlying diet recovery after gastrectomy may be the adaptation of small bowel motility rather than distension of the remnant stomach.

Keywords: Gastrectomy, Gastrointestinal motility, Quality of life.
A 67-year-old male with a long history of alcohol consumption and smoking was admitted for epigastric pain. Esophagogastroduodenoscopic examination disclosed the 6 cm sized circumferential early stage squamous cell carcinoma in the middle intrathoracic esophagus. For early-stage esophageal cancer deviating from the mucosal invasion, esophagectomy with lymph node dissection is performed for potential risk of lymph node metastasis. However, the patient refused to undergo surgical resection. To avoid lymph node metastasis, we performed endoscopic submucosal dissection (ESD) using tunnel method with thoracoscopic mediastinal lymph node dissection. Pathological ESD specimens disclosed a squamous cell carcinoma, and no evidence of submucosal invasion or lymphatic metastasis.

**Keywords:** Endoscopic submucosal dissection using tunnel method, Thoracoscopic mediastinal lymph node dissection, Early-stage esophageal cancer.

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**OP07-1**

**Endoscopic Ampullectomy vs. Transduodenal Ampullectomy; Which Is the Best Choice?**

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**Background/Aims:** As current development of endoscopic procedure, endoscopic ampullectomy is performed more frequently in ampulla of Vater tumor. This study aimed to compare the outcomes and features of endoscopic resection and transduodenal ampullectomy in treatment of the ampulla of Vater tumor.

**Methods:** Retrospective review of 44 patients who underwent endoscopic resection and 19 patients treated by transduodenal ampullectomy for ampillary tumor. Pre- and post-procedure diagnostic biopsy studies were reviewed. Postoperative complications and recurrence were also recorded.

**Results:** Preoperative biopsy had concordance with final pathology in 84.1% (37/44) of endoscopic ampullectomy group. 7 patients with precancerous pathology were performed additional argon plasma coagulation or reampullectomy. Interestingly, the size of 7 patients without pathologic concordance (mean size = 1.94 cm) was greater than that of 37 patients with concordance (mean size = 1.42 cm). By comparison, preoperative biopsy had concordance with final pathology in 78.9% (15/19) of transduodenal ampullectomy group. 4 patients with low grade dysplasia and tubular component pathology might be curable by endoscopic resection. After endoscopic ampullectomy (median followup = 16 months), recurrences were identified in sixteen patients (8%). Incomplete resection group (5/11) showed higher recurrent rate than in complete group (11/33), but it was not significant (P = 0.474). The resected tumor size were no significant difference between recurrent group (mean size = 1.60 ± 0.82 cm) and non-recurrent group (mean size = 1.46 ± 0.87 cm) (P = 0.601). In transduodenal ampullectomy group, only one patient (tubular adenoma, low grade dysplasia) experienced recurrence. The pathologic result of confirming recurrence was also tubular adenoma with low grade dysplasia. 29% of endoscopic treated patients (n = 13/44) had a complication while only one patients (n = 1/19, 5%) in surgical group.

**Conclusion:** Endoscopic ampullectomy is an effective procedure for the curable resection of ampullary tumors. But, the choice of treatment modality is difficult since the possibility of undertreatment. So, pre- and post-evaluation including pathologic study should be performed cautiously for complete resection. In complications, endoscopic resection is not superior than transduodenal resection.

**Keywords:** Endoscopic ampullectomy, Ampullary tumor, Transduodenal ampullectomy.

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**OP07-2**

**Local Biliary Temperature and Bile Duct Damage in Catheter Radiofrequency Ablation of ex-vivo Porcine Liver**

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**Objective:** To explore the changes of local biliary temperature and bile duct damage after catheter radiofrequency ablation (RFA) in ex-vivo porcine liver under different power parameters.

**Methods:** Ten fresh ex-vivo porcine bile duct systems (gall-bladder and common bile duct preserved) filled with human bile were injected with contrast agent under DSA. Then, the RFA catheter (HabibTM EndoHPB) was inserted into the hilar biliary through the common bile duct. Ten groups of ablation parameters were conducted, i.e. 5 W (120s), 6 W (120s), 7 W (120s), 8 W (120s), 9 W (120s), 10 W (120s), 11 W (120 s), 12 W (120s), 13 W (120s), 14 W (120s), the temperatures of distal radiofrequency pole and 1.2 cm away from the pole were examined with temperature needles respectively under fluoroscopy. Pathology examinations were performed for evaluated damage of biliary and adjacent tissue.

**Results:** After modeling on ex-vivo porcine liver filling with human bile, ten liver bile ducts were successfully ablated. The temperatures of ablation area were found to be gradually increasing with higher power (up to 90.3°C), while the temperatures of the other two sites were not rising obviously (28.4–40.2°C). Coagulation necrosis of the ablation bile duct area were observed, and no significant damage was detected in the bile duct and liver tissues which were 1, 2 cm away from the ablation area.

**Conclusion:** The temperature of adjacent biliary slight rise without significant damage. Therefore, little effect of adjacent
non-ablation biliary and liver tissue could be caused by bile heat conduction.

**Keywords:** Catheter ablation, Porcine liver, Bile duct.

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**OP07-3**

### Comparative Study of the Efficacy of Stent Implantation and Percutaneous Endobiliary Radiofrequency Ablation Combined with Stent

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**Objective:** To compare the efficacy and stent patency between stent implantation and percutaneous endobiliary RFA combined with SEMS implantation in the treatment of malignant biliary obstruction (MBO).

**Methods:** A prospective study of percutaneous endobiliary RFA combined with SEMS for MBO at Navy General Hospital in the period between March 2014 and March 2015 was conducted. A total of 10 patients with MBO were obtained, and all received percutaneous endobiliary RFA combined with SEMS implantation. Then a retrospective study of SEMS placed for MBO in the period between June 2012 and December 2013 was conducted. A total of 15 patients were enrolled and SEMS implantation were performed. The serum TBIL, DBIL, ALT and γ-GT preoperative and a week after procedures were compared between the two groups. Stent patency were compared at 3, 6, 9 and 12 months follow-up.

**Result:** No significant difference of age, sex, primary disease and the level of preoperative serum TBIL, DBIL, ALT and γ-GT between the two groups of patients were found (p > 0.05). The stent patency rate of SEMS group were 86.7%, 46.7%, 33.3% and 20% respectively after 3, 6, 9 and 12 months follow-up, while the other group got stent patency rate as follows: 90%, 80%, 80% and 70%. No statistic difference of stent patency rate between the two group were obtained (c² = 0.063, p = 1.00; c² = 2.778, p = 0.211) after three and six months follow-up. However, statistic difference of stent patency rate between the two group were obtained (c² = 5.235, p = 0.041; c² = 6.250, p = 0.034) after nine and twelve months follow-up.

**Conclusion:** Compared with SEMS placement, a higher long-term stent patency rate can be obtained under endobiliary RFA combined with SEMS placement.

**Keywords:** Endobiliary radiofrequency ablation, Stent implantation, Malignant biliary obstruction, Jaundice.

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**OP07-4**

### Recurrence Patterns of Curative Resected Ampulla of Vater Cancer: Significance of Lymph Node Dissection Around Superior Mesentery Artery

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**Background/Aims:** Ampulla of Vater (AoV) cancer have better prognosis than other peri-ampullary cancers. However, prognosis of AoV cancer is different according to the stage, so it is necessary to establish treatment guideline according to the stage. The aim of this study was to figure out recurrence patterns of AoV ca. according to the stage and to suggest optimal treatment on AoV cancer.

**Methods:** From January 2000 to June 2012, 259 patients who underwent pancreaticoduodenectomy (PD) with R0 resection due to AoV cancer in Seoul National University Hospital were analyzed. Pylorus preserving PD (PPPD) was preferred, and lymph node (LN) dissection was performed around right side of superior mesenteric artery (SMA) and celiac axis. Survival and recurrence pattern was analyzed and its risk factors were explored.

**Results:** The mean age of total patients was 61.7 years and male to female ratio was 53:47. The median follow up duration was 40.7 month (range: 6–171) and 5-yeardiseasefree survival rate of total patients was 62.1%. Recurrence was occurred in 89 cases (34.4%). The most common recurrence site was liver (n = 52) in systemic recurrence (SR) and SMA LN in local recurrence (LR) (n = 21). The risk factors of recurrence were poorly differentiated pathology (p = 0.002), advanced T stage (0.032) and LN metastasis (p = 0.010). Early T stage had a tendency of LR especially around SMA, on the other hands, SR was developed in advanced T stage (p = 0.003). In above T2 stage, chemo therapy (CTx.) reduced recurrence, statistical insignificantly (p = 0.072). In LN metastasis group, radio therapy (RTx.) reduced recurrence significantly (p = 0.028), especially LR (p = 0.005).

**Conclusion:** Recurrence of T1 stage of AoV cancer was LR especially SMA area LN. It need to be considered to dissect LN around SMA area. In above T2 stage recurrence was developed SR, therefore, adjuvant therapy need to be considered.

**Keywords:** Ampulla of vater, Pancreaticoduodenectomy, Recurrence, Lymph node, Adjuvant treatment.


**OP07-5**

**A Double Blind Evaluation of Subdiaphragmatic Pre-Emptive Lidocaine Instillation to Control Postoperative Pain and Hemodynamic Change in Laparoscopic Cholecystectomy**

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One third of our patients still need opioids after laparoscopic cholecystectomy (LC) and hemodynamic changes (systemic vascular resistance: SVR↑, cardiac index: CI↓, blood pressure: BP↑ etc) induced by CO2 pneumoperitoneum during LC can cause serious problems in patients with advanced cardiopulmonary disease. We designed this study to evaluate the efficacy of pre-emptive subdiaphragmatic lidocaine instillation in postoperative pain and hemodynamic changes during LC.

**Methods:** Twenty patients (25–65 years old) were enrolled in this study with informed consent and protocol was designed with prospective, randomized, double blind method. Patients with cardiopulmonary disease (hypertension, COPD etc) were excluded. Ten minutes before CO2 pneumoperitoneum, control group received normal saline 200 cc and lidocaine group received 0.2% lidocaine 200 cc in both subdiaphragmatic space (150 cc in right side, 50 cc in left side). Hemodynamic changes (SVR, BP, CI etc) were monitored every 5 minutes during LC with NICO system. Postoperative pain were monitored 1, 3, 6, 12, 18 and 24 hours after LC with visual analogue and numerical pain scale. We also observed adverse effects (nausea, vomiting, shoulder pain and bowel movement, etc).

**Results:** Pre-emptive lidocaine instillation attenuates adverse hemodynamic effects of CO2 pneumoperitoneum. In lidocaine group, systolic blood pressure and SVR were lower but CI was higher than those observed in control group (data at 25, 30 minutes after CO2 pneumoperitoneum were statistically significant, P < 0.05). Pre-emptive lidocaine instillation also minimized the postoperative pain especially 1 and 3 hours after LC (p < 0.05). No significant side effect was observed after lidocaine instillation. Nausea, vomiting and return of bowel movement were not significantly different between two groups.

**Conclusion:** Pre-emptive subdiaphragmatic lidocaine instillation before CO2 pneumoperitoneum induction may help the patients with advanced cardiopulmonary disease to attenuate the adverse hemodynamic effects and to have less pain in LC.

**Keywords:** Laparoscopic cholecystectomy, Pain, Hemodynamic change.


**OP07-6**

**The Efficacy of Perioperative Fluid Restriction for Postoperative Complications after Pancreatoduodenectomy**

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**Background/Aims:** Overload of intraoperative fluid had been often caused to subclinical edema in lungs and the other tissues followed by decreased tissue oxygenation. It results in increasing the postoperative complications including ileus and anastomosis leakage. Recently, Goal-directed fluid therapy (GDFT) has been developed, which may restrict and optimize intraoperative fluid volume. The aim of this study was to evaluate how GDFT affects postoperative complication after pancreatecoduodenectomy (PD).

**Method:** GDFT has been introduced since 2013 at Wakayama Medical University. Two hundred patients underwent PD were enrolled. One hundred patients were classified into liberal fluid management (LFM) group and 100 patients were classified into GDFT group. In this study, the following parameters to evaluate the edema of tissue were used; subtraction of thick of jejunal wall at the pancreateojunostomy, ventral wall and body trunk, which were measured between preoperative and postoperative (POD4) CT.

**Result:** Intraoperative fluid volume was significantly reduced in GDFT group compared to LFM group. There was no difference of the rate of overall complications between both groups (25% vs. 35%; P = 0.123), however, the rate of developing POPF grade B/C was significantly low in GDFT group (7% vs. 16%, P = 0.046). The difference of thick of jejunal wall and body trunk were significantly thinner in GDFT group than that in LFM group (+1.8 mm vs. +2.5 mm, P = 0.008; +0.6 mm vs. +7.8 mm, P=.001). The patients with POPF grade B/C tended to have a more difference of jejunal wall compared to the patients without POPF grade B/C (+3.3 mm vs +2.0 mm; P = 0.06), and the patients with overall complication significantly had a significant difference of ventral wall compared to those without complications (+7.5 mm vs +1.9 mm; P = 0.013).

**Conclusion:** The restricted fluid management by GDFT may reduce the complications including POPF by preventing the postoperative tissue edema.

**Keywords:** Intraoperative fluid restriction, Pancreatoduodenectomy, Postoperative complications.
Abstracts

OP07-7
The Clinical Verification of Our Criteria of Drain Removal after Pancreas Resection
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Aims: A criteria of early drain removal is demanded to manage drain appropriately. In this study, we had retrospectively verified our criteria of early drain removal to evaluate its efficacy.

Method: The consecutive 109 patients who underwent pancreatic surgery at our hospital during 2015 were analyzed. Our criteria for early drain removal is both amylase level of drainage fluid (dAMY) under 5000 U/I on postoperative day (POD) 1 and dAMY under 3000 U/I on POD 3. If criteria was satisfied, drain was promptly removed on POD 3. ISGPF grade B/C were considered as clinically relevant pancreatic fistula (cPF).

Results: cPF was developed in 11.9 percent of patients and median duration of drainage was 3 days. Negative predictive value (NPV) of our criteria was 96.3 percent (The rate of patients who did not develop cPF among patients who satisfied our criteria). A percutaneous abdominal drainage was required in 2.5 percent of patients after early drain removal. These results indicated efficacy and safeness of our criteria. Next, we calculated the cut-off values of dAMY on POD 1 and 3 by receiver operating characteristic analysis. It were 2844 U/I on POD 1 (Area under the curve: AUC 0.86) or 381 U/I on POD 3 (AUC 0.82). These cut-off values were different from reference values of our criteria. The reviewed data by using these cut-off values as hypothetical criteria demonstrated more accurate NPV with 98.4 percent and absence of patient who required percutaneous abdominal drainage after early drain removal.

Conclusion: Our criteria performed sufficient results. However, further accumulation of perioperative data could be contribute for establishing safer criteria of early drain removal.

Keywords: Criteria, Early drain removal, Pancreatic fistula.

OP07-8
Decreased Morbidity Following Pancreaticoduodenectomy by Using a Combined Protocol of Surgery, Anesthesia and Reanimation
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Background: The more aggressive technique of pancreaticoduodenectomy with extended lymphadenectomy for malignant tumors improves the late oncologic outcome. The objective of this study was to appreciate the outcomes of an extensive surgical technique of pancreaticoduodenectomy performed with modified anesthesia and reanimation protocol.

Material and Method: We have analyzed retrospectively 150 patients with Whipple and Traverso-Longmire procedures. The patients were divided in two groups in relation with the extension of organ resection and the level of lymphadenectomy: the group I of 59 patients with extended pancreaticoduodenectomy plus extended lymphadenectomy (D2) performed under general anesthesia completed with peridural analgesia, and with early postoperative enteral nutrition by a nasojugal catheter; this was compared to group II of 91 patients with standard lymphadenectomy only, with classical anesthesia and intensive care.

Results: The overall postoperative morbidity was 21% in group I, and 45% in group II. The overall hospital mortality was 4% in group I and 8% in group II. The survival rate was significantly higher in group I (84% during the first year, 51% during the second year) compared to 56% and 10% survival at 1 year and 2 years, respectively, in patients of group II. The impact of a more aggressive approach (including multiorgan resection) compared with classical technique was also evaluated.

Conclusions: The use of epidural analgesia instead of major anesthetic drugs and early enteral feeding by nasojugal catheter significantly ameliorate the postoperative followings and patient recovery. This protocole allows the increase of surgical aggressiveness, but with no increase of hospital morbidity and mortality. This may have positive impact on late survival.

Keywords: Pancreaticoduodenectomy, Early Postoperative Enteral Nutrition, Epidural Analgesia.

OP07-9
The Feasibility of Tissue Specimen Obtained from EUS-FNA for Patient-Derived Tumor Xenograft in Pancreatic Cancer
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Background and Aims: There has been an increasing interest in the development and characterization of patient-derived tumor xenograft (PDTX) models for cancer research. Although most of the published studies have relied on surgical specimens, it is difficult in pancreatic cancer because most patients were initially diagnosed as advanced stage and surgically inoperable. The aim of our study is to evaluate the feasibility of PDTX using EUS-FNA specimens in pancreatic cancer.

Patients and Methods: Patients who were referred for EUS-guided tissue acquisition were prospectively enrolled. Among them, patients with locally advanced or distant metastasis were included. After the acquisition of tissue specimen for pathologic diagnosis, additional EUS-guided tissue sampling was performed for xenograft and storage for further DNA analysis. The acquired FNA specimen was implanted subcutaneously into the dorsal region of athymic nude mouse. We evaluated the success rate of implantation and compared the histologic correlation between human tumor and xenograft mass.

Results: Between April 2014 and January 2015, 10 patients (median age, 69 years; range 47–79; male:female ratio, 7:3) were
Fig. 1. Cytological and immunohistochemical findings of case No. 5 in the cell block specimen of the human endoscopic ultrasound-guided fine-needle aspiration (a) and in the xenografted mass (b). The immunohistochemical staining showed a similar pattern to ductal adenocarcinoma both in the human cell block specimen and the xenografted material (for Abstract OP07-9).

Fig. 2. Cytological and immunohistochemical findings of case No. 6 in cell block specimen of the human endoscopic ultrasound-guided fine-needle aspiration specimen (a) and in the xenografted mass (b). The immunohistochemical staining showed a similar pattern to acinar cell carcinoma both the human cell block specimen and the xenografted material (for Abstract OP07-9).
enrolled and all were diagnosed as pancreatic cancer by EUS-tissue sampling. The mean size of tumor was 32.7 mm by 25.6 mm. Tumor formation was observed in two cases (20%) at 3 week and 5 week after implantation. Finally, it took 6 weeks and 21 weeks until the growth of 1 cm³ in volume. In successful xenograft tissues, histologic and immunohistochemical staining revealed identical pathologic findings to those of the human tumor (fig. 1, 2).

Conclusions: With the successful PDTX using EUS-FNA specimen in pancreatic cancer, we expect that this may contribute to the development of a tailored therapy for pancreatic cancer in the future. However, further studies are required to shorten the growth period to obtain a sufficient volume of xenograft before applying clinical application.

Keywords: Xenograft, Pancreatic cancer, EUS-FNA.

OP08-1
The Influence of the Appendiceal Base Diameter on Appendix Stump Closure in Laparoscopic Appendectomy
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Background: Closure of the appendiceal stump is the most critical part of laparoscopic appendectomy. Establishing the average diameter of the inflamed appendix, and forming the appropriate size of clip, endoloop or stapler length, would make this critical phase of laparoscopic appendectomy easier.

Methods: One hundred and fifty consecutive patients, with the diagnosis of acute appendicitis, were included in the study and divided into three groups according to the histological verification of the status of the infection, as follows: phlegmonous, gangrenous and perforated forms of acute appendicitis. The external diameter of the appendiceal base was measured, and the widest part of the appendix with the mesoappendix and the tip, with the help of Vernier callipers, and the measurement was expressed in millimetres.

Results: The average size of the appendiceal base in the phlegmonous form was 10.29 ± 3.13, in the gangrenous form 12.41 ± 3.56, and in the perforated form 12.42 ± 3.64. The maximal size of base was observed in the perforated form, 23.13 mm. The dimensions of the appendiceal base, the central part and the tip in the phlegmonous form were statistically significantly smaller than in the gangrenous and perforated forms of acute appendicitis. The size of the appendix did not differ statistically significantly in the gangrenous and perforated forms of acute appendicitis.

Conclusion: In view of the price, the size of the opening, radiological advantage and bio-compatibility, the Hem-o-lak clip is the most effective, although its internal diameter should be increased. The DS clip is also effective, but the size of the opening sometimes makes application difficult, and possibly increasing the length of the legs and the opening would make this clip ideal. Staplers have the best characteristics, but their price means they are an option only for forms where it is not possible to close the stump using other methods.

Keywords: Laparoscopic appendectomy, Appendiceal stump, Endoloop, Stapler, Haem-o-lak clip, DS clip.

OP08-2
Anorectal Malformations: A 5 Year Review of the Presentation and Management in a Teaching Hospital in Ghana
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Background: Anorectal malformations (ARM) are congenital defects affecting the distal gastrointestinal tract and anus with frequent fistulous connections to the genitourinary system. The spectrum of the disease is considerably wide and thus an individualized approach to its management is required. There are few recent publications about the burden of this malformation in Africa and the outcome of surgical intervention. We present our experiences with the management of ARM, our peculiar challenges and the outcome at a tertiary hospital catering for the Northern and Central parts of Ghana.

Methods: This was a retrospective folder review of children with ARM at the Paediatric Surgical Unit of Komfo Anokye Teaching Hospital, Kumasi, Ghana from 2011 to 2015. The data extracted included diagnosis, associated features, initial and definitive surgical treatment and the post operative complications.

Results: Of the 53 records that were conclusively retrieved, the sex ratio was 1:1. The median age of presentation was 4.5 days (neonates), 4.5 months (infants), 1.6 years (older children). There were 12 (44%) Rectoperineal and 18 (69%) Rectovestibular fistulas representing the most common types of ARM in boys and girls respectively. PSARP and abdominoperineal pull-through were the corrective procedures performed. The overall complication rate was less than 10%.

Conclusion: Our patients generally presented later than their western counterparts making a single stage correction rare. Rectoperineal fistula in males occurred in frequencies higher than that reported elsewhere.

Keywords: Anorectal malformations, Posterior sagittal anorectoplasty.
**OP08-3**

**Isolation of Internal and External Sphincter Progenitor Cells for Fecal Incontinence: The First Study Using the Human Anal Sphincter**

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**Introduction:** This study aimed to identify internal and external sphincter progenitor cells as potential tools for tailored cell therapy in fecal incontinence.

**Methods:** Sphincter progenitor cells were isolated via the pre-plate technique from normo internal and external anal sphincters of 10 rectal cancer patients who underwent abdominoperineal resection. Isolated cells and differentiated muscle fibers were identified with immunofluorescence, western blotting and RT-PCR. Proliferation of progenitor cells according to the radiotherapy were compared using quantitative analyses of clonogenic and MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assays.

**Results:** Immunofluorescence before differentiation confirmed that the internal anal sphincter progenitor cells were positive for CD34 and neural-glial antigen 2 (NG2), while external anal sphincter progenitor cells expressed CD34, Pax7, and NG2. After differentiation, internal anal sphincter progenitor cells were positive for α-SMA, calponin, and desmin, while external anal sphincter progenitor cells were positive for MyHC, MyoG, and desmin. Different expression profiles were observed in western blotting and RT-PCR, which was identical to that observed by immunofluorescence. In MTT assays of internal anal sphincter progenitor cells, the radiotherapy group was lower than the non-radiotherapy group at 24 h (14.1% vs. 11.5%, p = 0.033), 48 h (14.7% vs. 11.9%, p = 0.022), 72 h (15.3% vs. 12.5%, p = 0.012), 96 h (16.2% vs. 13.1%, p = 0.012), and 120 h (14.8% vs. 13.6%, p = 0.536), as were confirmed similar in external anal sphincter progenitor cells and clonogenic assays.

**Conclusions:** This is the first study showing the differential harvest of internal and external anal sphincter muscle progenitor cells using the human anal sphincter. We suggest that internal or external anal sphincter progenitor cells may be used for tailored cell therapy for fecal incontinence.

**Keywords:** Fecal incontinence, Anal sphincter progenitor cell, Tailored cell therapy.

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**OP08-4**

**Functional Outcomes after Ileal Pouch Anal Anastomosis in Patients with UC**

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**Background/Aims:** Restorative proctocolectomy using ileal pouch anal anastomosis (IPAA) is a standard surgery to treat patients with ulcerative colitis (UC). Despite the development of drug therapy, surgical treatment has been necessary in a relevant proportion of patients with UC throughout lifetime. The aim of this study is to evaluate the functional changes of anal sphincter and defecation using anal manometry before and after IPAA in UC patients.

**Method:** Clinical data of 192 UC patients who underwent abdominal surgery from 1991 to 2013 were reviewed. Parameters of anal manometry and daily stool frequency were compared according to periodic groups of preoperative period, postoperative 6 months, postoperative 6–12 months, and postoperative 12–24 months.

**Results:** The preoperative maximum squeezing pressure (MSP) was 157.6 mm Hg and maximum resting pressure (MRP) was 62.6 mm Hg. MSP and MRP were decreased at 6 month (MSP 134.9 and MRP 57.6), and recovered at 12 months (MSP 166.9 and MRP 54.7). Preoperative maximum tolerable volume (MTV) was 91.9 cc, which decreased to 82.2 cc at 6 months. However, MTV subsequently improved up to 130.0 cc at 6 months and 136.7 cc at 12–24 months. Stool frequency steadily decreased to 8.19 times at 6 months, 6.48 times at 6–12 months, and 5.87 times at 12–24 months.

**Conclusion:** The functional injury inflicted upon the sphincter during the operation made a gradual recovery and maximal resting pressure improved after postoperative 12 month period. The restorative parameter of MTV showed increases after postoperative 6 month period.

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**OP08-5**

**Aspirin Utilization, Compliance and Prevention of Colorectal Cancer – A Single Centre Perspective**

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**Background:** Randomised controlled trials indicate daily low dose aspirin may reduce the risk of colorectal by up to 20%. Aspirin is currently prescribed or self administered regularly to prevent heart disease. For colorectal cancer chemoprevention, a broader understanding of community use, is required. We performed a prospective observational study on aspirin use in our community.

**Method:** Prospective data was collected using questionnaires over a six month period from patients attending surgical clinic.

**Results:**

**Aspirin group:** 137 patients; male: 72, female: 65. Mean age 65.8 years (range: 23–100). 76.6% took 81 mg, 32.9% did not know what
dose they were taking, 5.8% were taking >300 mg. 62% were taking aspirin on physician advice. Only 25.6% of patients stated they never missed a dose of aspirin, 39% admitted to missing doses weekly to monthly, 3% never took it. 5.8% reported side effects. 9.5% were aware of aspirin’s anticancer effects.

**Non-aspirin**: 383; male: 135, female: 248. Mean age 53.3 (18–90). 1% had ceased aspirin in the past. 4.7% knew of anticancer effects. Mean age aspirin vs. non-aspirin differed significantly (unpaired t-test, p < 0.001). Patients on aspirin were more likely to be male (Fisher’s exact test, p = 0.0005), aged over 40 (p < 0.0001), without heart disease (IHD)/diabetes (p < 0.002), or taking less than 5 concurrent medications (p < 0.0001). There was no significant difference between the groups in anticoagulation use, additional NSAID use or smoking (p = 0.51, p = 0.20, p = 0.19). Knowledge of anticancer effect showed a lack of significance (p = 0.06) favoring the aspirin group.

**Conclusions**: Aspirin use in our community tends to be gender-specific, in older groups with less comorbidities. Overall awareness of anticancer effect is suboptimal. Over 40% of patients were non-compliant. This has implications for wider community use of aspirin in colorectal cancer chemoprevention.

**Keywords**: Aspirin, Colorectal cancer, Chemoprevention, Randomised controlled trials, Compliance.

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**OP08-6**

**Development of An Enhanced Recovery after Surgery (ERAS) Protocol in Colorectal Surgery: Preliminary Results from a Single Center Experience**

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**Background/Aims**: Enhanced recovery after surgery (ERAS) represents a dynamic culmination of upon perioperative care elements leading to a reduction of post-operative morbidity and hospital stay. Aim of the study was to develop and apply an ERAS protocol in patients treated for colorectal disease.

**Methods**: Between September 2014 and April 2015 all patients suffering from benign or malignant colorectal diseases were preoperatively evaluated and included in the study. No bowel preparation was performed and laparoscopic approach was used in all patients if not contraindicated. Patients were discharged when adequate mobilization, canalization and pain control were obtained. Analyzed outcomes were: length of post-operative hospital stay, readmission rate, compliance to protocol and peri-operative morbidity and mortality.

**Results**: Ninety patients, with a mean age of 62.7 ± 13.2 y.o., were treated following ERAS protocol and analyzed. Malignant lesions were the most common indication (71/90; 79%) while benign diseases were treated in 19 patients (21%). Laparoscopic approach was performed in the 94.4% of cases (85/90) with a conversion rate of 5.8% (5/85). Surgical procedures performed were: 26 rectal resections (28.9%), 16 left-hemicolectomy (17.8%), 13 sigmoidectomy (14.4%), 29 right-hemicolectomy (32.2%) and 6 Miles procedures (6.7%). With a compliance to the protocol of 95.6% (86/90) we recorded a mean hospital stay of 4.2 ± 0.9 days in the whole series. The shortest hospitalization was observed after right hemicolectomy (3.8 ± 1 days) while the longest after Miles procedure (4.8 ± 0.7 days). With a morbidity rate of 3.3% (3/90) no anastomotic leak and non re-admission at 30 days were recorded. Moreover over no peri-operative mortality was observed.

**Conclusions**: In our experience the introduction of an ERAS protocol for colorectal surgery allows a shorter post-operative hospital stay and a faster patients recovery. Moreover a reduction of peri-operative morbidity with no incidence of anastomotic leak was observed in the series.

**Keywords**: Enhanced recovery after surgery, Colorectal cancer, Laparoscopic.
A Study on Bowel Preparation Quality in Patients with a History of Colorectal Resection

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Background/Aim: Bowel preparation for surveillance endoscopy following surgery can be impaired by suboptimal bowel function. We hypothesized that the bowel preparation quality of patients with colorectal surgery might be not inferior. Our study compares two groups of patients in order to evaluate the influence of colorectal resection on bowel preparation.

Method: From January 2013 to June 2015, 200 patients were enrolled in our retrospective study and divided into two groups: resection group (RG) and control group. Surgical methods were classified as right hemicolectomy, left hemicolectomy including rectosigmoidectomy. Bowel cleansing was evaluated by one skilled endoscopist using the Aronchick scale and modified Boston scale. The patients received either a low-volume preparation (2L Polyethylene glycol with Ascorbic acid) versus a standard high-volume preparation (4 L Polyethylene glycol) for bowel cleansing.

Result: Among the patients of the RG, surgery was as follows: left hemicolectomies (10%), right hemicolectomies (34%), rectosigmoidectomy (56%). No significant difference was observed between the resected population and control in achievement of adequate cleansing. (6–9 Modified Boston scale score: 88% vs. 88%, 1–2 Aronchick scale: 76% vs. 74%). According to the logistic regression analysis of the RG group, the predictors of unsuccessful cleansing were previous left hemicolectomy (OR 0.27, p = 0.028). However, a longer elapsed time since the intervention and a low-volume preparation were not associated with unsuccessful preparation.

Conclusion: Our study highlights that previous colonic resection is not a risk factor for a worse bowel preparation.

Keywords: Bowel preparation, Colorectal surgery.

Our Experience in Living Donor Liver Transplantation

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The Aim of Study: To improve the results of liver transplantation in the Republic of Kazakhstan.

Materials: The first liver transplantation (LT) in the Republic of Kazakhstan performed in December 2011, in Syzganov’s National Scientific Center of Surgery. For December 2015, we have provided 33 liver transplant operations, both from cadaveric and liver donors.

Living donor LT performed in 24 (72.7%) cases, cadaveric donor LT – in 9 cases (27.3%) cases. Recipients was in age between 16 and 60 years old. Before liver transplantation days recipient’s prognostics scores ranged as Child-Turcotte-Pugh B and C classes, MELD – from 12 to 27. Seven patients found with portal vein thrombus.

Results: Nine recipients (27.2%) had different surgical and non-surgical complication, as acute intraabdominal bleeding (6), hepatic artery thrombosis (2), acute rejection crisis (1), cholangiogenic abscesses (1), pneumonia (2), ischeimcal cerebral injuries (2). Six recipients (18.2%) died in early post-operative period, in reasons of post-hemorrhagic, infectious problems or cerebral injuries.

In living donors, there were three (12.5%) post-surgical complications presented as bile leakage (2) and acute intraabdominal bleeding (1). All living donors are rehabilitated after surgery and following normal lifestyle.

Conclusion: The development of living donor liver transplantation programme in the Republic of Kazakhstan looks a good option; however, cadaveric donor transplantation programme is preferable for developing, because of high risk of complications in donor’ surgery.

Keywords: Liver transplantation.
EHD tumors (RR 11.2, \( P = 0.0058 \)), and non-incidentally EHD diagnostis (RR 8.41, \( P = 0.018 \)) in the ITT cohort, and primary T stage 1–2 (RR 22.2, \( P = 0.013 \)), primary N stage (RR 4.42, \( P = 0.031 \)), metachronous metastases (RR 6.48, \( P = 0.013 \)), and CA19-9 <37 U/ml (RR 27.4, \( P = 0.012 \)) in the EHD resection cohort as independent predictive factors of cure.

**Conclusions:** An aggressive oncological approach could achieve cure in 13% of patients with CRLM and concomitant EHD on an ITT basis. When complete resection of both hepatic and extrahepatic diseases is performed, cure rate could raise 19% of the patients. Therefore, even in the presence of EHD, an aggressive oncosurgical approach should be intended in patients with CRLM with a hope of cure.

**Keywords:** Colorectal liver metastases, Extrahepatic disease, Cure, Hepatectomy.

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**OP09-4**

**Liver-First Approach for Synchronous Colorectal Liver Metastasis: A Single Center Experience with Long-Term Follow-Up**

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**Aims:** This study was designed to investigate the outcome of ‘liver-first’ approach in patients with locally advanced colorectal cancer and synchronous liver metastases.

**Methods:** Between June 2007 and June 2014, 60 patients (34 male, 26 female) were selected to undergo the liver-first approach. All these patients had a minimum 2 years follow up; the primitive tumour was in the rectum in 39 cases and in the rest of the colon in the other 21 cases. None of these patients were symptomatic. Different types of neo-adjuvant regimens were used.

**Results:** The median follow-up was of 38 months (24–92) and a median Clinical Risk Score of 3. The protocol was completed in 57 (95%) patients (3 excluded due to tumour progression). 33 patients (55%) were considered not optimally resectable at the time of diagnosis. 21 pt (35%) underwent a laparoscopic liver resection. The mean post-operative hospital stay after liver surgery was of 6, 7 days. The overall morbidity was of 17.4% and 21.7% in liver and colo-rectal surgery respectively, with a 40% of Clavien 3 complications after colorectal surgery. No major complications were observed after liver surgery. We did not observe 3-months post-operative mortality after liver and colorectal surgery. Liver recurrence was recorded in 31 patients (51.6%). The 1–3–5 years Disease free survival (considering the liver procedure) and the Overall survival were respectively 51%–16.6%–16.6% and 95.7%–80.8%–54%.

**Conclusions:** The liver-first approach is a safe procedure. There is a potential overall survival benefit that must be further proven.

**Keywords:** Colorectal liver metastasis, Liver first, Liver surgery, Synchronous metastasis.

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**OP09-5**

**Twelve-Year Experience of ‘Radical But Conservative’ Liver Surgery for Colorectal Metastases. Standardization of the Approach and Review of Its Oncologic Efficacy**

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**Background:** Liver surgery is moving toward a parenchymasparing approach. The authors extended this approach to deep-located colorectal liver metastases, but concerns persist about safety and oncologic adequacy. To elucidate the impact of ultrasound-
guided aggressive parenchyma-sparing policy on treatment of colorectal liver metastases, to standardize it (clear indications for separate procedures), and to clarify its oncologic efficacy.

**Methods:** Among the 323 consecutive patients undergoing first liver resection for colorectal liver metastases between 2004 and 2013, the 169 carrier of metastases with major vascular contact were considered. Patients undergoing major hepatectomy or two-stage hepatectomy were excluded. The 146 (86%) undergoing parenchyma-sparing liver resection were analyzed. The authors’ technique relied on: 1) tumor-vessel detachment if no infiltration at imaging; 2) partial resection of hepatic veins marginally infiltrated; 3) detection of communicating vessels among hepatic veins to preserve outflow after main hepatic vein resection.

**Results:** Among the 146 included patients, colorectal liver metastases were >3 in 82, and bilobar in 87. The authors performed 28 SERPS, 13 transversal hepatectomies, 6 mini-mesohepatectomies, 4 liver tunnels. Sixty-six (45%) patients had tumor-vessel detachment, 25 (17%) hepatic vein partial resection and reconstruction, and 30 (21%) outflow preservation thanks to communicating vessels. Mortality, overall and severe morbidity rates were 1.4%, 29%, and 8%, respectively (liver dysfunction 6%). Five-year survival was 30.7% (median follow-up 39.9 months). Fourteen (7%) patients had parenchyma-sparing strategy failure (recurrence in the spared parenchyma/cut-edge recurrence); 13 were radially retreated.

**Conclusions:** Ultrasound-guided parenchyma-sparing policy is safe and effective even for ill-located colorectal liver metastases. Provided its technical principles, this policy can be easily standardized.

**Keywords:** Liver surgery, Colorectal liver metastases, Intraoperative ultrasonography, Parenchyma-sparing surgery.

**OP09-6**

**PET-CT in Patients with Recurrent Colorectal Liver Metastases: Impact on Restaging and Treatment Planning**

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**Background:** The impact of fluoro-deoxy-glucose positron emission tomography-computed tomography (PET-CT) in patients with colorectal liver metastases is still debated. Its relevance could be enhanced in case of recurrent disease. The present study aims to elucidate the role of PET-CT in restaging and treatment planning of recurrent colorectal liver metastases.

**Methods:** A series of 352 consecutive patients undergoing first liver resection for colorectal liver metastases between 2005 and 2014 was revised. Of these, 224 (63.6%) had recurrence. The 107 patients having PET-CT at diagnosis of recurrence before chemotherapy were analysed. CT was available in all cases, magnetic resonance imaging (MRI) in 64.

**Results:** Among the 107 patients, 59 (55.1%) had extra-hepatic lesions. Liver and lung recurrences were detected with excellent sensitivity by CT/MRI and PET-CT (liver: 100% vs. 96.7%; lung: 95.8% vs. 95.8%). PET-CT had higher sensitivity than CT/MRI in detecting other recurrence sites (91.5% vs. 54.2%, p < 0.01); lymphnodes 93.5% vs. 64.5%, p = 0.011; peritoneum 80% vs. 20%, p = 0.023; bones 87.5% vs. 37.5%, p = n.s.. In 28.8% of patients (17/59) the diagnosis of extra-hepatic disease was obtained thanks to PET-CT (39.5% considering non-pulmonary lesions).

PET-CT modified treatment strategy in 16 (14.9%) patients, excluding from surgery 15 of 74 (20.3%) patients resectable at CT/MRI. This latter subgroup had lower survival than patients resectable after PET-CT (two-year survival 22.7% vs. 77.8%, p = 0.004), similar to patients unresectable at CT/MRI (57.6%).

**Conclusions:** In our experience, PET-CT offered a relevant contribution to restaging recurrent colorectal liver metastases. It disclosed one third of extra-hepatic lesions and prevented worthless surgery in about 20% of patients.

**Keywords:** PET, CT, Colorectal liver metastasis, Liver surgery, Recurrences, Survival.

**OP09-7**

**Preoperative Identification of Communicating Vessels among Hepatic Veins in Patients Undergoing Liver Surgery for Tumors at the Caval Confluence**

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**Background:** Preserving adequate outflow is crucial for favorable outcomes after hepatectomy. Communicating vessels (CV) among hepatic veins (HV) are identified by intraoperative ultrasound (IOUS) in the majority of patients with tumors involving HVs. CVs open further prospective at new parenchyma-sparing resection. The possibility to preoperatively identify CVs remains unclear. The capability of radiological imaging to detect CVs, predictors of their presence and safety of parenchyma-sparing CV-based surgery were investigated.

**Methods:** Fifty-two consecutive patients with at least one CV detect at IOUS were analyzed. Preoperative imaging was retrospectively reviewed. CVs were classified as complete and incomplete. Based on anatomical features, CVs were classified as HV-accessory HV and HV-HV.

**Results:** CVs were evident at preoperative imaging in 29 (56%) patients. Fifty-seven patients were classified as complete and complete. The absence of chronic hepatitis (p = 0.033). Larger the angle between the axis of adjacent HVs lower the probability to detect CVs (p = 0.048), being 53° the best cut-off (sensitivity = 64%; specificity = 90%; AUC = 0.727; p = 0.05).

32 patents underwent major hepatectomy (three left hepatectomies and 25 (17%) hepatic vein partial resection and reconstruction, and 30 (21%) outflow preservation thanks to communicating vessels. Mortality, overall and severe morbidity rates were 1.4%, 29%, and 8%, respectively (liver dysfunction 6%). Five-year survival was 30.7% (median follow-up 39.9 months). Fourteen (7%) patients had parenchyma-sparing strategy failure (recurrence in the spared parenchyma/cut-edge recurrence); 13 were radially retreated.

**Conclusions:** Ultrasound-guided parenchyma-sparing policy is safe and effective even for ill-located colorectal liver metastases. Provided its technical principles, this policy can be easily standardized.

**Keywords:** Liver surgery, Colorectal liver metastases, Intraoperative ultrasonography, Parenchyma-sparing surgery.

**OP09-6**

**PET-CT in Patients with Recurrent Colorectal Liver Metastases: Impact on Restaging and Treatment Planning**

Marta Silvestri¹, Luca Viganò², Egesta Lopci², Marcello Rodari², Dario Poretti³, Vittorio Pedicini³, Luigi Solbiati³, Arturo Chiti³, Guido Torzilli³

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**Methods:** A series of 352 consecutive patients undergoing first liver resection for colorectal liver metastases between 2005 and 2014 was revised. Of these, 224 (63.6%) had recurrence. The 107 patients having PET-CT at diagnosis of recurrence before chemotherapy were analysed. CT was available in all cases, magnetic resonance imaging (MRI) in 64.

**Results:** Among the 107 patients, 59 (55.1%) had extra-hepatic lesions. Liver and lung recurrences were detected with excellent sensitivity by CT/MRI and PET-CT (liver: 100% vs. 96.7%; lung: 95.8% vs. 95.8%). PET-CT had higher sensitivity than CT/MRI in detecting other recurrence sites (91.5% vs. 54.2%, p < 0.01); lymphnodes 93.5% vs. 64.5%, p = 0.011; peritoneum 80% vs. 20%, p = 0.023; bones 87.5% vs. 37.5%, p = n.s.. In 28.8% of patients (17/59) the diagnosis of extra-hepatic disease was obtained thanks to PET-CT (39.5% considering non-pulmonary lesions).

PET-CT modified treatment strategy in 16 (14.9%) patients, excluding from surgery 15 of 74 (20.3%) patients resectable at CT/MRI. This latter subgroup had lower survival than patients resectable after PET-CT (two-year survival 22.7% vs. 77.8%, p = 0.004), similar to patients unresectable at CT/MRI (57.6%).

**Conclusions:** In our experience, PET-CT offered a relevant contribution to restaging recurrent colorectal liver metastases. It disclosed one third of extra-hepatic lesions and prevented worthless surgery in about 20% of patients.

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Our ideas might be very useful for safe and reliable Lap-H, even in the hands of less experienced surgeons.

Background: Acute pancreatitis remains a common disorder with devastating consequences. Although most episodes are mild and self-limiting, about one fifth patient develops a severe attack that can be fatal. Inspite of technical advances in medical and surgical treatment, severe acute pancreatitis continues to carry a high mortality rate and the mortality rate is more in cases of delayed diagnosis, treatment and management. Procalcitonin (PCT) is a well-recognized biomarker for predicting severity and mortality of acute pancreatitis. It is a 113-amino-acid polypeptide, which is a precursor of calcitonin; a hormone synthesized and secreted by parafollicular C-cells of the thyroid gland. Its serum level is increased in infection, inflammation and tissue damage. PCT is a sensitive marker for the presence of systemic infection and a predictive marker for sepsis. Although PCT is shown to be an effective marker for predicting severity of acute pancreatitis, it is not widely accepted due to lack of standardization, high costs and time delays in obtaining results.

Materials and methods: A total of 100 patients who had been diagnosed with acute pancreatitis at our hospital from August 2011 to August 2015 were included in this study. They were divided into two groups based on the presence of organ failure and according to the APACHE-II criteria. Group-A had 37 patients and they had milder disease while Group-B, which had 63 patients, had more severe disease, including organ failure. PCT was measured at the time of admission, 24 hours later and on the 7th day of admission. The APACHE-II score was calculated on admission and on the 7th and 28th day of admission. The statistical analysis was done using SPSS 16.0.

Results: The mean serum PCT on admission in Group-A was 1.49 (± 2.49) ng/ml and in Group-B they were 12.8 (± 6.2) ng/ml. The mean serum PCT on the 24th hour in Group-A was 1.27 (± 2.13) ng/ml and in Group-B it was 12.3 (± 10.7) ng/ml. The mean serum PCT on the 7th day in Group-A was 0.21 (± 0.32) ng/ml and in Group-B it was 4.53 (± 3.3) ng/ml. There were significant differences between the two groups in all PCT values (P < 0.05). The mean APACHE-II score on admission, 7th and 28th days of admission in Group-A was 2.8 (± 6.2), 2.2 (± 6.1) and 1.7 (± 5.6) respectively and in Group-B it was 7.8 (± 6.0), 20.7 (± 6.8) and 16.3 (± 6.7) respectively. There were significant differences between the two groups in all APACHE-II scores (P < 0.05).

Conclusion: The present study suggests that PCT can be a useful marker for predicting the severity and the outcome of acute pancreatitis. Higher serum PCT levels predicts organ failure and mortality. PCT values can be a useful marker for early diagnosis and management of acute pancreatitis.

Keywords: Procalcitonin, Acute Pancreatitis, Severity.
surgical fields, pancreatitis remains a major cause of morbidity and mortality. The aim of this study is to assess serum Procalcitonin (PCT) for early prediction of severe acute pancreatitis compared with multiple scoring systems and biomarkers.

**Methods:** Fifty patients with acute pancreatitis confirmed by radiological evidences, laboratory assessments, and clinical manifestations were prospectively enrolled in this study. All blood samples and image studies were obtained within 24–72 hours of admission and the severity was predicted.

**Results:** Acute pancreatitis was graded as severe in 21 patients and mild in 29 patients as per the Atlanta criteria. Levels of serum PCT were significantly higher in severe acute pancreatitis (p ≤ 0.001). The sensitivity, specificity, PPV, NPV and accuracy of PCT in predicting severity of acute pancreatitis were 80.95%, 87.09%, 89.47%, 97.09 and 88% respectively. Accuracy of PCT was less when compared to Ranson score (92%) and better than the Balthazar CT index (86%), CRP (78%) and Glasgow (76%). The most effective cut-off level of serum PCT was estimated at 1.01–1.8 ng/ml with PPV of 89.47%. Mortality due to severe acute pancreatitis was 9.52% (2 of 50).

**Conclusions:** Serum PCT was a promising simple biomarker with better accuracy which is comparable to Glasgow and BCTSI scores in predicting severity of acute pancreatitis.

**Keywords:** Acute pancreatitis, Serum procalcitonin, Pancreatic necrosis and multiple scoring systems in acute pancreatitis.

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**OP10-2**

**Adjuvant Role of Preoperative Liver Magnetic Resonance Imaging for Potentially Resectable Pancreatic Cancer**

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**Background and Aim:** The adjuvant role of liver magnetic resonance imaging (MRI) before the resection of pancreatic ductal adenocarcinoma (PDAC) is unclear. We evaluated whether liver MRI combined with multi-detector computed tomography using a pancreatic protocol (pCT) can help surgeons select appropriate surgical candidates and reduce the risk of early recurrence.

**Methods:** One hundred sixty-seven patients in whom complete resection was achieved with no grossly visible residual tumor were enrolled retrospectively. One hundred two patients underwent pCT alone (CT group), and 65 underwent liver MRI and pCT (MRI group).

**Results:** By adding liver MRI, hepatic metastases were newly discovered in 3 of 58 patients (5.2%) without hepatic lesions on pCT and 17 of 53 (32.1%) with indeterminate hepatic lesions on pCT. Patients with borderline resectability, a tumor size >3 cm, or preoperative carbohydrate antigen 19-9 level >1,000 U/ml had a higher rate of hepatic metastasis on subsequent liver MRI. Among 167 patients in whom R0/R1 resection was achieved, the median overall survival was 18.2 vs. 24.7 months (p = 0.020) and the disease-free survival was 8.5 vs. 10.0 months (p = 0.016) in the CT and MRI groups, respectively (median follow-up, 18.3 months). Recurrence was seen in 82 (80.4%) and 43 (66.2%) patients in the CT and MRI groups, respectively. The cumulative hepatic recurrence rate was higher in the CT group than in the MRI group (p < 0.001), although recurrences at other sites were similar in both groups.

**Conclusion:** Preoperative liver MRI should be considered in patients with potentially resectable PDAC, especially in those with a higher tumor burden.

**Keywords:** Hepatic metastasis, Liver magnetic resonance imaging, Pancreatic ductal adenocarcinoma.

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**OP10-3**

**KRAS Mutation in Circulating DNA of Pancreatic Cancer Patients**

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**Background:** Circulating DNA or cell free DNA (cfDNA) has been known to be released from tumor cells and investigated potential biomarkers in many cancers. However, the impact of cfDNA in pancreatic cancer has not been well evaluated. Here we studied cfDNA KRAS mutation as a prognostic marker in patients with pancreatic cancer.

**Method:** Total of 66 pancreatic cancer patients was included in the study. cfDNA extracted from plasma by QIAamp Circulating Nucleic Acid Kit (Qiagen, Germany) and quantified using the Quant-It dsDNA HS Assay Kit (Thermo Fisher Scientific, USA). Droplet Digital PCR System (QX200, Biorad, USA) was applied to measure frequency of KRAS mutation. Mutant concentration and fractional abundance were analyzed by QuantaSoft software (Biorad, USA). Statistical analysis for progression free survival (PFS) and overall survival (OS) was done by Cox proportional hazard model.

**Result:** KRAS mutation fraction (%) according to stage of pancreatic cancer (resectable, locally advanced and metastatic) showed significant difference (p < 0.001). Furthermore, hazard ratios (HRs) for PFS and OS of KRAS mutation fraction was significant as 1.06 (p < 0.0001) and 1.05 (p = 0.0004), respectively. However, cfDNA concentration did not showed implication for PFS and OS.

**Conclusion:** This result represents that KRAS mutation of cfDNA in pancreatic cancer could be prognostic marker. In further studies, we will explore KRAS mutation status of primary tumor and serial plasma cfDNA.

**Keywords:** Pancreatic cancer, Circulating DNA, KRAS.
Outcomes of Pancreaticoduodenectomy in Elderly Patients: Single Egyptian Center Experience

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Background: Although the mortality and morbidity of pancreaticoduodenectomy (PD) have improved significantly over the past years, the concerns for elderly patients undergoing PD are still present. Furthermore, the frequency of PD is increasing because of the increasing proportion of elderly patients and the increasing incidence of periampullary tumors. This study aimed to analyze the outcomes of PD in elderly patients.

Methods: We studied all patients who had undergone PD in our center between January 1995 and February 2015. The patients were divided into three groups based on age: group I (patients aged <60 years), group II (those aged 60 to 69 years) and group III (those aged ≥70 years). The primary outcome was the rate of total postoperative complications. Secondary endpoint included total operative time, hospital mortality, length of postoperative hospital stay, delayed gastric emptying, re-exploration, and survival rate.

Results: A total of 828 patients who had undergone PD for resection of periampullary tumor were included in this study. There were 579 (69.9%) patients in group I, 201 (24.3%) in group II, and 48 (5.8%) in group III. The overall incidence of complications was higher in elderly patients (25.9% in group I, 36.8% in group II, and 37.5% in group III; P = 0.006). There were more patients complicated with delayed gastric emptying in group II compared with the other two groups. There was no significant difference in the incidence of postoperative pancreatic fistula, biliary leakage, pancreatitis, pulmonary complications and hospital mortality.

Conclusions: PD can be performed safely in selected elderly patients. Advanced age alone should not be a contraindication for PD. The outcome of elderly patients who have undergone PD is similar to that of younger patients, and the increased rate of complications is due to the presence of associated comorbidities.

Keywords: Pancreaticoduodenectomy, Elderly, Pancreatic Fistula, Delayed gastric emptying.

OP10-5
Attenuated Role of Neoadjuvant Concurrent Chemoradiotherapy in Resectable Uncinate Process Pancreatic Cancer

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Background: Uncinate process pancreatic cancer (UPC) is usually discovered in a relatively advanced stage. However, neoadjuvant concurrent chemoradiotherapy (CCRT) followed by pan-
creatoduodenectomy (PD) in UPC have shown comparable oncologic outcome with that of usual pancreatic head cancer (PHC). This study aimed to evaluate oncologic outcome of resectable UPC and determine whether neoadjuvant CCRT is truly necessary.

Methods: A retrospective analysis of 204 patients with resected pancreatic head cancer at a single center from Jan. 2005 to Dec. 2014 was conducted. Clinicopathologic characteristics and oncologic outcomes of resectable UPC and resectable PHC were analyzed.

Results: Among 41 patients diagnosed with resectable UPC, 14 (34.1%) patients received neoadjuvant CCRT, whereas 27 (65.9%) patients received operation first. Overall survival between surgery first and neoadjuvant CCRT did not have significant difference (p = 0.341, mean survival 32 months vs. 18 months, respectively). During the same period, there were 90 patients diagnosed with resectable PHC. Survival outcomes between resectable UPC and resectable PHC were similar, with median survival of 26 and 20 months, respectively (p = 0.427).

Conclusion: UPC was recommended for neoadjuvant CCRT from a previous study. However, our analysis suggests that neoadjuvant CCRT may not have a significant role in resectable UPC and surgery should be recommended as a first option.

Keywords: Uncinate process, Pancreatic cancer, Pancreatectomy, Preoperative chemoradiation.

OP10-6
GLRX3 Is a Novel Molecular Diagnostic Marker for Pancreatic Cancer

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Background/Aims: Pancreatic cancer remains one of the most lethal cancers. Most pancreatic cancer is diagnosed at advanced stages and have poor prognosis. Carbohydrate antigen (CA) 19-9 is the tumor marker used in pancreatic cancer. However, CA 19-9 requires the presence of the Lewis blood group antigen to be expressed. Among individuals with a Lewis-negative phenotype (5–10% of the population), CA 19-9 levels are not a useful tumor marker. We selected the cancer stem cell specific biomarker, Glutaredoxin3 (GLRX3).

Methods: We investigated levels of GLRX3 in 165 pancreatic cancer patients, 13 chronic pancreatitis patients, and 40 patients without disease who were enrolled in pancreatic cancer cohort study in Severance hospital. The receiver operating characteristic (ROC) curve and area under the ROC curve (AUROC) were calculated to identify the optimal cut off GLRX3.

Results: The median levels of GLRX3 was higher in pancreatic cancer patients, 13 chronic pancreatitis patients, and 40 patients without disease who were enrolled in pancreatic cancer cohort study in Severance hospital. The receiver operating characteristic (ROC) curve and area under the ROC curve (AUROC) were calculated to identify the optimal cut off GLRX3.

Conclusion: Among 41 patients diagnosed with resectable UPC, 14 (34.1%) patients received neoadjuvant CCRT, whereas 27 (65.9%) patients received operation first. Overall survival between surgery first and neoadjuvant CCRT did not have significant difference (p = 0.341, mean survival 32 months vs. 18 months, respectively). During the same period, there were 90 patients diagnosed with resectable PHC. Survival outcomes between resectable UPC and resectable PHC were similar, with median survival of 26 and 20 months, respectively (p = 0.427).

Keywords: Uncinate process, Pancreatic cancer, Pancreatectomy, Preoperative chemoradiation.
A combination with CA 19-9 showed markedly improved AUROC over that of CA 19-9 alone in the diagnosis of pancreatic cancer against patients without disease.

Conclusions: We found that pancreatic cancer stem cells related biomarker GLRX3 plays a valuable diagnostic role in pancreatic cancer. These results suggest that GLRX3 could be a novel biomarker for pancreatic cancer in the future.

**OP10-7**
Chromogranin A (CgA) Serum Level as a Survival Marker of Pancreatic Cancer

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Background/Aims: The neuroendocrine differentiation in pancreatic cancer could represent a clinical significance with diagnostic, prognostic and therapeutic implications. This study aimed to investigate the clinical role of chromogranin A (CgA) as a neuroendocrine marker in pancreatic cancer.

Method: 357 patients, histologically confirmed by pancreatic ductal adenocarcinoma, were prospectively enrolled into this study between February 2010 and October 2013. CgA level was checked in all patients within 1 month from diagnosis. Study population was divided into two groups on the basis of upper limit of CgA normal range (94 ng/ml), high CgA and normal CgA group.

Result: This study of 357 patients included 219 males (61.3%) with a mean age of 62.6 years, and the median overall survival was 9.5 months. Patients of high CgA group (n = 150, 42%) had significantly older age, higher carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA19-9) level, lower BMI and hemoglobin level than those of normal CgA group (n = 207, 58%) (All P < 0.05). In survival analysis, median overall survival was shorter in high CgA group (7.9 vs. 11.8 months, p = 0.018). In subgroup analysis according to clinical stage, overall survival could not represent any statistical difference among patients with resectable and locally advanced stage. However, in patients with metastatic stage, overall survival was significantly shorter in high CgA group than those with normal CgA group (6.2 vs. 7.0 months, p = 0.025).

In univariate analysis, high CgA level, together with age, performance status, white blood cell count (WBC), albumin, pancreas head involvement, clinical stage, CEA, and CA 19-9 level, were associated with overall survival in all the enrolled patients (All p < 0.05). But, in multivariate analysis, only WBC, albumin, clinical stage, and CA 19-9 level were independent prognostic factor in pancreatic cancer patients.

Conclusion: The high level of CgA can predict poor survival in pancreatic cancer patients, especially in metastatic stage.

Keywords: Pancreas cancer, Chromogranin A.

**OP10-8**
Neoadjuvant Gemcitabine, S-1, and Intensity-Modulated Radiotherapy (IMRT) in Patients with Locally Advanced Pancreatic Adenocarcinoma (PDAC)

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Background: IMRT allows higher radiation doses to be focused to tumor while minimizing the dose to surrounding normal critical structures. Therefore, combination of intensive chemotherapy is expected. We evaluated the efficacy and safety of IMRT with gemcitabine and S-1 for locally advanced PDAC.

Methods: 31 patients with locally advanced PDAC were included, and classified into 2 groups, namely, Group A: borderline resectable (BR; 24) and unresectable without encasement (UR; 3), Group B: unresectable with encasement (URE; 4). Firstly, two times of gemcitabine (1000 mg/m2) was administered. After that, IMRT was delivered to tumor and swelled lymph nodes at a total dose of 50.4Gy in 28 fractions with chemotherapy of gemcitabine (600 mg/m2 d 1, 8) and S-1 (60 mg/m2 d 1–14). After chemoradiotherapy (CRT), the patients were reassessed for curative resection. The primary endpoint was survival, and the secondary endpoints were resection rate, response rate, local recurrence rate, disease free survival and toxicity.

Results: Grade 3–4 leukocytopenia and neutropenia occurred in 13 (42%) and 9 (29%), however, grade 3–4 gastrointestinal toxicity occurred only 1 (3%). 30 (97%) patients were successfully treated of CRT. CR was not observed. PR and SD were achieved in 8 and 14 patients. Seven patients of group A did not undergo pancreatectomy because of distant metastasis, 19 (70%) patients of group A underwent pancreatectomy. No patients of group B underwent pancreatectomy. 18 (95%) patients had R0 resection. Pathological effect, as defined by Evans classification, were grade I: 2 (11%), IIa: 7 (37%), IIb: 8 (42%), III: 1 (5%), IV: 1 (5%). 10 patients postoperatively relapsed distant metastasis, one patient relapsed locally recurrence. The median overall survival of all patients were 22.4 months.

Conclusions: IMRT with the chemotherapy of gemcitabine and S-1 is feasible as NACRT for locally advanced PDAC with excellent local control and less adverse events. However, more effective chemotherapy is needed to reduce distant metastasis.

Keywords: Pancreatic cancer, Gemcitabine, S-1, IMRT.
OP10-9
Prognostic Nomogram for Resected Pancreatic Adenocarcinoma in an Asian Population
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Background: A prognostic tool unique to patients with resected pancreatic adenocarcinoma of Asian ethnicity is lacking. American Joint Committee of Cancer (AJCC) TNM staging system has been shown to be non-discriminatory in prognostication when applied to patients with resected pancreatic adenocarcinoma.

Methods: The clinicopathologic data of 226 patients with pancreatic adenocarcinoma who underwent resection between 1998 and 2013 was reviewed retrospectively. Significant prognostic variables for overall survival identified in multivariate analyses were used to construct a nomogram.

Results: Post-operative carbohydrate antigen 19-9 (CA 19-9) >120 U/ml, lymph node ratio >0 and poorly differentiated/undifferentiated tumour grade were negative predictors of survival. The concordance index for the prognostic nomogram was 0.717 in comparison to the concordance index of AJCC which was found to be 0.615.

Conclusion: AJCC staging system alone is inadequate to prognosticate patients with resected pancreatic adenocarcinoma. Further validation of this prognostic nomogram in a larger dataset is needed.

OP11-1
Effects of Arsenic Trioxide on the Expression of Ezrin in Hepatocellular Carcinoma
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Objective: To investigate the effects of arsenic trioxide (As2O3) on the expression of ezrin and serum alpha-fetoprotein (AFP) level in hepatocellular carcinoma (HCC).

Methods: A total of 24 patients (20 males and 4 females) with resectable HCC were treated with venous injection of As2O3 for 14 days (10 mg/d). The ezrin expression and serum AFP levels were assessed before and after treatment respectively.

Results: The serum AFP were 325.5 ng/l before treatment and 278.6 ng/l after treatment, with statistical significant difference (Z = –2.360, P < 0.05). Negative, weak positive and strong positive of ezrin expression were in 11, 7 and 6 cases respectively before As2O3 treatment, and 17, 5, 2 cases respectively after the treatment. Statistical differences were obtained (χ² = 5.619, P < 0.05). The high serum AFP levels (AFP ≥500 ng/l) and high expression of ezrin correlated significantly (χ² = 8.080, P < 0.01).

Conclusion: Ezrin expression in HCC cells can be significantly down-regulated by As2O3, and the growth, recurrence and metastasis of tumor can be inhibited.

Keywords: Arsenic trioxide, Hepatocellular carcinoma, Ezrin.

OP11-2
Percutaneous Alcohol Treatment for Large Inoperable Hepatocellular Carcinoma
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Background/Aims: Ethanol alcohol as an ablating treatment for hepatocellular carcinoma was well known long time ago. Its use in high volumes for large hepatocellular carcinoma percutaneously is not well known. We aimed to assess the safety and some short term outcomes of percutaneous administration of ethanol alcohol for the treatment of large hepatocellular carcinoma.

Method: Retrospective uncontrolled and non-randomized study. Adult patients with tumors of diameters >5 centimeters during the period May 2012 to December 2014 attending to our clinic, were included. They were subjected to perfusion and injection of various amounts of alcohol in a weekly serial sessions percutaneously under ultrasound guidance until their lesions were fully saturated and no vascular activity was detectable. Three months later the patients; their livers and their tumors were compared to the pre-alcohol treatment parameters.

Results: The 23 adult patients received a mean alcohol volume of 76 ± 62.2 mls, (range 12 to 250 mls). No immediate intra-procedural or one month mortality or serious hemodynamic instability were reported. The overall mortality rate during the period of study was 8.7% (n = 2), both of them were due to progressive end-stage liver disease. The incidence of Common Toxicity Criteria for Adverse Effects grade 3/4 was 52% (n = 12) and grade 4 was 13% (n = 3). Improvement in the Eastern Cooperative Oncology Group performance status score was noticed in 60.9% (n = 14) of the patients, at the end of the treatment sessions. Complete tumor vascular inactivity, three month tumor growth arrest was observed in 60.9% (n = 13) and 78.3% (n = 18) of patients, respectively.

Conclusion: This study showed that Ethanol alcohol can still be used as a safe alternative treatment for large hepatocellular carcinoma with good short term benefits.

Keywords: Percutaneous alcohol, Ethanol alcohol, Hepatocellular carcinoma.
**OP11-3**

**Elevated Preoperative Serum CEA Levels in Patients with HCC is Associated with Prognosis**

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**Introduction:** EMT plays an important role in tumor malignancy including metastasis and invasion, and the elevated tumor markers has been reported as a prognostic factor in several malignant tumor. In this study, we evaluated the significance of serum CEA levels for prognosis. In addition, increased serum CEA reflected Carcinoembryonic antigen-related adhesion molecule 1 (CEACAM1) expression, moreover related to EMT-related factors (E-cadherin, Vimentin), microvessel density (MVD) by CD34 in HCC.

**Methods:** One hundred ninety patients with HCC underwent radical resection were enrolled. Preoperative serum CEA (cut-off value: 5.0 ng/ml) level was measured and divided into two groups (high and normal), and evaluated the relationships to clinicopathological factors, CEACAM1 expression, EMT-related factors, and MVD.

**Results:** In disease-free survival (DFS) rate was significantly worse in the CEA high group (5 DFS rate: <5 66.0% vs. ≥5 46.3%, p < 0.01). In multivariate analysis, high CEA levels (HR2.42, 95% CI 1.31–4.30 p < 0.01), multiple tumors (HR2.14, 95% CI 1.27–3.55 p < 0.01) were identified as independent recurrence prognostic markers. Furthermore we examined the correlation with CEA levels for prognosis. In addition, increased serum CEA reflected Carcinoembryonic antigen-related adhesion molecule 1 (CEACAM1) expression, EMT-related factors (E-cadherin, Vimentin), microvessel density (MVD) by CD34 in HCC.

**Conclusion:** Serum CEA levels is associated with EMT, tumor angiogenesis, the promising prognostic marker after hepatectomy.

**Keywords:** Hepatocellular carcinoma, Sarcopenia, Performance status, Survival.

**OP11-4**

**Sarcopenia as a Predictor of Survival and an Objective Measure of Performance Status in Hepatocellular Carcinoma**

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**Background/Aim:** The prognostic impact of sarcopenia has not been clearly demonstrated in patients newly diagnosed with hepatocellular carcinoma (HCC), especially those without symptoms.

**Methods:** Area of skeletal muscle and abdominal fat were measured at L3 level of computed tomography scan in 132 patients newly diagnosed with HCC between Jan 2007 to Jun 2011. Sarcopenia was defined as L3 skeletal muscle index of ≤52.4 cm²/m² for male and ≤38.5 cm²/m² for female. Baseline data were analyzed to determine the effect of sarcopenia on overall survival (OS) using the univariate and Cox multivariate analyses in overall and propensity-score matched cohorts. The impact of sarcopenia in asymptomatic vs. symptomatic patients was evaluated.

**Results:** Sarcopenic patients (32 out of 132) were older (65.3 vs. 57.0 years old) and had lower body mass index (21.0 vs. 24.0 kg/m²), total fat (55.7 vs. 68.0 cm²/m²), and subcutaneous fat (21.9 vs. 29.2 cm²/m²) area. The presence of sarcopenia dichotomized patients with regard to OS (median 41.2 vs. 13.8 months, P = 0.001). Multivariate analysis found that sarcopenia (hazard ratio [HR], 2.15, P = 0.008), alpha-fetoprotein (HR, 2.79, P = 0.004), Child-Pugh stage (HR, 2.38, P = 0.017), infiltrative tumor (HR, 2.29, P = 0.021), and BCLC stage (P < 0.001) were predictive of OS. In a propensity-score matched cohort, sarcopenia (HR, 5.50, P = 0.027) was the only predictive factor. In particular, asymptomatic patients with sarcopenia had a poor OS than patients without sarcopenia (median 69.6 vs. 22.2 months, P < 0.001), while no significant impact in symptomatic patients (median 17.2 vs. 9.7 months, P = 0.26). Subdividing asymptomatic patients of BCLC A and B stages according to sarcopenia status improved the predictive ability of staging system (c-index, 0.87 vs. 0.67, P < 0.001).

**Conclusions:** Sarcopenia is an independent prognostic factor in patients newly diagnosed with HCC, especially those without symptoms. Subdividing BCLC A and B stages according to sarcopenia status showed a better stratification.

**Keywords:** Hepatocellular carcinoma, Sarcopenia, Performance status, Survival.

**OP11-5**

**O-GlcNAc Transferase Promotes Fatty Liver-Associated Liver Cancer through Regulating Palmitic Acid to Activate JNK and NF-κB Pathways**

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**Background/Aims:** O-GlcNAc transferase (OGT) is a unique glycosyltransferase. Data from TCGA showed that OGT was up-regulated in non-alcoholic fatty liver disease associated hepatocellular carcinoma (NAFLD-HCC) patients. In this study, we aim to investigate the functional role of OGT in NAFLD-HCC and its potential clinical implication.

**Methods:** The biological function of OGT was determined by proliferation, clonogenicity, migration, invasion and subcutaneous xenograft tumor formation experiments. OGT target pathways were identified by promoter luciferase assay, DNA binding activity assay and Western blot. Liquid chromatography coupled
were 85.2%, 64.9%, 52.5% for patients treated with surgical resection or TACE. The 1-, 3-, 5-year overall survival were 80.7%, 48.1%, 46.8% for patients treated with surgical resection, and 34.1%, 13.1%, 0% for patients treated with TACE.

The evidence in selecting best treatment strategy in BCLC B/C were largely retrospective, however, systemic reviews showed that most studies favors more aggressive treatment than BCLC recommend. In recently published paper by east-west study group, even BCLC C tumor with macrovascular invasion may benefit from surgical resection.

**Conclusions:** RCTs are urgently needed to stratify BCLC B/C patients to identify best treatment strategy for patients with HCC of different stages.

**Keywords:** Hepatocellular, Carcinoma, BCLC.

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**OP11-7**

**Clinical Value of Percutaneous Intraductal Radiofrequency Ablation Combined with Biliary Metal Stenting in Treatment of Bile Duct Carcinoma with Obstructive Jaundice**

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**Objective:** To investigate the safety and feasibility of percutaneous intraductal radiofrequency ablation combined with biliary metal stenting in treatment of biliary carcinoma with obstructive jaundice.

**Method:** This study included 38 patients diagnosed as bile duct carcinoma presented with obstructive jaundice, who were treated in the First Affiliated Hospital of Zhengzhou University from January 2013 to June 2015. They (test group) underwent percutaneous intraductal radiofrequency ablation combined with metallic biliary stent placement. The other 20 cases (control group) received the metallic biliary stent placement alone after successful percutaneous transcatheter cholangiography. Operative complications and remission of jaundice were observed, and the stent patency at 3 and 6 months postoperation was evaluated and compared between the two groups.

**Result:** All patients were followed completely by outpatient or telephone. The stent patency rate at 3 months after operation was 100% in the test group and 75% in the control group (X² = 2.884, P = 0.203), and the stent patency rates at 6 months w as 85.2% and 25.0%, respectively (X² = 6.518, P = 0.02). During follow-up, 1 case in the test group died of liver function failure at 5 d after operation. 2 cases in the control group died of Neoplasm Metastasis and progression at 68 d, 85 d postoperation, and 1 case died of disseminated intravascular coagulation at 142 d.

**Conclusion:** Percutaneous intraductal radiofrequency ablation is safe and feasible in treatment of primary biliary carcinoma with obstructive jaundice and the preliminary efficacy in prolonging the patency of self-expanding metallic stent is satisfactory. However, the therapy needs to be further verified via large-sample randomized controlled studies.

**Keywords:** Biliary carcinoma, Obstructive jaundice, Catheter intraductal radiofrequency ablation, Stent.
OP11-8
Liver Surgery in Alveolar Echinococcosis: Can We Define Standards?
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Background: In humans, alveolar echinococcosis (AE) effecting and slowly destroying the liver is a serious helminthic disease. Treatment options are a complete surgical resection with a safety margin of at least two centimeters followed by a longterm medication. In our study we analyzed retrospectively the influence of the safety margin and the effect of the post-operative anti-infective prophylaxis on the long-term outcome of patients, which have been operated in curative intention.

Material and Methods: 92 patients with liver resections in a curative intent were evaluated regarding the distance of the resection margin, the duration of medical therapy with benzimidazole derivates, and the further course of AE.

Results: All evaluated patients were alive. Median follow up after the surgical procedure was 8.3 years. 12 patients had a safety distance of 2 centimeters or more, 16 patients between 10 and 19 mm, 21 patients between 1 and 10 mm, and 10 patients 1 mm. In 33 patients the affected liver was resected without any safety margin. Recurrence of AE was observed in 15 patients between 4 months and 24 years after the initial operation. Minimal distances of larval tissue to resection margins of patients with recurrent disease were: 13 patients without a safety margin, one patient with 1 millimeter and one patient with 13 millimeter safety margin. In all patients except one with recurrent AE the postoperative therapy with benzimidazole derivates was interrupted.

Conclusion: A safety margin of at least one millimeter in combination with an anthelminthic treatment seems to offers a good chance of long time disease freeness. The anti-helminthic medication should be continue after resections in curative intention for at least two years. Since a recurrence of the disease was observed even after 24 years after the initial operation, long-term monitoring of patients seems to be necessary.

Keywords: Liver resection, Alveolar echinococcosis, Safety margin.

OP11-9
Should Energy Devices Be Associated with Clamp Crushing Method to Improve Liver Parenchymal Transection?: A Two-Center Randomized Controlled Trial
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Background: Previous randomized controlled trials failed to demonstrate the usefulness of energy devices in combination with conventional clamp crushing method for reducing blood loss during liver transection. We conducted this trial to verify the usefulness of the ultrasonically activated device (UAD) and bipolar vessel sealing device (BVSD).

Method: Patients scheduled to undergo hepatectomy at the University of Tokyo Hospital or Nihon University Itabashi Hospital were eligible for this parallel-group single-masked (participants only) randomized study. Patients were randomized by the minimization procedure, and assigned to the control group (no energy device used), UAD group, or BVSD group for liver transection at a 1:1:1 ratio. The primary endpoint was the blood loss amount during liver transection. Outcomes were first compared between the control group and energy device groups. Pairwise comparisons among three groups were conducted only when the energy device group was superior to the control group in that outcome. Trial Registry: www.umin.ac.jp/ctr/index.htm; Identifier: C000008372.

Result: Between July 2012 and May 2014, 380 patients were enrolled. Among these, we analysed 116 in the control group, 122 in the UAD group, and 123 in the BVSD group. Median blood loss amount during liver transection was lower in the energy device group (190 ml, range: 0–3575) than in the control group (230 [3–1570] ml; P = 0.048). Pairwise comparisons revealed that the BVSD group was superior to the control group in the endpoint (P = 0.043).

Conclusion: The use of energy devices reduced blood loss during liver transection. The BVSD seems to be more effective.

Keywords: Energy device, Liver transection, Bipolar vessel sealing device, Ultrasonically activated device.
Objective: To clarify the appropriateness of size definition of the word giant for the hemangioma of the liver.

Summary Background Data: Four different size (4, 5, 8 and 10 cm) can be found in the literature to define an hemangioma of the liver as giant. The fluctuancy of this definition do not contribute to a clear indication for surgery in relation to the size.

Methods: A review of literature between 1970 and 2014 have been done. Patients over 18 years, number of hemangiomas, size criteria for classification, mean size and range of the size of hemangiomas, number of asymptomatic patients, number of symptomatic patients, types of symptoms have been considered for the present study. We have divided the hepatic hemangiomas in four groups: <5 cm, between 5–9.9 cm, between 10–14.9 cm and more than 15 cm.

Results: From 12920 article only 34 articles addressed the inclusion criteria. From 4587 patients analyzed only 1972 (43.0%) were giant hemangioma (>4 cm). They have been newly classified as following: 154 patients (30%) less than 5 cm (small), between 5 cm and 9.9 cm (large) were 182 (35.5%), between 10 and 14.9 cm (giant) were 75 patients (14.6%) and more than 15 cm (abnormal) were 102 patients (19.9%). The asymptomatic patients were 807 (40.8%) and the symptomatic patients were 780 (39.5%). The asymptomatic patients, types of symptoms have been considered for the present study. We have divided the hepatic hemangiomas in four groups: <5 cm, between 5–9.9 cm, between 10–14.9 cm and more than 15 cm.

Conclusion: This study, suggests that 10 cms seems to be the size at which the term ‘Giant’ justifies the definition for the cavernous hemangioma of the liver. The definition of giant do not implies the indication for surgery. The surgery have to be done exclusively in case of proved symptoms. On the opposite the patients could be observed.

Keywords: Hemangiomas, Liver, Giant.

OP12-1
Preoperative Combined Chemoradiotherapy for Esophageal or Junctional Cancers – 10 Years Review at SKMCH & RC

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Background: The purpose of this study was to analyze treatment outcome in patients with esophageal and junctional cancers treated at Shaukat Khanum Memorial Cancer Hospital and Research Centre Lahore, Pakistan.

Methods: We retrospectively reviewed 283 patients treated with curative intent between January 2002 and October 2012. Median age was 55 years (range 18–82 years). There were 56% males and 44% females. 78% of the patients had squamous cell carcinoma, 21.5% had adenocarcinoma and 0.5% had small cell histology. 56% of the patients had lower thoracic tumors followed by middle thoracic (20%) and junction cancers (17.5%). Clinical stage at presentation; stage IB, IIA, IIB, IIIA, IIIB and IIIC in 5%, 2%, 34%, 35%, 1.5% and 2.1% of the patients respectively. Out of 283 patients, 216 patients had induction chemotherapy. Cis/SFU was the most common regimen used (81%). Concurrent chemoradiotherapy was given to 263 patients and 12 patients had radiotherapy alone. 135 patients had surgery. 77% of patients had transhiatal esophagectomy.

Results: Following Induction chemotherapy, 5% of the patients had Grade III toxicities (Nausea/vomiting and Neutropenia). Concurrent Chemoradiotherapy was well tolerated. The 5-year overall survival (OS) and progression free survival (PFS) of whole group was 38% and 30% respectively. In patients who underwent surgery, the 5-year OS and PFS was 43% and 38% respectively. In patients who did not underwent surgery, the 5-year overall and PFS was 33% and 15% respectively. Pathological complete response (pCR) was seen in 36.3% of patients. pCR with Cisplatin/SFU regimen was seen in 39.6% of patients. Recurrence was seen in 24.5% of patients, among which 62% of the patients failed distantly.

Conclusion: Preoperative chemoradiotherapy followed by surgery improved survival among patients with potentially curable esophageal or junctional cancers.

Keywords: Chemoradiotherapy, Esophageal.

OP12-2
Neoadjuvant Chemotherapy in Locally Advanced Gastric Cancer: A Retrospective Tertiary Care Centre Experience

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Background: The role of perioperative chemotherapy for gastric cancer has been established for gastric cancers in their advanced stage. We analysed the benefit of perioperative chemother-
apy in locally advanced gastric cancer treated at our centre during the period of 2014–2015.

**Materials and Methods:** Consecutive 136 patients with locally advanced gastric cancers were offered neoadjuvant chemotherapy during the period of 2014–2015. All the patients received 3–4 cycles of neoadjuvant chemotherapy (NACT) with epirubicin, capecitabine and oxaliplatin (EOX) based regimens and D2 surgical resection.

**Results:** Median age of the cohort was 54 yrs (21–79). Male to female ratio was 3:1 (102/34). Of 136 patients, 117 (86%) completed the scheduled number of cycles of NACT while it was stopped in 6 patients (4.4%) due to toxicity. There was death of 1 patient during NACT while 12 patients (8.8%) defaulted during it. 92 patients (74.2%) underwent surgical resection with a R1 resection in 13 patients (10.5%). 18 patients (14.6%) were deemed inoperable after NACT of which 10 patients (6.5%) had progressed including development of intrahepatic disease. 4 patients refused surgery and were continued on palliative chemotherapy while 9 defaulted prior to surgery. 74 patients (80.4%) completed adjuvant chemotherapy after surgical resection. The median PFS of the patients receiving NACT was 22.6 months with a 2 yr PFS of 50%. The median follow up duration was 14.8 months. The median OS was not reached with a 2 yr OS of 81%. 23 patients (18.5%) had Gr ¾ toxicity with NACT and toxicity of S-1 and paclitaxel (S1/PTX) in patients with relapsed or refractory esophageal squamous cell carcinoma who had been previously treated with docetaxel, cisplatin and 5-fluorouracil chemotherapy.

**Conclusion:** Compared with results of MAGIC trial with majority of D1 resections, perioperative chemotherapy followed by higher rate of D2 surgical resection and improved survival. It does not increase treatment-related morbidity and mortality.

**Keywords:** EOX, Perioperative chemotherapy, Gastric cancer, D2 resection.

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**OP12-3**

**H. Pylori Negative Gastric Cancer**

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**Background:** Although the prevalence of H. pylori infection has gradually decreased recent two decades, the incidence of gastric cancer has not decreased. The incidence of H. pylori negative gastric cancer (HPNGC) has been reported as below 10% before 2010. The tumor characteristics of HPNGC have been evaluated but host habitual factors have not been known. We evaluated the incidence and host habitual factors of HPNGC in South Korea.

**Methods:** A total of 394 gastric cancer patients underwent rapid urease test and serum H. pylori IgG test and completed the questionnaires for personal history and diet habits from March 2014 to Oct 2015 in a single medical center. H. pylori positive gastric cancer (HPPGC) was defined as current H. pylori infection and HPNGC was defined as negative current infection and negative serum HP IgG and no history of H. pylori eradication. Past infection was defined as current H. pylori negative with presence of H. pylori eradication or positive serum H. pylori IgG.

**Results:** The portion of HPNGC, HPPGC, and past infection was 34% (n = 134), 50% (n = 198), and 16% (n = 62), respectively. HPNGC was related with old age comparing to HPPGC (64.7 yr vs. 61.9 yr, P = 0.025) and early menopause (48.0 yr vs. 50.8 yr, p = 0.014). Low fruit diet was higher in HPNGC than HPPGC (59.4% vs. 47.9%, p = 0.041) and low soy-tofu diet was also higher in HPNGC than HPPGC (31.6% vs. 19.7%, p = 0.014). In multivariate analysis, age increased the risk of HPNGC (odd ratio [OR] 1.03, 95% confidence interval [CI] 1.01–1.05), whereas high fruit diet (OR 0.58, 95% CI 0.36–0.94) and high soy-tofu diet (OR 0.60, 95% CI 0.30–0.99) decreased the risk of HPNGC.

**Conclusions:** The incidence of HPNGC was high comparing to previous reports and they are related to increasing age, low fruit diet, and low soy-tofu diet comparing to HPPGC.

**Keywords:** Gastric cancer, Helicobacter.
OP12-5
Long Non-Coding RNA LUCAT1 Promotes Esophageal Tumorigenesis by Controlling Ubiquitination and Stability of the Maintenance DNA Methyltransferase DNMT1
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Background/Aim: Esophageal squamous cell carcinoma (ESCC) is a lethal malignant tumor whose pathophysiology is poorly understood. In this study, we tried to find a novel long non-coding RNAs (lncRNAs) which was related with carcinogenesis of ESCC and to find mechanism.

Methods: We assayed the lncRNA expression level in esophageal cancer tissues by real-time PCR, and defined the biological functions by flow cytometry and Western blot and MS-PCR.

Results: Among lncRNAs, LUCAT1 was significantly over-expressed in ESCC compared to adjacent normal tissues (p < 0.001) in RNA-seq. In 28 ESCC patients, the expression of LUCAT1 was significantly up-regulated in ESCC compared to adjacent normal tissues (p = 0.018). The expression of LUCAT1 in adjacent normal tissue of ESCC patients was higher than that of normal tissues with non-erosive esophagitis. Moreover, cell proliferation, migration and invasion were markedly inhibited by LUCAT1 siRNA in KYSE-30 cell line. DNMT1 stability is association with LUCAT1 expression level, which may regulate DNA methylation.

Conclusions: Collectively, our results demonstrate that deregulation of DNMT1-associated IncRNA LUCAT1 contributes to aberrant DNA methylation and gene expression during esophageal tumorigenesis.

Keywords: Esophageal squamous cell cancer, LUCAT1, Long noncoding RNAs, DNA methylation, DNMT1.

OP12-6
Tissue Characterization of Antigen Processing Machinery Components and CD8+ T-Lymphocytes in Primary Gastric Cancer
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Background: Gastric cancer (GC) is the fifth most commonly diagnosed cancer and the third most common cause of cancer related death worldwide. Cellular malignant transformation is associated with down-regulation of the components of antigen processing machinery (APM) of human leukocyte antigen (HLA) class I. This may cause defects in peptide generation, translocation and/or loading onto b2-microglobulin-HLA class I heavy chain (HC) complexes. These defects are clinically relevant, since they are frequently associated with disease progression in other neoplasms. Aim of this preliminary work is to evaluate these topics, since the resulting information may contribute to assess the therapeutic efficacy of T cell-based immunotherapy for the treatment of GC.

Methods: We included 20 consecutive subjects who underwent surgical treatment for primary GC (11 males and 9 females with a mean age of 65 years; range: 47–78 years). GC and autologous adjacent non-malignant tissues were stained with a panel of monoclonal antibodies, which recognize HLA class I APM components (i.e. HLA class I heavy chain, b2-microglobulin and tapasin). To assess the functional significance of changes in HLA class I APM component expression in GC, the immunohistochemical staining was semi-quantitatively compared with the extent of CD8+ cytotoxic T-lymphocyte infiltrate.

Results: We found that expression of APM proteins is highly variable among GC. Although the limited cohort of patients, tapasin (i.e. an APM protein dedicated to the maturation of HLA-I) was found down-regulated in most of the investigated neoplastic tissues, compared to adjacent non-tumoral tissues.

Conclusion: Our preliminary study shows that HLA class I APM component down-regulation is found in GC cells. Its association with T-cell infiltrate is compatible with the possibility that GC cells are recognized by CD8+ T lymphocytes. If so, GC should represent an attractive target to apply T cell-based immunotherapy.

Keywords: Gastric cancer, HLA class I, CD8+ cytotoxic T-lymphocyte infiltrate, APM components, Immune response.

OP12-7
Retrospective Analysis of Prospective Database Assessing the Efficacy and Tolerability of First Line Docetaxel Based Chemotherapy Followed by Docetaxel or Capecitabine Maintenance in Non-Progressive, Metastatic Stomach Adenocarcinoma-Experience from a Tertiary Referral Centre
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Background/Aim: Docetaxel-based chemotherapy (DCT) has been a standard of care in advanced gastric cancer (AGC). We aimed to determine the efficacy and tolerability of DCT at our tertiary care centre and to generate the hypothesis for possible role of maintenance (MCT).

Materials and Methods: This is retrospective analysis of 214 consecutive AGCs who received DCT from May 2013 to December 2015. The efficacy and survival benefit with DCT and the utility of MCT with docetaxel (60 mg/m² every 21 days)/Capecitabine (1000 mg/m² twice a day) in these patients.

Abstracts
Dig Surg 2016;33(suppl 1):1–232
DOI 10.1159/000448791
Results: Out of 214 patients, 52.8% (113) patients showed clinical benefit at the end of 6–8 cycles. Median overall survival (OS) and progression free survival (PFS) of evaluable patients were 9.2 months and 7.2 months respectively. Toxicity assessment showed febrile neutropenia in 12.6%, Hand foot syndrome in 20%, Peripheral neuropathy in 4.2% and diarrhoea in 15.4%. Overall 42% patients had one or more G3/G4 toxicities. Of 113 patients, MCT with docetaxel in 51 patients, Capecitabine in 26 patients whereas 36 were observed as per the physician’s discretion or patient preference. The median PFS with docetaxel maintenance was 7.3 months. The median PFS with Capecitabine maintenance was 6.8 months. There was no difference in OS with respect to the maintenance arm vs. observation as equal number of patients were eligible and considered for second line chemotherapy on progression. The PFS analysis favoured docetaxel maintenance compared to observation arm (Median PFS Docetaxel vs. Observation – 7.3 months vs. 5.4 months; p value – 0.06).

Conclusion: Docetaxel based chemotherapy has encouraging results with acceptable toxicities in our patients with AGC. Survival benefit with maintenance docetaxel therapy is hypothesis generating, need to be evaluated in randomized trials with large sample size and quality of life assessments.

Keywords: Advanced gastric cancer, Docetaxel, Maintenance, Capecitabine.

OP12-8
Identification of AQP3 and CD24 as the Biomarkers for Carcinogenesis of Gastric Intestinal Metaplasia
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Objective: Gastric intestinal metaplasia (GIM) is considered to be a precancerous lesion of gastric cancer (GC) and to play a pivotal role in gastric carcinogenesis. CD24, LGR5 and Ki67 have been reported to be expressed in GIM tissues. Previously, we have demonstrated that aquaporin 3 (AQP3) was expressed specifically in the membrane of goblet cells, and AQP3 expression correlated with the severity of GIM positively. However, the relationship of AQP3 expression with the GIM classification, its cross-relationship with other proteins, and their potential roles in gastric tumorigenesis from GIM remains unknown.

Methods: Sixteen patients diagnosed with GC of intestinal type located in the lesser curve of the antrum were consecutively enrolled in this study. GIM was determined according to the updated Sydney system, the classification of GIM was determined via HID-AB stain, and AQP3, CD24, LGR5 and Ki67 expression were determined by immunohistochemistry.

Results: Type III GIM was more prevalent in tissues adjacent to GC (P < 0.001) and displayed a remarkable association with the severity of GIM positively (P = 0.009). CD24 was found to be expressed in the parts with GIM, but LGR5 and Ki67 were found to be expressed in tissues regardless of the presence of GIM. AQP3 showed significant correlation to the type III GIM (P = 0.027). CD24 expression was correlated with the marked GIM (P < 0.001) and incomplete GIM (P = 0.034). LGR5 and Ki67 presented no association with the grade and classification of GIM although significant association of LGR5 with Ki67 expression was found in GIM.

Conclusions: These findings further establish the role of AQP3 in the gastric tumorigenesis, and CD24, rather than LGR5 and Ki67, may be involved in this progression. The present study improves our understanding of the mechanism of carcinogenesis from GIM to GC, and may provide for the first time the precise strategy for the surveillance of GIM.

Keywords: Gastric carcinoma, Gastric intestinal metaplasia, Aquaporin 3, CD24, Inflammatory carcinoma transformation.

OP13-1
Safety and Morbidity of Pancreaticoduodenectomy for Elder Patients
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Background and Aim: Pancreaticoduodenectomy is one of surgeries which has biggest invasiveness to patients. We aimed to analyze the morbidity and mortality pf pancreaticoduodenectomy for the patients older than 80 years old and to clarify the essential point to operate pancreaticoduodenectomy for elder patients.

Method: We performed 151 pancreaticoduodenectomy during 2009 to 2015. The indication of surgery is decided as performance Status 0–2, and not to have any severe cardio-pulmonary diseases. Age of patients is relatively considered with the other general condition. We compared the patients older or equal to 80 years old (n = 16) and the patients younger than 80 years (n = 135) old.

Result: Patients’ age, background diseases, diseases for surgery and BMI didn’t have any significant difference between both group (elder group and younger group). Performance status was lower in elder group than younger group (p = 0.002), time of surgery was longer in elder group (median= 526 min) than younger group (median= 447 min) (p = 0.008), there was more blood loss in younger group (700 g) than elder group (490 g) (p = 0.012). The number of cases with portal vein resection and reconstruction was 17 in younger group and 0 in elder group. There was no mortalities in both groups, and there is no significant difference at hospital days between both groups. The rate of morbidity were 43.8% (7 cases) in elder group and 38.5% (52 cases) in younger group and there was no significant difference. More pneumonia after surgery was occurred in elder group (12.5%, 2 cases) than younger group (1.5%, 2 cases).

Conclusion: We achieved similar morbidity rate in elder group with younger group by severely selecting patients depend on their general condition, and perform low invasive surgery. But there are morbidities particular in elder patients such as pneumonia, so that we need careful pre- and post-operative management.

Keywords: Pancreaticoduodenectomy, Elder patient.
OP13-2
Prognostic Relevance of the Timing of Initiating and the Completion of Adjuvant Therapy in Patients with Resected Pancreatic Ductal Adenocarcinoma
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Background: Although role of adjuvant therapy in patients with pancreatic ductal adenocarcinoma (PDAC) is established, its optimal timing and duration is still controversial.

Methods: The study included 311 patients with PDAC who underwent curative resection followed by adjuvant therapy. We analysed survival data according to initiation and completion of adjuvant therapy.

Results: There were no differences in 5-year overall survival (OS) (32.8% vs. 35.4%, p = 0.539) and disease-free survival (DFS) rates (26.2% vs. 23.3%, p = 0.865) between early (≤6 weeks) and late (>6 weeks) initiation of adjuvant therapy. However, the 5-year OS (42.6% vs. 22.2%, p < 0.001) and DFS (29.2% vs. 18.4%, p = 0.042) rates were significantly greater in completion compared with incompletion of adjuvant therapy. Multivariable analysis revealed that incomplete adjuvant therapy was an independent prognostic factor for decreased OS (p = 0.001; hazard ratio 1.850; 95% confidence interval 1.266–2.702).

Conclusion: The results show that complete adjuvant therapy is a more important prognostic factor than early initiation for improving the survival of patients with resected PDAC.

Keywords: Pancreatic ductal adenocarcinoma, Adjuvant therapy, Survival, Recurrence.

OP13-3
Management of Recurrent Pancreatic Cancer after Surgical Resection: Systematic Review, Evidence Mapping, and Meta-Analysis
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Background: Although almost patients with surgically resected pancreatic cancer (PC) experience recurrence, the optimal treatment option of recurrent PC is still unclear. Numerous studies have been reported about this issue, but all the scattered evidences are too small and heterogeneous to reach a conclusion. The aim of this systematic review is to perform ‘evidence mapping’ and subgroup meta-analysis.

Method: In regards to local recurrence and metastatic recurrence respectively, four treatment options including re-operation (ReOP), chemotherapy (CTx), radiotherapy (RT), best supportive care (BSC) were searched from Medline, Embase, Cochrane library, Scopus and Web of Science from 1976 to April 30, 2016. To visualize the mapping of evidence, we established a web-based mapping tool (http://plotting-e-map.com) and used it in the treatment options with selected study types, subgroup meta-analyses were conducted using overall survival as a primary endpoint.

Results: Among 12,040 studies detected, a total of 162 studies were included. In locally recurrent PC, overall 126 studies (39 of ReOP, 40 of CTx, 37 of RT, and 10 of BSC) were included. Median overall survival (OS) of each treatment option was 16.1 months (95% CI 4.9–22.1, I2 52%) for ReOP, 14.9 month (95% CI 7.5–18.9, I2 63%) for CTx, 13.8 months (95% CI 5.6–17.0, I2 59%) for RT. In metastatic recurred PC, overall 36 studies (10 of ReOP, 22 of CTx, no RT, 4 of BSC) were included. Median OS’s were 8.3 months (95% CI 3.6–11.2, I2 56%) for Re-OP, and 6.8 months (95% CI 4.1–9.5, I2 33%) for CTx.

Conclusion: During recent 40 years, evidences showed that re-operation for highly selected patients with locally and metastatic recurrent PC could be a considerable therapeutic option. However, since the heterogeneity among the studies is relatively high, more prospective and comparative studies about re-operation with multimodality treatment are needed.

Keywords: Recurrent pancreatic cancer, Surgical resection, Pancreatectomy, PPPD.

OP13-4
Transcriptome-Wide Analysis of Discriminating Gene Expression According to Metabolic Phenotype Based on PET Scan in Resectable Pancreatic Cancer; Systematic in Silico Analysis Using Public Database
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Introduction: Volume-based PET parameter, metabolic tumor volume2.5 (MTV2.5), can be used as a surrogate marker to estimate tumor biology and tumor recurrence prior to surgical resection. However different profile of gene expression between distinct metabolic phenotype which can be determined by PET scan remains unclear in pancreatic cancer microenvironment.

Method: Metabolic phenotypes, MTV2.5 high vs. low, were determined by MTV2.5 measurement for 18F-FDG PET scan in patients underwent surgical resection for pancreatic ductal adenocarcinoma (PDAC). Three patients in each group, MTV2.5 high vs. low, were randomly selected and formalin-fixed, paraffin-embedded PDAC tissues were obtained from institutional tumor bank. RNA extraction and quantification were performed and hybridization by affymetrix gene chip system was conducted subsequently. Comprehensive transcriptome-wide analysis and systematic in silico analysis using public database were performed.

Results: A total of 85 genes for differentially expressed genes (DEGs), 14 genes of up-regulation and 71 genes of down-regulation, were obtained by transcriptome-wide analysis (fig. 1). Landscape of gene expression by hallmark of cancer showed that significant upregulation of cancer-specific gene expressions were identified in MTV2.5 high group (fig. 2). Glycolysis among several metabolic pathways was remarkably up-regulated especially in MTV2.5 high group. Analysis for putative role of discovered gene expression profiles is ongoing.

Keywords: Recurrent pancreatic cancer, Surgical resection, Pancreatectomy, PPPD.
genes using molecular network analysis revealed altered and upregulated expression for cell adhesion, cytoskeletal regulation and mesenchymal transition. A set of DEGs combination predicted oncologic outcomes significantly using external validation cohort from public database.

**Conclusions:** Marked differences between each metabolic phenotype were identified by comprehensive transcriptome-wide analysis. MTV2.5 high group showed vigorous cancer-specific gene expression favoring cancer promotion and metastasis through epithelial mesenchymal transition than MTV2.5 low group. Validation of target molecules among DEGs showing discriminating expression in active metabolic phenotype is mandatory for developing new therapeutic agent.

**Keywords:** Pancreatic cancer, PET scan, Transcriptome.

**OP13-5**

**Association between Metformin Use and Mortality in Patients Receiving Curative Resection for Pancreatic Cancer: A Nationwide Population-Based Study**

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**Background:** Preclinical studies support an antitumor effect of metformin. However, clinical studies have conflicting results and metformin’s effect remains controversial. The aim of this study was to evaluate metformin’s effect on clinical outcomes in diabetic patients with pancreatic cancer treated with curative resection.

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![Hierarchial clustering and significant genes heatmap between MTV high vs. low (for Abstract OP13-5).](image-url)
Methods: We designed a nationwide population-based study. Data were provided from the Korea Central Cancer Registry and the National Health Insurance Service in the Republic of Korea. The study cohort consisted of 28,862 patients newly diagnosed with pancreatic cancer between 2005 and 2011. Metformin exposure was determined from prescription information from 6 months before the first diagnosis of pancreatic cancer to last follow-up. The main outcome was cancer-specific survival. Survival analyses were conducted using Kaplan-Meier methods and Cox proportional hazards model. Dose-response analyses were carried out using cubic spline regression model. All statistical tests were two-sided.

Results: A total of 764 patients underwent curative resection, met none of the exclusion criteria, and were prescribed oral hypoglycemic agents. The cancer-specific survival (5-year, 31.9% vs. 22.2%, \( p < 0.001 \)) was significantly higher in the 530 metformin users than in the 234 diabetic metformin non-users. After multivariable adjustments, metformin users had significantly lower cancer-specific mortality as compared with metformin non-users (hazard ratio, 0.727; 95% confidence interval, 0.611–0.868). Cubic spline regression analysis demonstrated significantly decreased cancer-specific mortality with increasing dose of metformin (\( p = 0.0047 \)).

Conclusions: This large study indicates that metformin may decrease cancer-specific mortality rates in diabetic pancreatic cancer patients receiving curative resection, independently of other factors, with a dose-response relationship.

Keywords: Pancreatic cancer, Resection, Diabetes, Metformin, Mortality, Nationwide database.

Fig. 2. Landscape of discriminating gene expressions according to metabolic phenotype (for Abstract OP13-5).
**OP13-6**

**Clinical Outcomes of FOLFIRINOX in Locally Advanced Pancreatic Cancer: A Single Center Experience**

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**Background:** Approximately, one third of pancreatic cancer patients have locally advanced status at diagnosis. Systemic chemotherapy or chemoradiotherapy is the main option for patients with locally advanced pancreatic cancer (LAPC). Recently, many studies have been investigating the efficacy of FOLFIRINOX (5-fluorouracil [5-FU], oxaliplatin, irinotecan and leucovorin) in LAPC patients. The aim of this study is to assess the clinical outcomes of FOLFIRINOX in patients with LAPC.

**Methods:** Patients with LAPC who received FOLFIRINOX as an initial chemotherapy were identified via the Seoul National University Bundang Hospital database warehouse retrospectively. Demographic characteristics, disease status, chemotherapy duration and cumulative relative dose intensity (cRDI), conversion to resection and clinical outcomes were reviewed. Resectability was determined based on National Cancer Comprehensive Network (NCCN) guidelines.

**Results:** Forty-seven LAPC patients between Apr. 2012 and Sep. 2015 were enrolled. The median age of the patients was 65 years (30–77 years). The median overall survival (OS) of total patients was 16.9 months. The number of treatment cycles administered was 12 (2–16) and cRDI was 66.7% (35.9–91.2%). Among them, 12 of 47 patients (25.5%) underwent surgery and R0 resection was achieved in 9 patients (75.0%). Only 2 patients received preoperative radiotherapy. The median OS of resected patients did not reach the 50% mark during the follow-up period compared with 13.3 months of OS in the patients without resection. Nine of 12 resected patients did not experience recurrence during the follow-up of 7.0 months (1.2–19.9 months). The cRDI was higher in resected patients versus others (72.4 vs. 66.2%). The median time to resection was 7.3 months (3.2–14.3 months).

**Conclusions:** FOLFIRINOX is considerable active regimen in patients with LAPC promising R0 resection rate. Future research should assess adequate duration and dose intensity of FOLFIRINOX and proper point of radiotherapy in the patients with LAPC to achieve higher rate of R0 resection.

**Keywords:** Locally advanced pancreatic cancer, FOLFIRINOX, Conversion to resectability.

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**OP13-7**

**5-Fluorouracil/Leucovorin/Irinotecan/Oxaliplatin (FOLFIRINOX) as Second-Line Chemotherapy in Patients with Metastatic Pancreatic Cancer**

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**Background:** Pancreatic cancer remains one of the most lethal cancers. We intended to evaluate the efficacy and toxicity of 5-Fluorouracil/Leucovorin/Irinotecan/Oxaliplatin (FOLFIRINOX) as second-line chemotherapy in patients with metastatic pancreatic cancer.

**Methods:** We retrospectively reviewed the data of 57 pancreatic cancer patients treated with second-line FOLFIRINOX chemotherapy between 2013 and 2015. Age, gender, origin of tumor, location of tumor, stage at diagnosis, Eastern Cooperative Oncology Group (ECOG) performance status, progression site, progression free survival (PFS), and overall survival (OS) were analyzed.

**Results:** The median age of the 57 patients (male, 56.1%) was 60.44 years (38–78). One patient (2.2%) had a confirmed complete response and 6 (13.0%) had stable disease, resulting in a rate of disease control of 15.2%. Disease control rate was higher in patients with good performance status (ECOG 0, 13.0% vs. ECOG 1 & 2, 2.2%). At the end of follow-up, 39 patients had progressed and 50 had died. Median PFS and OS were 1.7 and 4.3 months, respectively. Grade 3 or 4 toxicity was observed in 75.4% of patients. 13 patients (22.8%) experienced grade 3–4 neutropenia.

**Conclusions:** These results show the modest clinical activity regarding efficacy and the acceptable toxicity with the FOLFIRINOX regimen as a second-line chemotherapy for pancreatic cancer.

**Keywords:** Pancreatic cancer, FOLFIRINOX, Second line chemotherapy, Progression free survival, Overall survival.

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**OP13-8**

**LOXL2 Is Required for EMT and Migration in Pancreas Cancer**

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**Background:** Pancreatic cancer is known to aggressive disease. In cancer microenvironment, alteration of ECM composition in pancreatic cancer enhances the EMT of cancer cell and induces the metastasis and invasiveness. LOXL2 is an ECM related enzyme and catalyzes the formation of crosslinks in collagens and elastin. The aim of this study is reveal the novel role of LOXL2 at EMT in pancreatic cancer also tries to find the specific regulator of LOXL2 functional activity.
**Method:** Between June 2002 and December 2012, 84 patients underwent radical curative resection for pancreatic cancer at our hospital. Among them 80 patients were retrospectively reviewed. Human pancreatic cancer cell line Mia-Paca2, PANC1, AsPc1 and BxPc3 were used. The invasive potential was assessed in matrigel coated invasion chambers. Binding of transcription factor to specific promoter was performed by chIP and q-PCR.

**Results:** Among the 80 patients, 65 (81.2%) patients were positive for LOXL2. There was no statistical difference in clinicopathologic characteristics according to LOXL2 status. However, regarding recurrence patterns, LOXL2-positive tumors showed a significantly higher rate of distant recurrence. At in vitro study results, high expression of LOXL2 was observed in pancreatic cancer cells. Transient transfection of siLOXL2 exhibited significant changes in the expression of EMT markers. Importantly, silencing of LOXL2 resulted in a marked decrease in motility and invasiveness of pancreas cancer cells. Moreover, using chromatin IP, we figured out that the SP1 protein binds to LOXL2 promoter region and transcriptionally regulate the expression.

**Conclusion:** In conclusion, results from IHC analysis of tumors demonstrate that LOXL2 is an independent marker for metastatic disease and death of pancreatic cancer patients. Also, our in vitro study demonstrated that LOXL2 expression promotes EMT and invasiveness of pancreatic cancer cells. These findings suggest that LOXL2 could potentially be a valuable target for improvement of survival in patient with pancreatic cancer.

**Keywords:** Pancreatic cancer, EMT, ECM, LOXL2, Metastasis, Invasiveness.

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**OP14-1**

**How Often Do the Patient Repeat Screening Colonoscopy? A Study for Personalized Recommendation of Screening Colonoscopy Interval**

**Jung Min Lee, Eun Sun Kim, Sang Yup Lee, Byung Kwang Choi, Seung Han Kim, Jae Min Lee, Hyuk Soon Choi, Yoon Tae Jeen, Hoon Jai Chun, Hong Sik Lee, Chang Duck Kim**

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**Introduction:** Colorectal cancer (CRC) is the third most common cancer and the second most frequent cause of cancer death of female and fourth most of male in South Korea. Most CRCs develop through the adenoma-carcinoma sequence, which allows for screening and prevention of CRCs by screening colonoscopic examination and polypectomy. However, there have been limited data on personalized optimal time interval of next surveillance colonoscopic examination. The aim of our study is to recommend personalized interval by analysis of various clinical factors obtained by health care examination.

**Methods:** We enrolled the patients who underwent two times more voluntary, complete screening colonoscopy at health care unit of Korea University Medical Center Anam Hospital from July 1, 2004 to July 31, 2010. The clustering analysis using the partitioning around medoids algorithm and Hierarchial cluster were conducted including the 32 clinical, geographic and laboratory data. For each cluster, we then performed survival analysis that provides the probability of having polyps according to the number of days until next colonoscopy.

**Results:** Totally 8332 patients underwent screening colonoscopy, among them 625 patients performed repeat colonoscopy exam. 625 patients divided four clusters by clustering analysis. Adenoma detection at first screening colonoscopy was the most potent risk factor of develop of adenoma at next screening. Male gender, triglyceride (>134 mg/dl), and age (>56 years old) were significant factor for decision of the personalized interval of next screening colonoscopy. For example, male patient, who had adenoma at first screening, the predicted risk of adenoma is 50% after 25 months.

**Conclusion:** Our study can provide personalized time interval of next screening colonoscopy according to patients’ individual clinical data. Further study are necessary for validation our results.

**Keywords:** Screening colonoscopy, Interval.

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**OP14-2**

**Complications and Survival of Patients with Colorectal Cancer and Synchronous Liver Metastasis Depending on Surgical Strategy**

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**Background:** Surgery remains to be the most effective method able to extend the life of these patients. By this time a controversial treatment algorithm for these patients remains to be applied, including efficacy and safety of simultaneous resection of the primary tumor and liver synchronous metastases.

**Material and Methods:** Current study based on results of treatment of 152 patients with sm-CRC (pT1-4N0-2M1 cancer of the colon and pT1-3N0-2M1 rectal cancer). Simultaneous (group I) or staged (group II) surgery in the period from 2008 to 2016.

**Results:** Most serious complications (≥IIIa level) registered in a cohort of patients who underwent ‘major’ liver resection (20.9%), whereas the ‘minor’ resection = 4.8%, p = 0.007. The total duration of hospital stay was 18 ± 9.5 and 31 ± 7.8 respectively, for the first and second group, (p < 0.001). Moreover, a preference of simultaneous surgical treatment from the point of the duration of surgery, which was 367 ± 71.8 min in group I and 515 ± 119.1 min in the group of staged surgery p < 0.001 has been registered.

**Conclusions:** Simultaneous resection of ≤3 segments of liver with metastases and primary tumor of sm-CRC is a safe surgical strategy (complications ≥IIIa level was 4.8%). Simultaneous resection of <3 segments of liver with metastases and primary tumor of rectum significantly increase the complications ≥IIIa level (20.9%), p = 0.007. Simultaneous resection ensure reduction of hospital stay terms in 58.1% and duration of surgery in 71.3% (p < 0.001) patients.

**Keywords:** Colorectal cancer, Synchronous liver metastasis, Surgical strategy.
OP14-3
Surgical Outcome of Laparoscopic Colectomy for T4A Colon Cancer
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**Background:** For patients with T4a colon cancer, the risk of peritoneal dissemination after surgery remains unclear.

**Patients and Methods:** Seven-hundred and eleven patients with T3 or T4a colon cancer with 80 year of age or younger underwent curative resection (open surgery in 512 and laparoscopic surgery in 199) at four Jikei University hospitals between 2006 and 2012, whose the risk factors for peritoneal dissemination after surgery were evaluated retrospectively.

**Results:** Number of lymph node metastasis, postoperative liver metastasis and postoperative peritoneal dissemination in T4 a group were significantly greater than those with T3 group. Peritoneal dissemination after surgery developed in four patients (0.7%) in T3 group and six patients (5%) in T4a group. The risk factor of peritoneal dissemination consisted of serosal invasion (p = 0.003) and the number of lymph node metastasis (p = 0.007) by the logistic regression analysis. However, tumor diameter and surgery approach (laparoscopic vs. open) were not significant factors for peritoneal dissemination. There were no significant differences between postoperative relapse-free survival rates by the surgical approach within T3 or T4a group respectively.

**Conclusions:** Because of comparable postoperative peritoneal dissemination in T3 or T4a colon cancer by surgical approach (laparoscopic or open), laparoscopic surgery for patients with T4a colon cancer seems justified.

**Keywords:** Colon cancer, Laparoscopic surgery, Serosal invasion, Peritoneal dissemination.

OP14-4
Colorectal Liver Metastases: Survival and Prognostic Factors in 506 Patients
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**Aim:** Colorectal cancer (CRC) is one leading cause of cancer-related death worldwide and distant metastases determine an unfavorable prognosis. Surgical resection of colorectal liver metastases (CRLM) improves survival and provides the chance cure. The aim of this study was to prospectively analyze the outcome of patients with CRLM in a population-based manner, and thereby, to compare patients’ prognosis undergoing resection with those receiving non-surgical treatment. Moreover, we set out to identify and confirm important prognostic factors after resection of CRLM.

**Patients and Methods:** We analyzed the outcome of 506 patients diagnosed with CRLM in our institution from 1996 to 2011. Survival and impact of clinical and pathological factors were analyzed by univariate analysis. Important independent prognostic factors were analyzed by multivariate analysis.

**Results:** The 5-year overall survival rate (5 y-OSR) for patients receiving resection of CRLM (n = 152) was 46% (95% CI: 37–54%) compared to a 5 y-OSR of 6% (95% CI: 4–9%) for patients treated non-surgically (n = 354). There was no perioperative mortality. Multivariate analysis revealed, amongst others, good performance status of the patient (low ASA score), the absence of extrahepatic metastases, <5 metastatic lesions and tumor free resection margin (R0) as important, independent prognostic factors. Importantly, repeated hepatic resections of CRLM performed in 13 patients was associated with an excellent outcome (5 y-OSR 47%; 95% CI: 17–72%).

**Conclusion:** Surgical resection is the first choice for patients diagnosed with metachronous and synchronous CRLM which can be performed with tolerable site-effects. Of note, repeated resections should be advised in recurrent intrahepatic CRC whenever possible.

**Keywords:** Colorectal cancer, Surgery, Liver metastases, Resection, Survival.

OP14-5
Complications after Extended Colo-Rectal and Exenterative Pelvic Surgery
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**Aims:** We assess: Complications after extended colorectal abdominal and pelvic surgery. Measures to avoid complications. Management of complications. Survival.

**Methods:** Retrospective analysis of 266 patients with advanced abdominal colorectal or pelvic malignancies, comparing two periods 2004–2009 and 2010–2014. For 181 advanced primary or resection rectal, urological and genital carcinomas we performed pelvic exenterations (PE) – 57 total, 69 posterior, 47 anterior; 8 meso-exenterations; 8 ileocolic exenterations (pelvic cavity infection 5%; discharge about 65 days, leakage of ileostomy 4%; ureteral stricture 10%; Gastrointestinal 18% (ileus 1%, radiation colitis 1%, stercoral fistula 10%, rectal anastomosis leakage 4%); Pelvic floor – 44% (pyelonephritis 30%, pyonephrosis 1%; hydronephrosis 3%, necrosis of distal ureter forming urostomy 4%; ureteral stricture 10%); Gastrointestinal 18% (ileus 1%, radiation colitis 1%, stercoral fistula 10%, rectal anastomosis leakage 4%); Pelvic floor – 44% (pelvic cavity infection 5%; discharge about 65 days, leakage of implanted pelvic mesh 2%). After EUAS: subdiaphragmatic liquid collection 23 patients; prolonged discharge 15; needing additional percutaneous drenagage 8.

**Results:** Complications: After PE – early and late: Urinary – 48% (pyelonephritis 30%, pyonephrosis 1%; hydronephrosis 3%, necrosis of distal ureter forming urostomy 4%; ureteral stricture 10%); Gastrointestinal 18% (ileus 1%, radiation colitis 1%, stercoral fistula 10%, rectal anastomosis leakage 4%); Pelvic floor – 44% (pelvic cavity infection 5%; discharge about 65 days, leakage of implanted pelvic mesh 2%). After EUAS: subdiaphragmatic liquid collection 23 patients; prolonged discharge 15; needing additional percutaneous drenagage 8.

**Assessing tumor – origin, localization, histopathology, spread, surgery. Postoperative mortality 6%. Conservative treatment resolves 80% of complications. Operative: percutaneous nephrostomy 3%, ureterostomy reinsertion 4%, nephrectomy 1%, colostomy correction 1%, bowel suture 1% or resection 2%, transverso-
tomy 4%, re-repair of pelvic floor 2%. Survival: Radical PE: 12 months: 59; 18 months: 41; 2 years: 39; 5 years: 27 patients. Palliative PE: 18 months. Palliations: 6 months. In second period complications decreased; 5-years survival increased from 16.5% to 22%.

Conclusions: Despite extended and exenterative surgery has high morbidity, it increases survival, being only radical treatment of extended tumors. Complications are factor determining survival. Knowing complications contributes to avoid them.

### OP14-6

**Laparoscopic Surgery for Rectal Tumors in Terms of Modified Neoadjuvant Treatment**

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**Background:** The study presents our experience of advanced rectal tumors after modified neoadjuvant therapy.

**Method:** Between 01.01.2015 and 01.01.2016, 100 patients were admitted of rectal tumors. Staging protocol (endoscopy, biopsy, CT/MRI, endosonography) was performed in all cases. In the laparoscopic group 25 patients received modified neoadjuvant treatment (22 cases: radio-chemotherapy, 3 cases: chemotherapy). The ratio of open/laparoscopic surgery was 38/62. Among the laparoscopic group, curative procedures were performed in 52 cases (resection: 25, exirpation: 14, resection with protective ileostomy: 10, Hartmann procedure: 2, combined: 1).

**Results:** Among the neoadjuvant received therapy and later on underwent laparoscopic surgery, rectal resection with protective ileostomy was performed in 8 cases, resection on its own in 5 cases and extirpation in 10 cases. In terms of surgical morbidity, we found no significant difference between the two laparoscopic groups (with, or without neoadjuvant treatment). Operative time, intraoperative bloodloss, perioperative blood transfusions (8–8 units/group) were equal. Days of hospital stay were nearly the same (neoadjuvant [NA]: 7 days vs. non-neoadjuvant [non-NA]: 7.5 days), elapsed days until first bowel movement was 2.4 days among the NA-, and 3.3 days among non-NA group. Although, the number of removed lymphnodes was as follows: NA vs. n-NA: 10 vs. 13, the number of tumor involved lymphnodes were twice as much in cases of non-NA group (NA vs. non-NA: 1.2 vs. 2.4). Mean distance from the distal resection margin was as follows: NA vs. non-NA: 3 vs. 2.4 cm. Tumor regression grade (TRG) was as follows: TRG 1:5, TRG 2:4, TRG 3:12, TRG 4:3, TRG 5:1. Mortality did not occur.

**Conclusion:** Currently, neoadjuvant treatment classifies as standard therapeutic algorithm, in cases of advanced stage rectal tumors. The results of laparoscopic procedures performed after neoadjuvant treatment do not differ significantly from the ones operated on primarily at an early stage.

**Keywords:** Rectal cancer, Modified neoadjuvant therapy, Laparoscopic surgery.

### OP14-7

**Histopathologic Risk Factors for Lymph Node Metastasis in T1 Colorectal Cancer**

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**Background/Aims:** Evaluating the risk of lymph node metastasis is critical for determining the suitability of additional surgery after endoscopic resection of T1 colorectal cancer. Our previous research reported that grade3, budding, angiolymphatic invasion, and the absence of background adenoma are associated with node metastasis in T1 colorectal cancer. In this study, we analyzed our updated data to identify histopathologic risk factors of node metastasis in T1 colorectal cancer.

**Method:** This study involved 774 patients with T1 colorectal cancer treated by endoscopic (n = 126) or surgical (n = 648) resection between January 2001 and December 2015 at the National Cancer Center, Korea. Details regarding depth of submucosal invasion, histologic grade, budding, angiolymphatic invasion, venous invasion, perineural invasion, and background adenoma were evaluated with respect to the status of node metastasis. In endoscopically resected cases, of which node metastasis cannot be directly evaluated, the status of node metastasis was indirectly evaluated according to clinicopathologic results of follow-up studies or salvage surgeries.

**Result:** In surgically resected cases, node metastasis was detected in 90 patients (13.9%). In endoscopically resected cases, 8 patients (6.3%) were evaluated as the positive status of node metastasis because salvage surgery showed node metastasis, or was not performed due to multiple metastasis. Thus, total 98 patients (12.7%) were in the positive status of node metastasis. Deep submucosal invasion, histologic high grade, budding, angiolymphatic invasion, and venous invasion were significant in both univariate and multivariate analyses (p < 0.05). Perineural invasion was significant only in univariate analyses.

**Conclusion:** Deep submucosal invasion, histologic high grade, budding, and vascular invasion are the risk factors that predict lymph node metastasis in T1 colorectal cancer. If any risk factors are detected after endoscopic resection of T1 colorectal cancer, additional surgery should be considered.

**Keywords:** Colorectal neoplasm, Lymphatic metastasis.
**OP14-8**

The Early Outcome of Lateral Lymph Node Dissection Using 3-Dimensional Laparoscope

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**Introduction:** The 3-dimensional (3-D) laparoscope has advantage of depth perception over conventional 2-dimensional (2-D) laparoscope. The aim of this study was to clarify the feasibility and efficacy of lateral lymph node dissection (LLND) for rectal cancer using 3-D laparoscope.

**Methods:** Between November 2015 and April 2016, 7 consecutive patients underwent 3-D laparoscopic lateral lymph node dissection for rectal cancer at Seoul National University Hospital. Short-term outcomes were evaluated.

**Results:** Median patients age was 63 years (range 42–81). Low anterior resection was performed in 6 patients and abdominopereineal resection in 1 patient. Unilateral LLND was done in 5 patients and bilateral LLND in 2 patient. Median operation time was 297.5 min (range 225–390), and the median time required for LLND was 66 min (range 40–96). There was no case of conversion to open surgery. Median blood loss was 150 ml (range 50–200). Median number of harvested lateral LN were 8 (range 3–28) at each side. Among 7 patients, lateral lymph node was positive in 4 patients. The median duration of postoperative hospital stay was 7 days (range 5–8). There was no postoperative mortality and morbidity.

**Conclusion:** 3D-laparoscopic surgery appears to be a feasible and safe option in lateral lymph node dissection in rectal cancer patients.

**Keywords:** Lateral lymph node, 3-D laparoscope, Rectal cancer.

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**OP14-9**

Randomized, Multicenter Study of the Role of Primary Tumor Resection in Colorectal Cancer Patients with Asymptomatic, Synchronous Unresectable Metastasis

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**Background/Aims:** It is still controversial whether chemotherapy with or without primary tumor resection (PTR) is effective in treating colorectal cancer patients with unresectable metastasis. The aim of this study is to analyze the survival rates and to evaluate the role of PTR in asymptomatic stage IV colorectal cancer patients with synchronous unresectable metastases.

**Method:** Patients who were diagnosed with colorectal cancer with asymptomatic, concomitant unresectable metastases were evaluated between October 2013 and May 2015 from 11 institutes in Korea. Among them, a total of 45 patients were enrolled in this study and randomly assigned as either the PTR group (n=24) or the upfront chemotherapy group (n=21). Median follow-up period was 14 months (interquartile range, 9.0–22.0). The primary endpoint was to measure 2-year overall survival. The secondary endpoint was to compare the complication rates between the two groups.

**Result:** The 2-year overall survival rate of the PTR group was higher than the upfront chemotherapy group (71.7% vs. 43.8%, p = 0.043). In addition, cancer-specific survival in the PTR group was 74.9%, which was 46.4% higher than the upfront chemotherapy group (p = 0.034). There were 6 patients (28.6%) in the upfront chemotherapy group who underwent resectable conversion of the metastatic site. Patients in the PTR group stayed in the hospital during 15.5 ± 7.9 days (range, 7–36) and received first postoperative chemotherapy within 24.5 ± 12.4 days after surgery. The rate of complication was not significantly different between the two groups. However, the PTR group had just 20.8% complications and the upfront chemotherapy group had 42.9% complications.

**Conclusion:** PTR with chemotherapy showed better oncologic outcomes than upfront chemotherapy in patients with stage IV colorectal cancer with asymptomatic, synchronous unresectable metastasis. The complications after PTR were comparable with...
upfront chemotherapy. These findings can imply the importance of PTR to improve survival rate in stage IV colorectal cancer.

**Keywords:** Stage IV, Colorectal Cancer, Unresectable, Metastatic, Primary tumor resection.

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**OP15-1**  
**Robotic Assisted Surgery for Benign Hepatobiliary Diseases**  
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**Background:** Recently robotic surgery has emerged as one of the most promising surgical advances. Despite its worldwide acceptance in many different surgical specialties, the use of robotic assistance in the field of hepatobiliary (HBP) surgery remains relatively unexplored.

Our study presents single institution’s initial experience of robotic assisted surgery for treatment of benign hepatobiliary pathologies.

**Methods:** A retrospective analysis of a prospectively maintained database on clinical outcomes was performed for 26 consecutive patients that underwent robotic assisted surgery for benign HBP disease at Rambam Medical Center during 2013–2015.

**Results:** There were 26 robotic assisted surgical procedures performed for benign HBP pathologies during the study period. There were 3 anatomical robotic liver resections for symptomatic hemangiomas, 9 cases of giant liver cyst, 5 robotic assisted surgery for type I choledochal cyst, 2 case of benign (iatrogenic) common bile duct (CBD) stricture, 3 cases of robotic (CBD) exploration due to large intra choledochal stones and 6 cases of cholecystectomy for cholelithiasis. The median postoperative hospital stays for all procedures were 3.5 days (range 1–6 days). General morbidity (minor) was 2%. There was no mortality in our series.

**Conclusion:** Robotic surgery is feasible and can be safely performed in patients with different benign HBP pathologies. Further evaluation with clinical trials is required to validate it’s real benefits.

**Keywords:** Robotic, Hepatobiliary, Surgery.

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**OP15-2**  
**Comparison of Open versus Laparoscopic Operation for T2 Gallbladder Cancer**  
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**Background/Aims:** The objective of this study is to determine the feasibility of laparoscopic operation for T2 gallbladder cancer (GBC).

**Method:** Of 188 GBC patients who underwent an operation at our hospital between Oct 2003 and Jun 2014, 100 patients whose T stage was diagnosed with T2 were retrospectively reviewed. Patients were divided into 2 groups, open surgery group (OS group) and laparoscopic surgery group (LS group). Electronic medical recordings (EMR) were reviewed to check clinicopathological characteristics and disease free survival (DFR) of patients. Each patient’s overall survival (OS) was confirmed by mortality record or by telephone survey performed on Oct 2nd, 2014.

**Result:** Eighteen patients who had another malignancy or distant metastasis or who were lost to follow up were excluded. There were 49 patients in OS group and 33 patients in LS group. Based on the Clavien-Dindo classification, there were 3 grade I, 1 grade II, and 2 grade IIIa postoperative complications in OS group (12.5%, 6/48), and 1 grade I and 3 grade IIIa complications in LS group (12.1%, 4/33). Complication rates were not significantly different (p = 0.959). Average postoperative hospital stay was significantly longer in OS group (11.0 days) than in LS group (5.9 days) (p = 0.001). There was no significant difference in 5-year DFR between OS group and LS group (57.1% vs. 71.9%, p = 0.086). There was no significant difference in 5-year OS between OS group and LS group (79.5% vs. 81.6%, p = 0.862).

**Conclusion:** Laparoscopic approach including regional lymph node dissection for treatment of T2 GBC was comparative to open approach in terms of DFR, OS and complication rate. Further prospective study with higher number of patients should be done to confirm this result in the future.

**Keywords:** Gallbladder cancer, T2 gallbladder cancer, Laparoscopic cholecystectomy.
Methods to Decrease Post Operative Pancreatic Fistula: Our Initial Experience with Addition of Braun’s Anastomosis

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Introduction: Different techniques and modifications have been described to bring down the incidence of pancreatic fistula rate. However, no techniques have been accepted as a gold standard. Since 2014, we started adding Braun’s anastomosis in all patients undergoing pancreaticoduodenectomy. Here, we intend to present our initial experience in pancreatic fistula rate after addition of Braun’s anastomosis.

Methods: Prospectively maintained medical records of the patients (operated between Feb. 2014 till May 2016) undergoing pancreaticoduodenectomy with addition of Braun’s anastomosis at the end of other reconstruction were studied. Pancreaticoenteric reconstruction was done by continuous dunking method. Postoperative complications mainly, incidence of post pancreatectomy fistula (POPF), hemorrhage (PPH) and delayed gastric emptying (DGE) along with other major complications were analyzed. ISGPS definition was used to define the major, surgery specific complications of pancreatectoduodenectomy.

Results: Total 24 patients underwent the defined procedure. Male to female ratio was 9:15. Total 3 (12.5%) patients had preoperative drainage while 4 (16.6%) patients had history of cholangitis. Mean albumin level was 3.7 ± 0.44 gm/dl and preoperative hemoglobin was 11.17 ± 1.27 gm/%. Total 8 (33.3%) patients had soft pancreas. Overall fistula rate was 20% (5/24) while clinically significant DGE rate was 0%, PPH was seen in 8.3% (2/24) and soft pancreas. Overall fistula rate was 20% (5/24) while clinically significant DGE (overall DGE 12.5%, 3/24). There was one perioperative mortality (4.1%) due to afferent limb volvulus.

Conclusion: Addition of Braun’s anastomosis could be a promising modification to bring down the POPF rate to a minimum. Properly designed randomized trial is necessary to prove the effect of addition of Braun’s anastomosis with POPF.

Keywords: Pancreatectoduodenectomy, Pancreatic fistula, Braun’s anastomosis.

Prognostic Heterogeneity of Current UICC Stage III Gallbladder Carcinoma after Curative Intent Resection

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Background: The International Union against Cancer (UICC) Stage III classification of gallbladder carcinoma contains a heterogeneous group of patients with early local disease with regional lymph node metastasis (T1/N2/M0) and advanced local disease with or without regional lymph node metastasis (T3N0/M0). This study aimed to evaluate the prognostic heterogeneity of the Stage III classification of gallbladder carcinoma.

Methods: A total of 175 patients with gallbladder carcinoma who underwent radical resection were enrolled. Of these patients, 22 were classified as Stage IIIA (T3N0/M0) and 46 as Stage IIIB (T2N1M0 [n = 23] and T3N1M0 [n = 23]); none of the patients with T1 tumor had nodal disease in this study.

Results: This staging system failed to stratify outcomes between Stages IIIA and IIIB; survival was better for patients with Stage IIIB than for patients with Stage IIIA, with 5-year survival rates of 54.9% and 41.0%, respectively (P = 0.366). Multivariate analysis revealed better outcomes for patients with T2N1M0 disease than for patients with T3N0M0 disease (P = 0.016) and
T3N1M0 disease (P = 0.001) with 5-year survival rates of 77.0%, 41.0%, and 31.0%, respectively. When N1 status were subdivided according to the number of positive nodes, the 5-year survival rates in patients with T2 tumor with 1–2 positive nodes, T2 tumor with ≥3 positive nodes, T3 tumor with 1–2 positive nodes, and T3 tumor with ≥3 positive nodes were 83.3%, 50.0%, 45.8%, and 0%, respectively (P < 0.001).

Conclusions: The prognosis of T2N1M0 disease is better than that of the other Stage III groups, suggesting that all node-positive patients do not have uniformly poor outcomes after resection in resectable gallbladder carcinoma. T2 tumor with 1–2 positive nodes leads to a favorable outcome after resection, whereas T3 tumor with ≥3 positive nodes indicates a dismal prognosis.

Keywords: Gallbladder carcinoma, Lymph node metastasis, Prognosis.

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OP15-6

Vascular Reconstruction(SM/PV) in Periampullary Tumors: Is There a Difference?

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Vascular Reconstruction in periampullary tumors is there a difference? Surgical resection remains the treatment of choice and only hope for long-term survival for patients with pancreatic cancer. Numerous studies have supported the safety and feasibility of combining PD with vascular resection in an attempt to obtain negative margins.

Aim: To evaluate the impact of vascular reconstruction on the early postoperative outcome after resection of periampullary tumors.

Methods: From January 2010 to October 2015, 114 patients underwent PD for periampullary tumors in National Liver Institute, Monufia University. Patients who underwent PD with vascular resection (N = 18) were compared to patients who underwent standard PD (N = 96) as regard: Vascular reconstructions were performed due to: vascular invasion in 14 patients and vascular injury in another 4 patients. Vascular reconstructions were performed with resection of the involved vascular segment with: primary repair (N = 12), vein patch (N = 4), & interposition grafting in 2 patients.

Results: Male 11 (61.1%) and female 7 (38.9%) age range (39–72) with the mean 56 pancreatic duct stent in three patients (16.75), operative time range (4–8 h) with mean ± SD 6.1 ± 1.6, blood loss range (350–1300) with mean ± SD 581.25 ± 308.1, and blood transfusion occurred in four patients (22.2%) LN involvement in 10 (55.6%), vascular invasion in 7 (38.8%) and surgical margin free in 15 (83.4%). There is no statistically significant difference between the postoperative 6 month’s survival in patients with vascular reconstruction and those without vascular reconstruction (P value = 0.098).

Conclusion: Perioperative mortality, readmission rates, length of stay, and overall complication rates does not significantly differ between standard PD and PD with VR.

Keywords: Pancreatic cancer, Vascular invasion.

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OP15-7

Hepatic Arterial Resection without Reconstruction for Locally Advanced Pancreatic Cancer with Hepatic Arterial Invasion

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Background: Surgical resection is the only hope for cure in patients with pancreatic cancer. The locally advanced pancreatic cancer with arterial invasion is usually considered as contra-indication of surgical resection, due to high morbidity and mortality of arterial resection, especially due to the obstruction of reconstructed artery.

Aim: To assess the effectiveness of combined arterial resection without reconstruction following preoperative arterial embolization for locally advanced pancreatic cancer with arterial invasion.

Methods: We analyzed 13 cases of pancreatic resection with combined hepatic arterial resection for pancreatic cancer invading hepatic artery in Chiba University Hospital between 2007 and 2015. In all cases, no arterial reconstruction was performed.

Results: Median age was 67 (40–74) years old and M:F was 7:6. Ten cases were primary pancreatic ductal cancer and 3 cases were remnant pancreatic cancer. In all cases, preoperative coiling of PHA and/or CHA was performed and collateral hepatic arterial flow was confirmed by contrast-enhanced CT. Combined portal vein resection and reconstruction was performed in 9 cases. Median operative time was 510 min and median blood loss was 2160 ml. Post-operative serum AST/ALT level was elevated to 1273/967 IU/L (average) at day 1 but rapidly decreased to 99/75 IU/L at day 7. Post-operative liver abscess was found in 1 case and percutaneous drainage was performed. Post-operative complication (≥Clavien-Dindo class III) was found in 7 cases (53.8%). No perioperative mortality was observed. R0 resection was achieved in 7 cases (53.8%). The median overall survival and 5 year survival rate of patients who underwent R0 resection was 23 months and 26.8%.

Conclusion: Pancreatic resection combined with hepatic arterial resection without reconstruction following preoperative coil embolization can be performed safely. This method also achieved high R0 rate. The more precise indication of this procedure should be assessed to achieve R0 resection.

Keywords: Pancreatic cancer, Arterial resection, Remnant pancreatic cancer.

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Abstracts
OP15-8
The Role of Vascular Resections in Surgical Treatment of Pancreatic Cancer
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Pancreatic cancer (PDAC) is one of the leading causes for cancer-related mortality world-wide and, even in 2016, still a therapeutic challenge. As pancreatic surgery has significantly changed during the past years, resection approaches have been extended beyond standard procedures, including vascular resections, that have become more frequently performed in specialized centres and the border of resectability has been pushed forward to achieve a potentially curative approach in the respective patients in combination with neoadjuvant and adjuvant treatment strategies. This study aims to evaluate the effect of radical vascular resections.

We have performed a retrospective study comparing patients with radical pancreatic surgery with (PVR) and without (PR) vascular resections. In the study were included 356 patients with pancreatic cancer radically operated in our department for a 10 years period (2006–2016)-285 pancreatoduodenectomies and 71 distal pancreatectomies.

Seventy two of the presented patients underwent pancreatic resection with simultaneous vascular resection-SMPV in 65 cases (44 with resection of the portal vein, 15 with resection of the superior mesenteric vein, 6 with resection of the porto-mesenterial confluence), arterial in 2 and partial resections of IVC in 5 cases. Combined vascular resections were done in 3 cases. Twenty-eight segmental (21 end-to-end anastomosis and 7 interposition grafts) and 37 partial wedge venous resections of SMPV were done. Both groups PVR and PR showed similarly close results in complication rates, mortality and morbidity. Three and 5-years survival rates was 42% and 38% in PD group and 28% and 19% in PVR group.

Radical surgery ensures better long-term results. Standardizing of the preoperative staging and the surgical approach and technique are the most important details of the complex treatment of pancreatic cancer. We recommend this type of surgery to be concentrated in highly specialized centers in order to improve the outcome.

Keywords: Pancreatic cancer, Venous resection, Radical surgery.

OP15-9
Appropriate Dissection Based on the Anatomical Feature of the Mesopancreas in the Pancreatic Head Cancer
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In the pancreatic head cancer, hemicircumferential superior mesenteric artery plexus resection has been adopted. Whereas, extended resection can affect the adjuvant chemotherapy. We describe our procedure of appropriate dissection of the mesopancreas, based on the way of cancer progression and anatomical feature of the mesopancreas revealed by multi-detector raw CT (MDCT) and autopsy. MDCT findings: In 42 cases of resected pancreatic head cancer, 73.8% cases are positive for extrapancreatic nerve plexus invasion in preoperative MDCT. And 54.8% of these cases are positive for cancer invasion in $\leq 3$ mm from SMA margin pathologically. In almost all of them, extent of cancer around the SMA is right oblique posterior range. Therefore we preserve the SMA plexus for the cases who are negative for the mesopancreas invasion in preoperative MDCT, and dissect the right oblique posterior range of SMA plexus for the cases who are positive for the mesopancreas invasion in preoperative MDCT. Autopsy findings: we examined the anatomical feature of the mesopancreas from the point of view of the distribution of nerve fibers. Left side of near the root of the SMA, there was loose area in which there were not any nerve fibers. We consider this loos area is left cranial border of the mesopancreas. Right side of near the root of the SMA, there was also loose area between nerve fibers distributed to the uncinate process and the cranial dorsal site of the pancreatic head. Whereas, there was no border between the nerves distributed to the uncinate process and the jejunum. To achieve en bloc resection of the mesopancreas including the nerve fibers to the uncinate process, it is very important to understand and expose these landmarks. Appropriate dissection of the mesopancreas needs further understanding of distribution of the nerve fibers around the SMA.

Keywords: Pancreas, Mesopancreas.
Feasibility of F-18 FDG PET/CT-Guided Cytoreductive Surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) in Patients with Peritoneal Carcinomatosis: A Preliminary Experience

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**Background:** The prognosis of patients with secondary peritoneal carcinomatosis (PC) remains poor, despite of the variable best standard treatment options. Recently, cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) has been developed to treat PC. But exact pre-surgical determination of localization and extent of PC is crucial for the clinical outcome due to the reported considerable complications. This study aims to review our preliminary experience with F-18 FDG PET/CT-guided CRS and HIPEC in patients with PC.

**Method:** 7 patients (3 men and 4 women; mean age 62.3 years; range 60–72) with secondary PC from April 2015 to March 2016 were enrolled in this study. All patients had been examined on pre-operative staging F-18 FDG PET/CT. Images were assessed and analysed as positive or negative, regarding presence and localization of PC manifestations based on the peritoneal cancer index (PCI) by Sugarbaker et al. Patients underwent CRS and HIPEC within 10 days afterward. PET/CT images were assessed and correlated with surgical reports and pathologic confirmation. Post-surgical PET/CT exams were performed on one-month later for assessment of the residual tumor burden in three patients.

**Result:** Total 79 peritoneal segments in 7 patients were sampled during CRS HIPEC (PET positive segment n = 62, PET negative segment n = 17). PET/CT provided a reliable detection of PC. Diagnostic performance of F-18 FDG PET/CT-guided CRS HIPEC in patients with PC was sensitivity 92%, specificity 94%, PPV 98%, NPV 77%, and diagnostic accuracy 92% with lesion-by-lesion analysis. Moreover, we could be notified a dramatically decreased metabolic tumor burden of PC after CRS HIPEC with comparison of pre- and post-surgical FDG PET/CT in three patients who underwent post-surgical PET/CT examination.

**Conclusion:** PET/CT-guided CRS HIPEC appears to be technically feasible and effective in patients with excessive peritoneal metasteses.

**Keywords:** PET, CT, PET-guided surgery, CRS HIPEC, Peritoneal carcinomatosis, Peritoneal seeding.

MiR-146a Induces the Cancer Stem Cell and EMT Phenotype in Oral Squamous Cell Carcinoma by Regulating CD24-β-Catenin Axis

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**Background:** Cancer stem cells emerges as one of the most vital tumor initiation and maintenance system in almost all types of malignancies. Implicit is the role of CD44 in defining CSCs but the importance of CD24 in Oral Squamous Cell Carcinoma is not well-explored. Characterization of CSC population in OSCC is therefore, a pre-requisite to the downstream study into its epigenetic regulation. De-regulation of microRNAs are known to be implicated in tumor prognosis but whether it regulates stemness in OSCC remains unclear.

**Method:** We have used various stem cell assays, RT-PCR and Western blot to identify the CSC population. Migration, Invasion and EMT was also measured followed by cell cycle and viability assays. We have delineated the underlying signaling pathways of stemness induction.

**Result:** We show that CD44highCD24low cells isolated from the OSCC expresses stem cell related genes along with Epithelial-to-Mesenchymal transition characteristics. Typical CSC phenotypes were observed in these slow-cycling cells in addition to increased chemo-resistance. miR-146a was significantly up-regulated in CSCs which caused enhanced expression of CSC markers and potentiated formation of spheroids. Interestingly, miR-146a induces CSC traits by stabilising β-catenin/Wnt signaling with loss of CD24 marker. Over-expression of CD24 gave rise to rescue of miR-146a induced CSC phenotypes suggesting a possible interaction between CD24 and miR-146a regulating β-catenin/Wnt/Akt signaling pathway. AKT inhibition is actually conferred by CD24 that subsequently leads to β-catenin degradation. In agreement to the previous findings, we confirmed a positive feedback loop in β-catenin mediated transactivation of miR-146a that possibly contributes to stem cell maintenance.

**Conclusion:** Taken together, these results provide a proof-of-principle that miR-146a plays a key role in sustaining CD44high CD24low status in Oral Squamous Cell Carcinoma.

**Keywords:** CD44, CD24, OSCC, CSC.
OP16-3
Accuracy of POSSUM in Predicting Postoperative Complications of Abdominal Surgery for Patients with Malignant Diseases: A Multi-Institutional Analysis in Local Databank

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Background: To improve survivals of the patients of malignant disease (MD), the prediction of postoperative complications (PCs) is essential for subsequent adjuvant therapy. POSSUM (Physiological and Operative Severity Score for enUmeration of Mortality and Mortality) is a formula, originated in 1991 in the United Kingdom, utilized for prediction of PCs and is composed of physiological (P-) and operative (O-) score. The demand of precise PCs prediction in MD patients is increasing in Japan, as society aged.

Purpose: The aim of this study was to verify the accuracy of POSSUM in predicting PCs of abdominal surgery for patients with MD.

Patients and Methods: A total of 1348 patients except those with esophageal cancer were enrolled in the local databank of gastrointestinal surgery in Shimane, Japan. The data was collected from 3 hospitals between April 2007 and December 2010. Among them, 782 patients received various abdominal operations for MD. The predicted PCs were compared between the patients with MD and benign diseases (BD; n = 566), using receiver operating characteristic curve (ROC) analysis. The predictive accuracy of POSSUM was evaluated by Wilcoxon signed-rank test.

Results: POSSUM discriminated the patients who would suffer PC after operations for both MD (presence of PC: 59.9% vs. absence of PC: 43.8%, p < 0.001) and BD (presence of PC: 54.7% vs. absence of PC: 22.1%, p < 0.001). The area under the curve (AUC) of ROC in MD patients was lower than that in BD patients (0.607 vs. 0.739). Especially, AUC of P-score in MD patients was lower than that in BD patients (0.560 vs. 0.717).

Conclusion: POSSUM was useful for predicting PCs in both MD and BD patients. However, the predicting accuracy in the abdominal surgery for MD patients was inferior to in BD patients. Re-evaluation of P-score for MD patients might be necessary to improve the predictive accuracy of POSSUM.

Keywords: POSSUM, Malignant disease.

OP16-4
Outcomes of Treatment of Metastatic Gastrointestinal Tumor (GIST) in Imatinib Era: Do We Really Need Kit Mutation Analysis?

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Introduction: The survival of GIST patients have improved significantly with imatinib (IM), in the metastatic setting.

Methods: The data of 132 consecutive patients of advanced/metastatic GIST treated at our centre from October 2004 to April 2016, was analyzed (Median follow up 2.4 years).

Results: Of 132 patients, 78.8% were males with a median age of 54 yrs (range 21 to 80 yrs). C kit mutation profile was available in 77 patients (58.3%), with exon 11 positive in 36 (47%), exon 9 positive in 8 (10%), wild type in 12 (15%), exon 13 mutation in 1 patient, uninterpretable in 11 (14%). PDGFRA mutation analysis was available in 10 patients, (wild type in 6, exon 12 in 3, exon 18 in 1). Complete response (CR) was seen in 2.2%, partial response (PR) in 46.2%, stable disease (SD) in 30.3% and progressive disease (PD) in 9 (6.8%). The median PFS was 3.1 years with a 8 yr PFS of 24%. The 8 yr OS was 53.7% with the median OS being 8.2 years. Those who had CR/PR, had significantly better OS (p = 0.005) as compared to those who achieved SD. The achievement of ORR as compared to SD in patients with non-exon 11 mutations was associated with a statistically significant overall survival advantage (Median OS-CR/PR vs. SD - not reached vs. 2.3 yr; p value –0.003) but it was not true for patients with exon 11 mutations.

Conclusion: Our study confirms the long overall survival of advanced GIST treated with Imatinib. Non exon 11 mutants with responses performed better than those with stable disease, potentially identifying these patients as having longer OS. Non exon 11 mutants with disease stabilization were identified as a cohort who may require alternative treatment strategies to improve long term outcomes.

OP16-5
Sarcopenia Predicts Morbidity and Mortality Following Abdominal Surgery: A Systematic Review and Meta-Analysis

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Background: Despite significant improvements in outcomes following abdominal surgery, predicting those who are at risk remains challenging. Pre-operative cross-sectional imaging can be used to estimate lean muscle mass, and its predictive value has been widely reported over recent years. We performed a systematic review in order to address the following question: Does sarcopenia predict outcomes following abdominal surgery?

Methods: Medline, Embase, Scopus, Current Contents, Cochrane Library, and Clinicaltrials.gov between 1970 and 2015 were performed. Search terms (39) fell under the following headings:
imaging, surgery, outcomes. The PRISMA reporting guidelines were followed. Statistical analyses were carried out in RevmanTM.

**Results:** 8272 articles were identified, following exclusion 26 included in the final review comprising 5665 patients. The primary pathology included liver (9), pancreas (5), colorectal (4), transplantation (2), renal (2), oesophago-gastric (2), biliary (1) and bladder (1) with 24 (92%) of studies including patients with malignant pathology. All studies used radiological software programmes, using Hounsfield Units and normalising for height. The majority of reports used locally derived sex-specific thresholds for defining sarcopenia based on the morphology of the resident populations. The overall prevalence of sarcopenia was 59%, ranging from 15% (colorectal) to 73% (liver metastases). Sarcopenia predicted major complications (Clavien-Dindo >3 OR 1.59 CI 1.11 2.27 p = 0.01 n = 2520), 30 day mortality (OR 2.28 CI 1.06 4.91 p = 0.04 n = 1956), 1 year survival (OR 1.30 CI 1.12–1.52 p = 0.008 n = 502) and 5 year survival (OR 1.12 CI 1.05–1.20 p = 0.004 n = 861). Length of stay was generally increased across studies (14.02 vs. 11.49 sarcopenia vs. non-sarcopenia).

**Conclusions:** Cross sectional imaging provides an effective method of characterising body morphometrics in patients undergoing abdominal surgery. In isolation, a low lean muscle mass independently predicts outcomes following surgery. These results make a strong case for prospective trials aimed at reversing sarcopenia prior to surgery with the aim of improving outcomes.

**Keywords:** Sarcopenia, Prediction, Muscle mass, Surgery.

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**OP16-6**

**Current Scenario in Abdominal Tuberculosis and Its Surgical Management**

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**Background/Aim:** In the recent times resurgence of tuberculosis has emerged as a major health concern in underdeveloped countries due to larger incidence of unmanageable HIV disease, and also in many developed countries due to the unchecked immigrants from tubercular endemic areas. Abdominal tuberculosis can occur anywhere in the gastrointestinal tract, peritoneum, mesentry, its nodes, spleen and hepatopancreatobiliary system. The wide spectrum of presentation makes abdominal tuberculosis a difficult disease to diagnose and can pose a diagnostic and therapeutic challenge for physicians as well as surgeons to manage it. This paper intends to describe and review the spectrum of clinical presentation of abdominal tuberculosis and its management.

**Method:** Data was collected over the period of last 5 years on all the admitted patients with established diagnosis of abdominal tuberculosis. Data was segregated by various parameters of age, sex, presenting complaints, time of presentation and type of management.

**Result:** Total number of 262 patients were reviewed in a period of 5 years in which 179 (68.32%) were female and 83 (31.67%) were male and majority of the patients were of younger age group. Most common presenting complaint was abdominal pain in 98.4% of patients followed by vomiting (69.85%), distension of abdomen, fever, weight loss and abdominal lump. Out of 262 patients 228 (87.02%) patients underwent surgical exploration. Various surgical procedure which was carried out were resection & anastomosis (36.40%), Right hemicolectomy (17.54%), Stricuroplasty (15.35%), Ileostomy (13.15%), Adhesiolyis (8.77%), band release (4.82%), closure of perforation (3.50%) and splenectomy (0.43%).

**Conclusion:** Abdominal tuberculosis is a common extra-pulmonary manifestation of tuberculosis. Though abdominal tuberculosis has wide spectra of clinical presentation and may mimic chronic abdominal condition, a high index of suspicion should be kept in mind for diagnosis in cases of acute/chronic abdomen, intestinal obstruction/perforation and peritonitis. Surgical exploration should be mainstay not only for its management but also for histopathological diagnosis. Being a systemic disease, anti-tuberculous therapy also remains the main stay of treatment before and after the surgery.

**Keywords:** Abdominal tuberculosis, Intestinal tuberculosis, Abdominal pain, Stricture, Ileostomy.

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**OP16-7**

**Risk Assessment for Gastrointestinal Cancers in Patients with Family History of Gastrointestinal Cancer: Multi-Center Interim Analysis Study in the Republic of Korea**

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**Background:** A number of personal and environmental risk factors are known to gastrointestinal (GI) cancer. We wonder whether family history of GI cancers in first relatives has relevance to an increased risk of any GI cancer or not. The aim of this study was to evaluate the relationship between family history of GI cancers and incidence of any GI cancer in Korean populations.

**Patients and Methods:** From 2015 to 2016, 623 GI cancer patients and 591 controls in 11 hospitals in the republic of Korea were included in the analysis. Personal medical histories, life styles, and family history of GI cancers were collected with a self-administered questionnaire. A logistic regression model was evaluated to estimate the risk of developing any GI cancer.
Results: There was a significantly increased incidence of GI cancers in patients with family history of GI cancers than in controls (p = 0.036). And patients with family history of GI cancer tended to diagnose GI cancer at earlier age (p = 0.016). Multivariate analysis showed age (OR 1.069, 95% CI 1.056–1.081), male gender (OR 0.476, 95% CI 0.328–0.690), BMI (OR 0.937, 95% CI 0.899–0.977), smoking (OR 1.344, 95% CI 1.098–1.647), meat rich diet (OR 0.604, 95% CI 0.457–0.799) and sibling’s history of GI cancer (OR 2.058, 95% CI 1.209–3.502) were independent risk factors for GI cancers. In subgroup analysis, family history of GI cancer showed significant associations with esophage-gastric cancer and colorectal cancer.

Discussion: GI cancer history in first relatives showed a significant association with development of GI cancer. Personal medical condition and life style were also important factors. Therefore, cancer screening should start with risk assessment with family history of GI cancer and personal medical condition. And individuals with high risk for GI cancers may be better to start screening GI cancer earlier.

Keywords: Family history of gastrointestinal cancer.

OP16-8
Adverse Outcomes after Cholecystectomy in Patients with Diabetes: A Nationwide Study
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Background: Outcomes after cholecystectomy in patients with diabetes are not completely understood. This study evaluated the association between preoperative diabetes and adverse event after cholecystectomy.

Methods: With the use of reimbursement claims from the Taiwan National Health Insurance system, we performed a population-based cohort study of 200,418 patients with and without diabetes undergoing cholecystectomy between 2004 and 2012. The adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of postoperative complications and mortality associated with preoperative diabetes were calculated in the multivariate logistic regressions after adjusted for sociodemographics and coexisting medical conditions.

Results: Compared with 169367 surgical patients without diabetes, those with preoperative diabetes (n = 31051) had increased risks of septicemia (OR 1.28, 95% CI 1.23–1.33), pneumonia (OR 1.16, 95% CI 1.08–1.26), stroke (OR 1.20, 95% CI 1.10–1.30), acute myocardial infarction (OR 1.44, 95% CI 1.14–1.82), acute renal failure (OR 1.51, 95% CI 1.36–1.69), and urinary tract infection (OR 1.45, 95% CI 1.37–1.54) after cholecystectomy. Mortality after cholecystectomy was not associated with preoperative mild diabetes.

Conclusion: Patients with diabetes had increased complications after cholecystectomy compared with people without diabetes. In particular, those with diabetes-related clinical indicators had higher mortality after cholecystectomy.

Keywords: Diabetes, Cholecystectomy, Adverse outcomes.

OP16-9
Building Up a Deceased Donor Organ Transplant Program: Challenges and Solutions
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Nevertheless transplantation activity depending mainly on the living donation (99%) and the available organs cover only about (5%) of the needs, so activation and build up a deceased donor transplantation program became a national task. In year 2012 the government established and activated a new institution to take over all the transplantation activity in the country.

The initial few people and the leader (champions) who agreed to start working on transplantation program experienced much excitement, airiness, frustration, absolute depression and continuous rejection. Resistance came from many quarters and was prevalent in large organizations and it was obvious among individual physicians with the their contentious attempts to alienate the others.

The champions did not gave up and demonstrated leadership role which supported by high rank officials and they continue creating favorable social, legal, cultural environments for the success of a transplant program, building national, regional and international relationships to help in acquiring and training all the personnel who are responsible for providing crucial support to the program, involving and using the mass media continuously.

The outline of the program was drawn and Directory (Manual) with instructions, general rules and guidelines were issued and put in for official use in April 2015. The rate of report of potential brain death donors increased, the first case in the country where a donated organ transferred from donating hospital to another one is reported. In addition the number of transplant operations increased by 26% challenges and obstacles are continued. But with education, practice and leadership the barriers could be overcome.

Abstracts
PP1-001  
Management of Insulinoma in Low Resources Setup  
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Insulinoma is uncommon endocrine tumors that have a prevalence of around 1 per 100,000 person-years. However, they represent the most common functioning endocrine tumor of the pancreas and is the main cause for hypoglycemia due to endogenous hyperinsulinism. In the presence of significant financial constraints in the patient population pancreatic insulinoma’s management is difficult.

We performed an analysis of a clinical series in order to study the clinical and biological spectrum of presentation, the preoperative imagistic diagnosis and results of the surgical approach in a backward and poor infrastructure set up in central India.

Between 2002–2015, 09 patients with symptoms suggesting an insulinoma were hospitalized in our department. All cases were presented with neuroglycopenic symptoms and 5 had history of unconsciousness. Preoperative localization of insulinomas was possible in 7 patients. Intraoperative ultrasound was performed in 3 patients. Enucleation was performed in 7 cases while in one case tumor was not palpable during the time of surgery patient underwent blind distal pancreatectomy and in one case multiple tumors were present in distal pancreas so distal pancreatectomy done. The dimensions of the tumor were more than 2 cm in most of the patients of enucleation group; 1 had multiple insulinomas; In 8 cases patients proved to have benign insulinomas at histological specimens. Following surgery, the symptoms disappear in all patients except one. The most common complication after enucleation was pancreatic fistula seen in two cases.

Presentation of Insulinoma in developing country is delayed due to late diagnosis and most of cases tumor size was more than 2 cm. Patients are younger and have aggressive neuroglycopenic symptoms.

Keywords: Insulinoma, Pancreatic tumor, Hypoglycaemia.

PP1-002  
A Case with Multifocal Mucinous Cystic Neoplasms of the Pancreas  
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Introduction: Mucinous cystic neoplasm (MCN) of pancreas is a rare disease. It almost occurs in women and is found in solitary in the pancreatic body or tail. The most characteristic histological finding of MCN is the presence of ovarian-type stroma.

Case Presentation: A 74-year-old woman was referred to our hospital with the complaint of diarrhea. There were no abnormal findings in the endoscopic study. Abdominal CT revealed two cystic tumors of 20 mm in diameter and 10 mm in diameter in the pancreatic head. Endoscopic ultrasonography showed two cystic tumors, one of which formed cyst in cyst and the other of which revealed grape-like appearance. Endoscopic retrograde pancreateography showed that the main pancreatic duct was dilated to 3 mm in diameter and there was no communication between the main pancreatic duct and the cystic lesions. The cytology of the pancreatic juice was class II. Pylorus-preserving pancreaticoduodenectomy was performed with the preoperative diagnoses of the concurrence of MCN and intraductal papillary mucinous neoplasm. Histopathological diagnosis resulted in benign MCNs with ovarian-type stromas in both of tumors.

Discussion: It is noted that MCN is ordinarily solitary in international consensus guidelines 2012 for the management of IPMN and MCN of the pancreas and there was no report on multifocal MCNs. We report this extremely rare case with multifocal MCNs in the pancreatic head.

Keywords: Multifocal, Mucinous, Cystic, Neoplasm, Pancreas.
**Conclusions:** NLR could be a predictive biomarker for malignant potential in IPMN.

**Keywords:** Intraductal papillary mucinous neoplasms, Malignant potential, Neutrophil-to-lymphocyte ratio.

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**PP1-004**

**Self-Expulsion of a Large Gallstone through a Cholecystocutaneous Fistula**

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**Background:** Cholecystocutaneous fistulae have been described since the 17th century. A complication of the past, its once common occurrence has since dwindled with the advent of early detection and definitive surgical treatment of cholecystitis. Cholecystocutaneous fistulae may occur spontaneously from chronic cholecystitis or can be formed via percutaneous tracts after cholecystostomy. Gallstones have been described to be extruded from these fistulae.

**Methods:** We present a case of a patient who had a cholecystocutaneous fistula from a previously performed percutaneous cholecystostomy. Two months after the tube was removed, the patient self-extruded a 4-centimetre gallstone through the fistula. He was otherwise well, and had no evidence of intra-abdominal sepsis.

**Results:** A 70-year-old gentleman was admitted for an acute myocardial infarction. At presentation, he also complained of pain and tenderness in the right hypochondrium. Computed Tomography revealed an acute cholecystitis with a large gallstone in the neck of the gallbladder. In view of his concomitant myocardial infarction, he underwent a percutaneous cholecystostomy and recovered well. On removal of the cholecystostomy drain, the track remained as a cholecystocutaneous fistula. Unfortunately the patient suffered from another myocardial infarction, and in view of his high cardiac and anaesthetic risk, the fistula was managed conservatively until cardiac revascularization. He later presented in the outpatient clinic with a large gallstone that he had expelled from the fistula after a bout of biliary colic.

**Conclusion:** Though uncommon, large gallstones can be extruded from cholecystocutaneous fistulae spontaneously. Cholecystocutaneous fistulae can form from not only chronic inflammation caused by chronic cholecystitis, but also previous percutaneous cholecystostomy drain sites. A review of the literature describes definitive surgical management with cholecystectomy and fistulectomy for such patients.

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**PP1-005**

**Incidentally Found Cholecysto-Gastric Fistula during Cholecystectomy Mimicking Gallbladder Cancer**

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Cholecystoenteric fistulas are rare complication of cholecystitis with cholelithiasis. Among them, cholecystogastric fistula is a rare type of fistula with variable clinical presentation. Most of case reports for choledochogastric fistula was founded incidentally during cholecystectomy for cholecystitis. Herein we describe an uncommon case of incidentally found cholecysto-gastric fistula during open cholecystectomy for mimicking gallbladder cancer.

**Keywords:** Fistula, Cholecystogastric fistula, Cholecystectomy, Gallbladder cancer.

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**PP1-006**

**Analysis of Clinical Characteristics and Treatment of Pancreatic Cystic Tumors**

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**Aims:** To summarize experience in the diagnosis and treatment of pancreatic cystic neoplasms.

**Methods:** This is a retrospective study of 207 patients who were diagnosed with pancreatic cystic tumors at Peking Union Medical College Hospital between Jan. 2009 and Mar. 2014. Clinical data, such as clinical manifestations, radiological and pathological images, and surgical recordings, were collected.

**Results:** Of the 207 included patients, females accounted for 76.81%, and the mean patient age was 52.04 years. Malignancy was more common in older patients who presented with marasmus and jaundice. Other risk factors included solid components in the tumor, a large tumor size, and elevated levels of tumor markers. Surgical treatment was required when a malignant tumor was suspected. The operation approach was selected based on the location, size and characteristics of the tumor. The position of the tumor relative to the pancreatic duct also played a significant role.

**Conclusions:** No specific symptoms were observed for the patients with pancreatic cystic tumors. Imaging played an important role in making a differential diagnosis. Furthermore, surgical treatment should be proposed for patients with significant symptoms and potentially malignant tumors. The tumor resection rate is high, suggestive of good prognosis.

**Keywords:** Cystic tumor, Diagnosis, Pancreatic cyst, Treatment.
PP1-007
Prevalence and Risk Factors of Gallbladder Polypoid Lesion in a Healthy Population
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Aim: To determine the prevalence of and investigate the risk factors for gallbladder (GB) polypoid lesion in a healthy population.

Materials and Methods: A total of 23,827 subjects who underwent abdominal ultrasonography in conjunction with health screening examinations were retrospectively analyzed. The prevalence of and risk factors for GB polypoid lesion were evaluated. In addition, risk factors according to the number of polypoid lesions and the presence of stones with polypoid lesion were investigated. To analyze risk factors, a control group was established in a 1:2 ratio matched for age and sex.

Results: The prevalence of GB polypoid lesion were identified in 9.96%. By multivariate analysis, chronic hepatitis B infection (CHB) and the presence of metabolic syndrome (MS) were significant independent risk factors for multiple GB polypoid lesions compared with the solitary GB polypoid lesion. In addition, gastric Heli- bacter pylori infection and MS were significant risk factors for GB polypoid lesion with stone compared with the GB polypoid lesion without stone.

Conclusion: The prevalence of GB polypoid lesion in a healthy Korean population was 9.96%. Patients with CHB and MS need to be carefully examined for such lesions.

Keywords: Gallbladder polypoid lesion, prevalence, Risk factors.

PP1-008
Lymphoepithelial Cyst of Pancreas: Two Cases Report
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Lymphoepithelial cyst (LEC) of the pancreas is an exceedingly rare nonneoplastic entity of uncertain histogenesis. LEC are true pancreatic cysts lined by squamous epithelium and surrounded by mature lymphoid tissue. The cyst arises typically in middle-aged men, and is usually asymptomatic or causes nonspecific abdominal symptoms. There is no specific serologic marker for this entity. None of its radiological characteristics can help differentiate it from other cystic lesions of the pancreas. Case 1: Sixty five year old gentleman had no specific symptom except indigestion for one month. Abdominal Computed Tomogram showed a distal pancreatic cystic mass. Endoscopic Ultrasonogram was revealed as ill marginated multiple cystic lesion with solid portion. Pancreatic cyst cytology and biopsy was done but suggested incomplete sampling only containing some macrophage and lymphocytes. Pancreatic MRI showed 3x1.8 cm oval and lobulated cystic tumor at the superior aspect of the pancreatic tail with T1-heterogenous low and T2-heterogenous high signal with bright spots and arterial hyperenhancement and subtle washout. He underwent distal pancreatectomy with Warshow type. Pathologic report lymphoepithelial cyst of the pancreas. He got smooth postoperative course and discharged POD 26 without complication. Case 2: Fifty one year old female was admitted severe epigastric pain intermittently for about two years. Abdominal Computerized Tomogram showed 2.2x1.4 cm sized cystic mass in pancreatic neck area. Endoscopic ultrasonogram showed heterogenous hypoeocic lesion with echogenic spot and cystic area in the neck of the pancreas. MRI suggested mucinous cystadenoma or oligocystic serous cystadenoma. She underwent pancreatic head cystic tumor excision without complication. So we reported two cases of lymphoepithelial cyst of the pancreas treated by laparoscopic distal pancreatectomy with Warshow type and pancreatic head cystic tumor excision with short literature review.

Keywords: Lymphoepithelial cyst, Pancreas.

PP1-009
A Case of Squamous Cell Carcinoma Arising from Gallbladder Producing Granulocyte Colony Stimulating Factor (G-CSF)
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Background: Tumors which produce G-CSF are observed in some carcinomas however there are few reports in gallbladder carcinoma. We report a rare case of gallbladder carcinoma producing G-CSF.

Case: A 61-year-old woman was referred to our hospital because of epigastric discomfort. Blood tests showed high leukocyte count and elevated SCC and hepatobiliary enzymes. Abdominal ultrasonography showed low echoic tumor of gallbladder and extension of bile duct. CT of the abdomen showed a large (5 cm) tumor in the gallbladder and multiple liver metastases. Abdominal MRI showed a heterogeneous high signal lesions on diffusion-weighted images. On admission, the peripheral leukocyte count and serum G-CSF were elevated to 20,000/mm³ and 97.8 pg/ml, respectively. Stenosis of the common bile duct was apparent by ERC, so we performed endoscopic nasobiliary drainage (ENBD). But we could not obtain malignant cells in bile cytology by ENBD. We diagnosed squamous cell carcinoma on the result of percutaneous needle biopsy for gallbladder tumor. We administered chemotherapy with CDPD followed by gemcitabine. But the therapeutic effect of anti-cancer drugs was not enough and the leukocyte count increased gradually up to 64,000/mm³. She died in approximately two months after the start of chemotherapy. She was diagnosed with squamous cell carcinoma of the gallbladder producing G-CSF from autopsy findings.

Conclusion: Carcinoma of the gallbladder associated with G-CSF production is very rare. Here we present this case along with a review of the literature.

Keywords: Gallbladder carcinoma.
PP1-010

Extrahepatic Bile Duct Cancer: Postoperative Radiotherapy Improves Survival Rates for Patients with High-Risk Features for Locoregional Recurrence

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Purpose: To investigate the outcome of postoperative radiotherapy (RT), through comparison of survival rate between surgery group and surgery plus postoperative RT group, and to identify the prognostic factors that affect survival in patients with extrahepatic bile duct (EHBD) cancer.

Methods and Materials: Between 2000 and 2013, 52 patients with EHBD cancer underwent curative surgery. Among 52 patients, 33 patients did not receive postoperative RT (Group I), and 19 patients received postoperative RT (Group II). There were significantly more patients with R1 resection in Group II. The median radiation dose was 5040cGy.

Results: The median follow-up duration was 24 months (range, 3–105). The 3-year overall survival rate for Group I and Group II was 38% and 56% (p = 0.274). The 3-year disease free survival (DFS) rate for Group I and Group II was 20% and 31% (p = 0.049) and the 3-year locoregional recurrence free survival (LRFS) rate was 19% and 58% (p = 0.002). Multivariate analyses showed that postoperative RT and lymphovascular invasion were independent prognostic factors for DFS and LRFS. A total of 42 patients (80%) experienced treatment failure. For Group I, there was statistically significant increased in overall locoregional failure rate compared with Group II (84% and 21% for Group I and Group II, p value = 0.000). For Group II, distant metastasis was predominant pattern of failure.

Conclusion: Postoperative RT after curative surgery appears to improve locoregional control and survival rate. The efforts are needed to reduce distant metastasis, which is major pattern of failure for patients who received postoperative RT.

Keywords: Extrahepatic bile duct cancer, Surgery, Postoperative radiotherapy.

PP1-011

Expression of Bile Acid Receptor TGR 5 in Gallbladder Cancer

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Background: TGR5 is a plasma membrane-bound, G-protein-coupled receptor for bile acids. It has been detected in various tissues, particularly in the biliary tree. Some reports have demonstrated that TGR5 expression is related to cancer development; however, almost all of these studies utilized knockout mice. In the present study, we determined the relationship between the strength of TGR5 expression and gallbladder cancer.

Methods: We retrospectively reviewed the medical records and immunohistochemistry data for the cancer tissues of 52 patients who underwent radical cholecystectomy for gallbladder cancer at our hospital between July 2004 and April 2013. Then we compared the data to those of 27 patients who underwent cholecystectomy for benign gallbladder disease, such as for gallbladder stones or benign polyps. We analyzed the staining pattern and TGR5 intensity and extent and categorized the samples into two groups: low and high staining. We also evaluated the relationship between the strength of TGR5 staining and cancer stage with patient survival.

Results: The overall strength of TGR5 staining was significantly higher in the gallbladder cancer group than in the benign group (p < 0.001). In the cancer group, high TGR5 staining was present in 32 patients (61.5%) and low staining was observed in only 20 patients (38.5%). However, in the benign group, low TGR5 staining was observed in 21 patients (77.8%) and high staining was observed in only six patients (22.2%) (p < 0.001). In addition, there was a statistically significant relationship between the strength of TGR5 expression and overall survival (p = 0.002).

Conclusions: We concluded that TGR5 is expressed much more in gallbladder cancer than in the normal gallbladder mucosa. Furthermore, we found a significant association between TGR5 expression and patient survival. Investigation of TGR5 expression in gallbladder cancer could be helpful for predicting prognosis.

Keywords: Gallbladder cancer, TGR5

PP1-012

Intraductal Papillary Neoplasm of the Bile Duct with Associated Invasive Carcinoma

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Intraductal papillary neoplasms of the bile duct (IPNB) have recently been proposed as one of the preinvasive lesions of cholangiocarcinoma. The reported malignant potential of IPNB ranges widely from 19.5% to as high as 83%. Due to the development to invasive cancer, IPNB is recommended to undergo definitive surgery. Herein, we report IPNB associated with invasive carcinoma. A 74-year-old male patient admitted hospital because of cholangiocarcinoma occurred in IPNB. The tumor markers, (CEA; 3.96 ng/ml and CA 19-9; 28.3 U/ml), were within normal limits. Magnetic resonance cholangiopancreatography (MRCP) findings showed papillomatosis of the bile duct. Preoperatively, biopsy was performed by endoscopic retrograde cholangiopancreatography (ERCP), and then the pathology revealed adenocarcinoma. Cholecdochoscopy finding during surgery showed IPNB up to right and left second order branch of the intrahepatic bile ducts, we performed a palliative Roux-en Y hepaticojejunostomy. Second case was 61-year-old male patient. He knew liver cyst 4 years ago, and visited a hospital because the size of the cyst gradually increased. The tumor markers, (CEA; 0.67 ng/ml and CA 19-9; 7.77 U/ml), were within normal limits. In the computed tomography imaging, there were a cystic mass with mixed component in left hemi liver. We performed laparoscopic left hemihepatectomy, and then the pa-
thology revealed IPNB, high-grade dysplasia with multifocal associated invasive carcinoma.

IPNB is a rare benign tumor that possesses a high potential for malignant transformation. Although IPNB is a rare disease, it requires increased attention due to its high malignant potential.

Keywords: Intraductal papillary neoplasm of the bile duct, Invasive carcinoma.

PP1-013
Sister Mary Joseph Nodule from a Hilar Cholangiocarcinoma – An Uncommon Site of Metastasis
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Background/Aims: Sister Mary Joseph nodules are pathognomonic of advanced metastatic disease of intra-abdominal origin, with the primary tumour most commonly found in the gastrointestinal tract, pancreas, or gynaecological organs. Rarely, they can also represent metastatic deposits from the bladder, lungs, or hepatobiliary system. To date, there have been less than 10 reported cases of Sister Mary Joseph nodules originating from cholangiocarcinoma.

Methods: A search of Pubmed was performed using the terms ‘Sister Mary Joseph’, ‘umbilical metastasis’, and ‘cholangiocarcinoma’. Articles reporting cases of metastatic umbilical nodules from cholangiocarcinoma were reviewed.

Results: We present a case of a Sister Mary Joseph nodule from an advanced hilar cholangiocarcinoma, its features and a brief review of the literature. The nodule was excised with histopathological confirmation as a metastatic cholangiocarcinoma nodule. This avoided additional invasive procedures for the biopsy of the hilar tumor and expedited the patient’s management.

Conclusion: Sister Mary Joseph nodules are an important clinical finding and prognostication tool in patients with intra-abdominal malignancy and histology can obtained with minimal morbidity.

PP1-014
Effects of Preoperative Sarcopenia on the Short-Term Results of Pancreatoduodenectomy for Bile Duct Cancer
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Background: Sarcopenia has been identified as a poor prognostic factor for gastroenterological diseases. However, the influence of sarcopenia on the outcomes of patients with bile duct cancer (BDC) is still not clear. The aim of the present study was to clarify the influence of preoperative sarcopenia on the short-term results of pancreatoduodenectomy (PD) for BDC.

Methods: Our population comprised 65 patients undergoing PD for BDC at our institution. We excluded those who underwent hepatopancreatoduodenectomy and had a history of chemotherapy. The quantity and quality of the skeletal muscle via computed tomography (CT) was used for the preoperative sarcopenia assessment. The quantity and quality of the skeletal muscle, indicated by the psoas muscle mass index (PMI, the cross-sectional area of the bilateral psoas muscle [cm²]/height² [m²]) and intramuscular adipose tissue content (IMAC, mean CT value of ROI of multifidus muscle [HU]/mean CT value of ROI of subcutaneous fat [HU]) were measured on preoperative plane CT images at the level of the third lumbar vertebra. Based on the highest sex-specific quartile, the patients were divided into 2 groups, and the short-term results were compared.

Results: There were 47 men and 18 women with a median age of 72 years (31–83 years). No significant differences in the short-term results were noted between the two groups classified by PMI. However, on classifying the groups by IMAC, the rate of pancreatic fistula and postoperative complications were lower in the low IMAC group than in the high IMAC group (p = 0.028 and p = 0.127, respectively). Moreover, the duration of the postoperative hospital stay was shorter in the low IMAC group than in the high IMAC group (25 vs. 33 days, p = 0.008).

Conclusions: A low preoperative quality of skeletal muscle may increase the risk of postoperative PF after PD for BDC.

Keywords: Preoperative sarcopenia, Bile duct cancer, Short-term results.
PP1-015
Prognostic Value of Tumor Marker Kinetics during Palliative Chemotherapy in Patients with Unresectable Gallbladder Adenocarcinoma

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Background/Aims: The prognostic value of CEA, CA 19-9 in gallbladder cancer (GBC) are poorly understood. This study was aimed to evaluate the relation between the changes in serum CEA and CA 19-9 levels and survival time during palliative chemotherapy in patients with unresectable GBC.

Methods: A total of 123 patients with pathologically confirmed unresectable GBC were included. Pre and post chemotherapy (2 cycles) levels of CEA and CA 19-9 were used. Changes in tumor markers were defined as the ratio of serum level pre and post chemotherapy. CEAchange = CEApost/CEApre, CA19-9change = CA199post/CA199pre, combined tumor marker as COMBchange = CEAchange x CA19-9change (= CEApost/CEApre x CA199post/CA199pre). The relation between survival and tumor marker changes were analyzed.

Results: Patients with decreased tumor markers (CEAchange, CA19-9change, COMBchange) had a better progression free survival (PFS) and overall survival (OS) compared with those with increased tumor markers (PFS with 5.9 vs. 2.3 months, 5.6 vs. 2.2 months, 5.3 vs. 2.1 months, respectively, and OS with 11.4 vs. 6.2 months, 9.6 vs. 6.6 months, 8.9 vs. 6.2 months, respectively). The pre & post CA19-9 ratio had the highest AUC value to predict 3-month PFS and one-year OS. Increased CA19-9 value during chemotherapy was an independent factors predicting PFS with an hazard ratio (HR) of 2.20 (p = 0.001) and also an independent factor predicting OS with an HR of 1.67 (p = 0.020).

Conclusion: CA 19-9 kinetics is a reliable factor predicting survival in patients with unresectable GBC receiving palliative chemotherapy.

Keywords: Gallbladder cancer, CA-19-9, Carcinoembryonic antigen, Survival.

PP1-016
Prognostic Factors Associated with Preoperative Clinicophysiological Outcomes of Distal Cholangiocarcinoma

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Background: Although biliary tract cancer is generally associated with a high mortality rate, patients with distal cholangiocarcinoma have better prognoses compared to those with periamplar cancer. This study aimed to determine preoperative clinicophysiological factors predictive of survival and recurrence in patients with distal cholangiocarcinoma.

Methods: Forty-five patients (34 men) with distal cholangiocarcinoma who underwent pancreaticoduodenectomy between 2005 and 2013 were examined retrospectively at our center and associated hospitals. Clinicophysiological parameters included predictors of overall survival (OS). Kaplan-Meier survival curves were generated and compared using log-rank tests, and Cox proportional hazard multivariate analyses were performed.

Results: The mean patient age was 68.8 years (range, 54–81 years), and patients had a median overall survival of 43 months and 1-, 3-, and 5-year OS rates of 91.1%, 61.1% and 40.4% respectively. Univariate analysis indicated that the body mass index, C-reactive protein (CRP) level, and carcinoembryonic antigen level were independent prognostic factors for OS; however, only the CRP level remained as an independent prognostic factor in a multivariate analysis.

Conclusion: A CRP level <0.3 mg/dl was predictive of a better outcome for patients with distal cholangiocarcinoma.

Keywords: Distal cholangiocarcinoma, C-reactive protein, Pancreaticoduodenectomy.

PP1-017
Surgical Outcomes after Radical Second Resection for Inapparent Gallbladder Carcinoma

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Background: Although the presence of residual disease at radical second resection for inapparent gallbladder carcinoma has been reported to be associated with decrease survival, the difference in survival according to its anatomic sites remains uncertain. This study aimed to clarify the impact of the anatomic site of residual disease on survival after radical second resection for inapparent gallbladder carcinoma.

Abstracts
Methods: A total of 29 patients who underwent radical second resection for inapparent gallbladder carcinoma were selected as our study cohort. Inapparent carcinoma was defined as a tumor first discovered histologically after cholecystectomy alone for presumed benign gallbladder disease. Of the 29 patients, 23 underwent open cholecystectomy and 6 underwent laparoscopic cholecystectomy as initial resection. Radical second resection was defined as an additional resection with regional lymphadenectomy, including wedge resection of the gallbladder bed and/or resection of the extrahepatic bile duct.

Results: For all 29 patients, the 5-year survival rate after resection was 80%. Of the 29 patients, 13 (45%) had residual disease at radical second resection. Survival after resection was significantly worse for patients with residual disease than for patients without, with 5-year survival rates of 53% and 100%, respectively (P = 0.005). The sites of residual disease included the gallbladder bed (n = 8), regional nodes (n = 8), bile duct (n = 2), and liver (n = 1). Of the 13 patient with residual disease, 10 had residual disease(s) at only the gallbladder bed and/or regional nodes and 3 had residual disease at the bile duct and/or liver; in the 10 patients, survival after resection was 75% at 5 years, whereas all the 3 patients died of the disease within 5 years after resection.

Conclusions: Radical second resection appears to be beneficial for patients with residual disease at only the gallbladder bed and/or regional lymph nodes.

Keywords: Inapparent gallbladder carcinoma.

PP1-018
Neuroendocrine Carcinoma of The Duodenal Papilla: Report of a Case
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Neuroendocrine carcinoma (NEC) of the duodenal papilla is very rare. NEC is generally reported to be rapidly progressing disease with very poor prognosis. Surgery has been an only effective treatment option for curing localized disease. However, there has been no concrete evidence for the strategy to control recurrent or metastatic diseases.

A 65-year-old man was referred to our hospital due to complaint of jaundice. Gastrointestinal endoscopy revealed an ulcerated and elevated mass at the papilla of Vater. The histopathology of the endoscopic biopsy demonstrated NEC. His symptoms and laboratory data did not show any abnormality on hormonal activities. No metastatic disease was found on imaging studies. Following biliary drainage by endoscopic retrograde tube placement, a radical pylorus-preserving pancreatoduodenectomy was performed.

Resected specimens showed an approximately 3 cm in diameter tumor of the duodenal papilla. Neither distant metastasis nor lymphnodes involvement of macroscopic inspection was found, however, lymphovascular and perineural invasion of the tumor were revealed in microscopic pathological findings. Specific immunohistochemical stain confirmed of positive for chromogranin, synaptophysin and Ki-67 score was 76.6%, which were compatible with NEC.

Adjuvant chemotherapy with Cisplatin and Camptothecin 11 (CPT-11) was done 12 courses after surgery. The patient developed multiple liver and pulmonary metastasis in 18 months after surgery. Therefore, regimen of chemotherapy has been converted to CPT-11 and Carboplatin. The patient expired on 41 months after surgery. We report a case of NEC of the papilla of Vater in this paper.

Keywords: Neuroendocrine carcinoma, Papilla of vater.
A Novel Method in Single Incision Laparoscopic Cholecystectomy without a Camera Operator

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Purpose: This study aimed to evaluate the implementation of solo surgery using a laparoscopic scope holder in the single incision laparoscopic cholecystectomy (SILC).

Method: With a glove port and a flexible high-definition scope, a SILC was performed through a trans-umbilical single incisional site with CO2 pneumoperitoneum with the pressure of 12 mm Hg. Seventy-four cases of SILC by a single surgeon were performed between July 2014 and June 2015. Fifty-eight cases of solo SILC using a scope holder (Solo-SILC) was compared with 15 cases of camera operator-assisted SILC (Ca-SILC) in the aspect of intraoperative and postoperative outcomes.

Result: Two cases of chronic cholecystitis and 13 cases of GB stones in Ca-SILC, 19 cases of cholecystitis including acute cholecystitis and chronic cholecystitis, gangrenous cholecystitis, 38 cases of GB stones and 1 case of GB polyp in Solo-SILC were included. One case in Ca-SILC and 3 in Solo-SILC were emergency cases. The mean BMI and operation time were 23.0 ± 3.6 kg/m² & 64.4 ± 16.6 min and 25.0 ± 3.8 kg/m² & 58.2 ± 27.1 min in Ca-SILC and Solo-SILC respectively (P = 0.067 and P = 0.167). Estimated blood loss was scanty and any additional assistance was confirmed using the choledochoscope, the choledochal balloon catheter or were irrigated with saline. After CBD clearance and all CBD stones were retrieved using a basket or a Fogarty balloon catheter or were irrigated with saline. After CBD clearance was confirmed using the choledochoscope, the cholecystotomy was closed with the bard absorbable suture material known as V-loc.

Conclusion: This report suggests that our novel technique, known as V-CBD, may represent a feasible and straightforward procedure for treating choledocholithiasis, especially when the CBD is not dilated.

Keywords: Cholecystolithiasis, Cholelithiasis, Laparoscopy.

Laparoscopic CBD Exploration Using a V-Shaped Choledochotomy

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Background: Laparoscopic common bile duct exploration (LCBDE) is a treatment modality for choledocholithiasis. The advantages of this technique are that it is less invasive than conventional open surgery and it permits single-stage management; however, other technical difficulties limit its use. The aim of this article is to introduce our novel technique for LCBDE, which may overcome some of the limitations of conventional LCBDE.

Methods: Since December 2013, ten patients have undergone LCBDE using a V-shaped choledochotomy (V-CBD). After the confluence of the cystic duct and the CBD were exposed, a V-shaped incision was made along the medial wall of the cystic duct and the lateral wall of the common hepatic duct, which comprise two sides of Calot’s triangle. The choledochoscope was inserted into the lumen of the CBD through a V-shaped incision, and all CBD stones were retrieved using a basket or a Fogarty balloon catheter or were irrigated with saline. After CBD clearance was confirmed using the choledochoscope, the cholecystotomy was closed with the bard absorbable suture material known as V-loc.

Results: The diameter of the CBD ranged from 8 to 30 mm, and the mean size of the stones was 11.6 ± 8.4 mm. The mean operative time was 97.8 ± 30.3 min, and the mean length of the postoperative hospital stay was 6.0 ± 4.6 days. All patients recovered without any postoperative complications, except for one patient who developed postoperative pancreatitis. No conversions to laparotomy were observed, and there were no recurrent stones and no need of T-tube insertion.

Conclusion: The aim of this retrospective study was to identify the risk factors associated with the severity characteristics in the Tokyo guidelines for conversion to open surgery in patients with acute cholecystitis (AC) who underwent laparoscopic cholecystectomy (LC).

Aim: The aim of this retrospective study was to identify the risk factors associated with the severity characteristics in the Tokyo guidelines for conversion to open surgery in patients with acute cholecystitis (AC) who underwent laparoscopic cholecystectomy (LC).

Method: A total of 225 patients were enrolled in the study. The patients were classified into two groups: a conversion group and a no-conversion group. The preoperative characteristics and therapeutic strategy were analyzed as risk factors for conversion to open surgery. The postoperative outcomes were also analyzed.

Result: Conversion to open surgery occurred in 29 patients (12.9%), including seven patients (6.7%) with mild AC and 22 patients (18.5%) with moderate AC. A univariate analysis showed that the risk factors for conversion to open surgery included a duration of symptoms longer than 72 hours, an elevated C-reactive protein (CRP) value and the Tokyo guidelines 2013 (TG 13) severity classification. The multivariate analysis showed that the risk factors for conversion to open surgery included a duration of symptoms longer than 72 hours and a CRP value >11.5 mg/dL.
Conclusions: A duration of symptoms longer than 72 hours, which is included in the criterion for moderate AC severity in the TG 13, was an independent risk factors for conversion to open surgery. In addition, adoption of a high CRP value as an additional criterion for moderate AC may increase the utility of the TG 13.

Keywords: Acute cholecystitis, Early laparoscopic cholecystectomy, Conversion to open surgery.

PP1-023
Short-Term Outcome of Laparoscopic Distal Pancreatectomy
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Introduction: We analyzed short-term outcome of laparoscopic distal pancreatectomy (LDP), and also reported on the management of the pancreatic stump.

Patients and Methods: We introduced LDP in 2011, and 10 cases were included in this study. Pancreatic resection was performed using laparoscopic linear stapler. For every case, we used a black or green cartridge for more than 10 min. A polyglycolic acid (PGA) sheet with fibrin glue was wrapped around the pancreatic stump to prevent the occurrence of a postoperative pancreatic fistula (POPF).

Result: A total of 10 patients (2 male and 8 female; age range, 10–76 years; median age, 67 years) underwent LDP. Their final diagnoses were as follows; pancreatic neuroendocrine tumor (three cases), pancreatic ductal adenocarcinoma (two cases), intraductal papillary mucinous neoplasm, mucinous cystic neoplasm, solid pseudopapillary neoplasm, serous cystic neoplasm, and chronic pancreatitis. Spleen preserving LDP was performed in one case; the remaining patients underwent conventional LDP. The operative time was 401 (range, 210–600) min, and the estimated blood loss was 66 (0–2200) g. POPF occurred in three cases, including two cases of grade A and one case of grade B. One case of grade IIa observed. The other cases did not develop any postoperative complications > IIIa of the Clavien-Dindo classification.

Conclusion: We reported the results of short-term outcome after LDP, and the management of the pancreatic stump. Appropriate pancreatic resection with wrapping of a PGA sheet using fibrin glue may reduce the occurrence of POPF.

Keywords: Pancreatic neoplasm, Laparoscopic distal pancreatectomy.

PP1-024
Laparoscopic Splenic Vessels Preserving Distal Pancreatectomy for Pancreatic Tumor
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Background: Laparoscopic distal pancreatectomy (LDP) surgery is rapidly spreading nationwide and gaining more popularity for pancreatic tumor of low grade malignancy, especially in regard to the splenic vessels preserving procedure. But there is relatively technical difficulty and risks for postoperative hemorrhage and splenic vessels occlusion.

Method: From 2009 to 2015, we reviewed the data of 21 patients who underwent LDP for pancreas tumor. In these 21 patients, we evaluated feasibility and safety of 6 cases that performed laparoscopic splenic vessel preserving distal pancreatectomy (LSVPDP) and short-term outcomes.

Result: Among the 6 pancreatic tumor, 2 were serous cystic neoplasm, 3 were neuroendocrine neoplasm (1 was insulinoma), and 1 was solid pseudopapillary neoplasm. 2 were males and 4 were females. Median age was 66 years (range 29–75). Median BMI was 23.9 kg/m². Median size of pancreas tumor was 20 mm (range 15–28) and thickness of resected parenchyma was 12 mm. Median operative time was 338 minutes (range 270–418). Estimated blood loss was 81 ml (range 10–175). Conversion to open surgery was not required in any case. Morbidity, such as postoperative hemorrhage, occlusive splenic vessels, pancreatic fistula was not observed. Mean hospital stay was 15 days (range 11–19). Mortality was nil. At a median follow-up of 13 months, local recurrence and distant metastases were not observed.

Conclusion: 6 cases of our LSVPDP is a safe and feasible approach for the treatment of the pancreatic tumor. An important and essential technique for the safety of this procedure not only the method of the pancreatectomy but also to expose and dissect the splenic vessels from the pancreas parenchyma precisely. Further experiences are needed to establish the standardized procedure for the spleen and splenic vessels preserving.

Keywords: Laparoscopic distal pancreatectomy, Splenic vessel preserving.

PP1-025
Percutaneous Cholecystostomy for Patients with ASA Classification more than 3
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Background/Aim: Percutaneous Cholecystostomy (PC) has been proposed as an effective bridge procedure before elective cholecystectomy for acute cholecystitis. But many centers have different indications of PC including old age, comorbidity, sepsis and...
liver function abnormality etc. Among them, we designed this study to evaluate the efficacy of PC in patients with acute cholecystitis and ASA classification more than 3.

**Methods:** For recent 3 years, we did PC in 29 patients with acute cholecystitis and ASA classification more than 3. We did PC as a bridge procedure before elective cholecystectomy (bridge group) in 20 patients and as a palliation of symptom in 9 patients (palliation group). We evaluated patients characteristics, complication rate after PC, ASA classification change before and after PC, resumption of oral intake after PC and success rate of laparoscopic cholecystectomy (LC) etc.

**Results:** Mean age of bridge group and palliation group were 72.7 ± 9.7 (Mean ± S.D.) and 75.3 ± 8.5 years old, respectively. Mean ASA classification before and after PC were 3.7 ± 0.5, 2.3 ± 0.8 and 4.0 ± 0.8, 3.4 ± 0.7, respectively in both group. There was only one complication after PC (peritonitis after PC, 3.4%), who is one of two mortality cases in palliation group (22.2%). Resumption of oral intake after PC was possible 3.2 ± 2.1 days after PC in bridge group and 3.0 ± 2.4 days in palliation group except two mortality cases. We tried 12 LC and one failed due to bile duct injury (success rate was 91.6%). Mean operation time for LC was 106.8 ± 32.5 which is a little bit longer than our elective LC.

**Conclusion:** PC is a good procedure for bridge procedure before elective LC and palliation of symptom in patients with acute cholecystitis and ASA classification more than 3.

**Keywords:** Laparoscopic cholecystectomy, Percutaneous cholecystostomy.

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**PP1-026**  
Robotic Pancreaticoduodenectomy: Single-Surgeon Initial Experience  
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**Background:** Minimally invasive surgery has gained increasing acceptance over the last few years, which has expanded to pancreaticoduodenectomy. Laparoscopic pancreaticoduodenectomy has been determined to be a feasible, safe, and even effective procedure in an experienced surgeon’s hands, but the adaptations to the clumsy instruments are needed. The improved dexterity of the Da Vinci robotic system provides a good opportunity to perform this challenging procedure in the minimally invasive context. The aim of this study was to share our preliminary experience of totally robotic pancreaticoduodenectomy.

**Methods:** From April 2015 to August 2015, four patients were selected to undergo totally robotic pancreaticoduodenectomy in the Department of Pancreatic Surgery, West China Hospital, Sichuan University, China. The demographic characteristics, perioperative details, and pathological results were retrospectively reviewed.

**Results:** One female and two male patients underwent totally robotic pancreaticoduodenectomy, while another male patient underwent robotic total pancreatectomy due to the severe atrophy of pancreatic body and tail. The mean age of the 4 patients was 56.8 years. The average operation time and intraoperative blood loss were 563 min and 228 ml respectively. No one needed blood transfusion, conversion to open pancreaticoduodenectomy, or postoperative analgesia. The postoperative courses of these patients were uneventful. The mean postoperative hospital stay was 10 days. No one required to be readmitted, and there was no death within 30 days following the surgery. Final pathologic examinations revealed one malignant pancreatic ductal adenocarcinoma, and three benign lesions.

**Conclusion:** Based on this initial study, RPD is safe and feasible, with acceptable oncological outcomes for highly selected patients in experienced surgeons’ hands.

**Keywords:** Da Vinci, Pancreaticoduodenectomy, Minimally invasive surgery.

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**PP1-027**  
Laparoscopic Splenectomy for Portal Hypertension Secondary to Liver Cirrhosis: Ligasure Combined with Ultrasound Scalpel versus Ultrasound Scalpel  
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**Introduction:** Hypersplenism and enriched collateral circulation due to liver cirrhosis increase the risk of hemorrhage, which is the leading cause of conversion to laparotomy. Recently, the vessel sealing system, LigaSure, has been widely used in laparoscopic surgeries. The purpose of this study is to compare two different instruments for laparoscopic splenectomy in liver cirrhotic patients with portal hypertension.

**Methods:** From June 2003 to June 2014, a total of 64 liver cirrhotic patients with portal hypertension receiving laparoscopic splenectomy were retrospectively reviewed. The patients were divided into Group 1 (n = 23), in which splenectomy was performed using ultrasound scalpel, and Group 2 (n = 41), in which LigaSure combined with ultrasound scalpel were applied. The demographic characteristics, and perioperative details were collected and compared between the two groups.

**Results:** No significant differences were detected regarding age, gender, Child-Pugh class, ASA, splenic length, and operation time between the two groups. Compared with Group 1, patients in Group 2 suffered less intraoperative blood loss (80.0/(50.0–100.0) ml vs. 100.0/(80.0–300.0) ml, P = 0.006). One case in each group (n = 1, 4.3% vs. n = 1, 2.4%, P = 0.674) required conversion to laparotomy due to bleeding from the splenic hilar vessels. The parameters including the incidence of postoperative complications, time to oral intake (28.2 ± 5.6 h vs. 28.0 ± 6.8 h, P = 0.906), and postoperative hospital stays (8.3 ± 3.1 d vs. 8.2 ± 2.7 d, P = 0.935) were comparable between the couple groups.

**Conclusions:** The application of LigaSure combined with ultrasound scalpel in laparoscopic splenectomy in patients with portal hypertension secondary to liver cirrhosis results in a decrease of blood loss. Therefore, this method should be recommended in a series of such laparoscopic surgeries.

**Keywords:** Laparoscopic splenectomy, Portal hypertension, LigaSure, Ultrasound scalpel.
PP1-028
Endovascular Embolization for Managing Anastomotic Bleeding after Stapled Roux-en-Y Choledochojejunostomy
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Aim: To evaluate the efficacy and safety of endovascular embolization for managing anastomotic bleeding after stapled Roux-en-Y choledochojejunostomy.

Method: Sixteen patients (seven men, nine women; mean age, 28.9 years; age range, 18–46 years) were diagnosed with anastomotic bleeding on digital subtraction angiography (DSA) after undergoing stapled Roux-en-Y choledochojejunostomy. The bleeding arteries were super-selectively catheterized and embolized with microcoils and/or gelatin foam. The results were analyzed.

Result: The bleeding arteries in all 16 patients were found to be located at the anastomotic site on DSA, and showed obvious leakage of the contrast agent. The arteries were successfully embolized in all patients. Drainage from the abdominal-cavity drainage tubes stopped after the procedure, and at the same time, laboratory examination indicated that the hemoglobin level and red blood cell count had stopped declining. None of the patients developed re-bleeding or any other complication during 15–30 days of follow-up.

Conclusion: Endovascular embolization is safe and effective for managing anastomotic bleeding after stapled Roux-en-Y choledochojejunostomy.

Keywords: Roux-en-Y choledochojejunostomy, Endovascular embolization, Anastomotic bleeding, Digital subtraction angiography, Stapler.

PP1-029
Outcomes of Open Distal Pancreatectomy: An Audit at Tertiary Care Hospital
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Objective: To analyze the factors contributing to the morbidity and mortality in post operative period after distal pancreatectomy with special focus on the formation of pancreatic fistula at Aga Khan University Hospital (AKUH) in last decade.

Material and Methodology: From January 2004 till December 2015, peri-operative and post operative data of 38 patients underwent distal pancreatectomy were recorded by using ICD 9 coding. Data was collected on designed performa for all patients for pancreatic/peripancreatic diseases. Variables were grouped into demographics, indications, operation details and postoperative course. SPSS version 20 was used for statistical analysis. Quantitative variables like age, operative time, ASA level, intra-operative blood loss and postoperative hospital stay are presented as mean with standard deviation or median with interquartile range depending on the distribution of data. Study endpoints for the risk factor analysis are surgical morbidity and the development of a pancreatic fistula. Univariate logistic regressions were performed associated with study endpoints. P value less than 0.05 will be considered significant.

Results: Post operative pancreatic fistula was the most common peri-operative morbidity. Associated factor for pancreatic fistula was multivisceral resection as compared to spleen preserving distal pancreatectomy and distal pancreatectomy (p-value: 0.039). While age, ASA level, BMI and blood transfusion were not statistically significant. However, the technique of stump closure when opted for suture technique was seen to be associated with higher occurrence of POPF. The mortality rate was 2.6%. Out of 8 patients with POPF, 7 were type A and B and managed conservatively however; one was type C and managed with endoscopy and surgical drainage.

Conclusion: Post operative pancreatic fistula is the most common complication seen after distal pancreatectomy as compared to other morbidity. The combination of stapler and suture closure shows superiority over suture closure alone. Prospective studies are needed for further establishment of this relationship.

Keywords: Distal pancreatectomy, Post operative pancreatic fistula.

PP1-030
Long-Term Outcome of Small Diameter Hepaticojejunostomy for Treatment of Post-Cholecystectomy Bile Duct Injuries
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Background/Aims: Bile duct injury (BDI) is the most dreadful complication of cholecystectomy. The aim of this study is to evaluate the long-term outcome of patients presented with post-cholecystectomy BDI and treated with small diameter hepaticojejunostomy (HJ) Roux-en-Y.

Method: Between January 1992 and December 2014, All patients who underwent HJ Roux-en-Y for treatment of post-cholecystectomy BDI were retrospectively studied. Group A (HJ with a diameter 10 mm or less) and group B (HJ with a diameter more than 10 mm). Long-term follow up was done for detection of the rate of anastomotic stricture.

Results: A total number of 320 patients were included in the study with 17 patients (5.3%) were missed during long-term follow up. Group A included 65 (20.3%) patients while group B included 255 (79.7%) patients. There was a significant difference in the level of injury between 2 groups (P = 0.015). The long-term follow up was performed after a median 75 months, range (2–246) for 303 patients. The overall long-term complications were higher within group A (16/63–25.4%) than group B (33/240–13.8%), (P = 0.025). The incidence of anastomotic stricture within group A was higher than group B (P = 0.024).

Conclusion: The incidence of anastomotic stricture is higher in small diameter hepaticojejunostomy. Technical skills are impor-
tant to ensure wide patent mucosa-to-mucosa hepaticojejunostomy to avoid development of anastomotic stricture.

**Keywords:** Bile duct injury, Hepaticojejunostomy, Cholecystectomy.

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**PP1-031**

**Choledochal Cyst: Their Clinical Presentation, Diagnosis and Treatment in Central Nepal: A Retrospective Study**

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**Background:** Choledochal cyst is a rare congenital malformation involving the cystic dilatation of intrahepatic or extra-hepatic or both bile duct. The estimated incidence is one in 1000 live birth in Asian population with female to male ratio 3:1.

**Objectives:** To study the presentation, diagnosis, treatment and outcome of choledochal cyst in College of Medical Sciences, Bharatpur, Nepal.

**Methods:** A retrospective review of the records of all the patients who were diagnosed as choledochal cyst and underwent medical or operative intervention in our hospital in the period of January 2013–January 2015.

**Results:** We have analyzed ten cases of choledochal cyst. The condition commonly affected the age group was 6–10 years with female preponderance (70%). Most common presenting symptom was pain abdomen (100%) followed by jaundice (50%). However classical triad of abdominal pain, jaundice, and an abdominal mass was not seen in any of the cases. Malignancy was not seen in any patients. Ultrasonography was found to be 100% accurate in diagnosis of choledochal cyst. Todani type I cyst was the most common type. Nine out of ten cases underwent complete cyst excision with cholecystectomy and Roux-en-Y hepaticojejunostomy without any major complication.

**Conclusion:** Choledochal cyst is a rare disease and commonly affects the age group of 6–10 yrs. Pain abdomen is the most common clinical presentation. Ultrasonography is very accurate for diagnosis of choledochal cyst. Complete cyst excision, cholecystectomy and internal drainage is the treatment of choice.

**Keywords:** Choledochal cyst, Ultrasonography, Roux-en-y hepaticojejunostomy.

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**PP1-032**

**Treatment Strategy for Perforation Related with Endoscopic Retrograde Cholangiopancreatography (ERCP)**

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**Background/Aims:** ERCP has taken an important role to diagnose and treat diseases. However, techniques related to ERCP require higher expertise than that of upper and lower gastrointestinal endoscopy. ERCP has been shown higher incidence of complications. Especially in cases of perforation during ERCP, it has demonstrated high mortality, 7–18% in Japanese study. Therefore, it is crucial to avoid misjudgments of the timing of operation and to avoid persisting conservative therapy.

In this study, we review 7 cases of ERCP related perforation; 4 cases required surgical treatment from the points of diagnosis and treatment with bibliographical consideration.

**Results:** During Jan 2010 and Sep 2013, ERCP methods were applied to 1678 cases. Complications were observed in 28.7% including post-ERCP pancreatitis, bleeding, stent problem, hyperglycemia, etc and perforation. Perforation was observed in 7 cases; 4 cases of them required surgical intervention though there was no mortality.

Perforations were observed in duodenum in 2 cases, pancreas in 1 case. Diagnosis was made by CT scan in 3 cases and leakage of contrast media in 1 case. Causes included injuries associated with balloon dilation in 2 cases, manipulation of endoscopy in 1 case and guide wire maneuvering for stent placement in 1 case. Timings of diagnosis were during ERCP in 2 cases, 3 hours after ERCP in 1 case and 48 hours after ERCP in 1 case. Surgical procedures were abdominal drainages in all cases. Mean hospital stay was 85 days though one case took 181 days.

**Conclusion:** When perforation occurred, we need to detect and diagnose it in early phase. It is inevitably important to manage patients’ general condition as well as cooperate with physicians. It is also a key to success that judging necessity and timing of surgical operation is made without persisting conventional methods.

**Keywords:** ERCP, Perforation.
PP1-033
Radical Resection and Enucleation in Chinese Adolescents with Pancreatic Tumors: A 15-Year Case Series
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Background: Pancreatic tumors rarely occur in adolescents, and the appropriateness of radical resection for these patients remains controversial.

Methods: Medical records were retrospectively reviewed for patients younger than 19 years who underwent radical resection or limited resection (enucleation) between 2000 and 2015. Patient demographics, clinical characteristics, operative details, growth and survival were analyzed.

Results: During the study period, 11 adolescents (mean age, 16.18 years; standard deviation, 1.99; range, 15.0–18.0) underwent radical resection (n = 7) or enucleation (n = 4) to treat solid pseudopapillary tumors (n = 5), pancreatic neuroendocrine tumors (n = 4), pancreatic neuroendocrine cancer (n = 1), or pancreatic ductal adenocarcinoma (n = 1). None of the 7 patients who underwent radical resection experienced recurrence or serious complications, while 3 of 4 patients who underwent enucleation experienced recurrence (P = 0.024). Recurrence-free survival was significantly longer in patients who underwent radical resection, and this procedure did not appear to affect adolescent growth and development.

Conclusion: Radical resection may be safe and effective for adolescents with pancreatic tumors.

Keywords: Pancreatic tumor, Adolescent, Survival, Radical resection, Growth.

PP1-034
Contribution of Pancreatic Mesenchymal Cells to Regeneration of Pancreas after Photochemical Injury in an Animal Model
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Background/Aims: There has been a report that numerous mesenchymal cells was observed in the regenerating human pancreatic tissue and then proved to be pancreatic stellate cells (PSC). The aim of our study is to clarify and strengthen the role of mesenchymal cells in the processes of the pancreas regeneration in an animal model.

Methods: We adopted previous our new animal model for photochemical-induced necrotizing pancreatitis. These components were consisted of mesenchymal cells, epithelial cells with tubular structures, and some regenerating acinar cells. Each portion of the component was different from each time period. At the early stage of the regeneration, mesenchymal cells occupied most of the illuminated area. These cells were stained with desmin and α-SMA, suggesting PSC. With the progression of regeneration, however, epithelial cells formed tubular complexes started to be observed at the periphery of the illuminated area and then replaced area of PSC progressively. They were initially appeared as spherical or cylindrical tubes of various sizes, and scattered separately or nestled with surrounding PSC. The epithelial cells became more swallowed with abundant cytoplasm, looking like real acinar cells, over time. It seems that epithelial cells might be transformed into acinar cells during the process of regeneration. At the late stage of the regeneration, tubular complexes with some newly appearing acinar cells were represented at the most of the illuminated area. Finally the illuminated area was totally replaced by normal pancreatic tissue.

Conclusion: The results of this animal study suggest that PSC is a key cellular component and play a leading role in the process of pancreas regeneration.

Keywords: Pancreas, Regeneration, Pancreatic stellate cell.

PP1-035
Preoperative Splenic Embolisation for Left Sided Portal Hypertension
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Aim: To make surgery in Lt sided portal hypertension safe.

Method: We present our experience of managing a patient of Lt. sided portal hypertension due pancreatic lesion compressing splenic vein, who underwent pre operative splenic artery embolization. A 23 year old lady presented with complaints of pain/ dargging sensation in abd mainly on the Lt. side of abdomen, increased menstrual bleeding and with one episode of hematemesis. On examination she was found to have massive splenomegaly up to umbilicus. Blood investigations showed anemia and thrombocytopenia. Abdominal imaging showed a mid body pancreatic lesion approx. of 5 cm in size with massive splenomegaly and large collaterals in the region of hilum, GE junction and retro peritoneum. Upper G.I. Endoscopy showed large varices in lower esophagus. In view Lt sided portal hypertension in order to decrease the blood loss patient was first subjected to angioembolization of splenic artery. She underwent Distal pancreaticectomy and splenectomy. During surgery the collaterals were collapsed and the entaire procedure could be completed with less than 100 ml of blood loss. Biopsy of the lesion showed Solid pseudo-papillary tumor of pancreas with congestive splenomegaly.

Result: Splenectomy is curative for Lt. sided portal hypertension. During the period of 2010–2015 we treated 6 cases of Lt. sided portal hypertension. Our average blood loss during these splenectomy is approx. 750 ml. Post angioembolisation patient’s platelet counts also improved. We found pre operative splenic artery
embolization a useful adjunct to decrease intraoperative blood loss and improved platelet counts.

**Conclusion:** Pre operative splenic artery embolization is a useful adjunct in patients of portal hypertension to improve platelet counts and to decrease blood loss especially in cases where apart from splenectomy other procedure also needs to be done.

**Keywords:** Left sided portal hypertension, Angioembolization, Splenectomy.

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**PP1-036**

**The Arc of Buhler: Special Considerations When Performing Pancreaticoduodenectomy**

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A 74-year-old female was diagnosed as having a carcinoma of the papilla of Vater. Preoperative computed tomography showed stenosis of the celiac trunk and an enlarged artery arising from the superior mesenteric artery (SMA) joining the root of the splenic artery. Since this artery communicated with the SMA and the celiac trunk, independently of the gastroduodenal and dorsal pancreatic arteries, it was considered to be the arc of Buhler (AOB). The arterial blood flow to the liver, spleen and stomach appeared to depend on the AOB, such that AOB preservation was considered to be essential. A subtotal stomach-preserving pancreaticoduodenectomy with preservation of the AOB was thus performed. Although AOB is a relatively infrequent type of arterial communication between the SMA and the celiac trunk, it needs to be preserved during pancreaticoduodenectomy when celiac trunk stenosis is present.

**Keywords:** Arc of buhler, Pancreaticoduodenectomy, Celiac trunk, Stenosis.

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**PP1-037**

**Gallstones Etiopathogenesis, Lith, Mucin Genes and Treatment**

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Gallstone is one of the more common and relatively costly conditions of the gastrointestinal system. Most gallstone cases involve individuals younger than 60 years of age, with the individuals aged 60 years and above representing 9% of the cases. There are many risk factors for gallstones. Lith and Mucin genes play important role for gallstones formation. Surgery is therapeutic way for gallstones cure. But in the future there will be probably used some drugs for prevention of gallstones.

Environmental factors account for 75% of gallstone formations. Genetic factors represent 25% of gallstone formations (ABCG8 Cholesterol transporter 11%: UGT1A1 Gilbert variant 6%). In gallstone cases, differences have also been found in miRNAs and miRNA expression. The role of nuclear receptors in gallstone formation should be investigated. Synthetic FXR (Farnesoid X receptor) agonists will be probably used in treatment in the future.

In the future A) individualized therapies based on lithogenic structure B) genetic therapies based on ABCG8, ABCB4, ABCB11, UGT1A C) treatments targeting environmental factors, e.g. estrogen, enterohepatic bacteria etc. will be discussed in the future. Non-drug primary protection (weight loss, exercise, diet modification) in individuals at normal risk or protection with medication (UDCA, nuclear receptor ligands, statin-ezetimibe) in individuals with markedly higher risk or profilaktik cholecystectomy will also be possible discussed.

**Keywords:** Gallstones, Genes, New therapy.

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**PP1-038**

**Early versus Delay Initiation in Adjuvant Treatment for Pancreatic Cancer**

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**Background:** Pancreatic ductal adenocarcinoma (PDAC) is a highly aggressive tumor with a tendency for early recurrence, even after curative resection. Although adjuvant treatment improves survival, it is not well described early initiation of adjuvant treatment shows better outcomes in patients with PDAC.

**Methods:** One hundred thirteen patients who underwent chemotherapy or chemoradiotherapy after curative resection of PDAC were enrolled retrospectively: 56 in early group and 57 in delay group according to the median value of the time to initiation treatment.

**Results:** The median time to start adjuvant treatment was 35 days (range, 20–83 days), and 71 patients underwent adjuvant treatment completely. The median overall survival was 39.1 vs. 21.1 months, and disease-free survival was 18.8 vs. 10.0 months in the early and delay groups, respectively (p = 0.018 and 0.034), during the median 20.3-month follow-up. Moreover, the patients who underwent early initiation of treatment tend to be higher survival rate than those who did not, although time to initiation of adjuvant treatment did not influence survival rate significantly, considering the completion of adjuvant treatment (p = 0.129 and = 0.195, respectively). On multivariate analysis, an incomplete of treatment (hazard ratio [HR]: 4.536, 95% confidence interval [CI]: 2.570–8.005), delay initiation of treatment (HR: 2.042, 95% CI: 1.143–3.988) were significantly associated with shorter overall survival.

**Conclusions:** We suggest that adjuvant treatment would be delivered earlier and completed for better outcomes in resected PDAC patients, if possible.

**Keywords:** Pancreatic cancer, Adjuvant treatment.
PP1-039
Pancreaticogastrostomy, Simple and Safe Technique
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Background: Pancreaticoduodenectomy (PD) is the treatment of choice for periampullary pancreatic tumors. This procedure carries a significant risk and morbidities, most of them are related to pancreatic anastomotic failure. Many techniques have been described to decrease the anastomotic leak rate and related complications, pancreaticogastrostomy (PG) is one of the techniques utilized to restore the pancreatic continuity after pancreatic head resection.

The aim of this study is to describe and evaluate our modified pancreaticogastrostomy technique.

Design: Retrospective review was done for all patients who underwent pancreaticoduodenectomy between 2008 to 2014 at King Faisal Specialist Hospital & Research Center (Gen. Org.)-Jeddah, Kingdom of Saudi Arabia.

Method: A total of 34 patients underwent a pancreaticoduodenectomy with pancreaticogastrostomy using our modified technique. Our reviewed variables include Indication for surgery, intra-operative and post-operative variables and post-operative complications.

Results: At King Faisal Specialist Hospital & Research Center (Gen. Org.)-Jeddah in group of patients who underwent pancreaticoduodenectomy (n = 34) including 20 males and 14 females, the mean age was 58.53 years (SD 14.1). The histopathology review post-operatively showed 7 benign cases and 27 malignant cases. The indications for pancreaticoduodenectomy based on the histopathology have been divided into 5 main categories: adenocarcinomas, neuroendocrine tumors, intra-ductal tumors, cystic lesions of the pancreas, trauma and others including inflammations and fibrosis. The mean tumor size was 3.23 cm in diameter (range, 0–11 cm) with (0–6) no of lymph node involvement. There was a vascular invasion in 23.5% of the cases.

The highest morbidity in our series following pancreaticoduodenectomy was, wound infection (20.5%), atelectasis (14.7%), delayed gastric emptying (8.8%). Others include Intra-operative and post-operative hemorrhage, abscesses and collections, wound dehiscence and Pulmonary embolism (PE) counted for 5.8% of the complications. biliary fistulas, Lymphatic duct injury and deep venous thrombosis (DVT) occurred in 2.9% of the patients.

Conclusion: Pancreatic stump invagination into the gastric lumen with a two layers fixation of the ventral surface of the pancreas might be associated with a lower risk of pancreatic anastomosis failure. Further prospective validation with a larger number of cases are needed to Support our finding.

PP1-040
Initial Experience with Radical Antegrade Modular Pancreatectosplenectomy in a Single Institution
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Introduction: Radical antegrade modular pancreatectosplenectomy (RAMPS) is expected to be favorable for obtaining the negative tangential margin with onologic feasibility through the horizontal dissection in a right-to-left fashion for radical lymph node dissections.

Methods: From January 2007 to February 2015, a total of 30 RAMPS and 19 conventional distal pancreatectomy (DP) cases were enrolled. The demographics, perioperative and survival outcomes were compared according to the type of surgery.

Results: The mean operative time, blood loss and length of hospital stay were similar between two groups. Morbidities were reported in 14 cases of RAMPS (46.7%) and 8 cases of DP (42.1%) (p = 0.777). The rate of negative tangential margin (96.2%) and the number of harvested lymph nodes (21.5 ± 8.3) were significantly higher in RAMPS group (p = 0.011, p = 0.003, respectively). In terms of survival outcomes, there was no significant difference in regard to the overall 3-year disease-free survival (DFS; 30.4% in RAMPS vs. 35.0% in DP, p = 0.354) or overall survival (OS; 29.9% vs. 29.4%, p = 0.429) between the two groups. After exclusion of cases with nodal invasion, however, the RAMPS group had a longer DFS than the DP group (55.6% vs. 27.3%, p = 0.048) although OS was similar without significant difference (42.4% vs. 27.3%, p = 0.197).

Conclusion: RAMPS is a safe and oncologically feasible procedure in left-sided pancreatic cancer by obtaining a successful negative tangential margin and radical lymph node dissection. The authors suggest it could also be useful for local control, especially for the limited left-sided pancreatic cancer without nodal invasion.

Keywords: Radical antegrade modular pancreatectosplenectomy, Distal pancreatectomy, Left-sided pancreas cancer.

PP1-041
Gemcitabine-Induced Interstitial Pneumonitis
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Gemcitabine is the current standard of care in the treatment of pancreatic and biliary cancers. Adverse effects of gemcitabine were known to be bone marrow suppression, transient liver enzyme elevation, proteinuria, hematuria, respiratory problems and so on. Pulmonary toxicities due to gemcitabine were often reported, but serious pulmonary toxicities are extremely uncommon.
Here we present the two cases of gemcitabine-induced pneumonitis encountered during treatment of pancreatic and biliary cancer.

A 75-year-old woman being treated for stage II ampulla of Vater cancer developed respiratory symptoms after 3rd dose of gemcitabine 1000 mg/m². The radiographic findings on computed tomography evolved from ground glass opacities to findings suggestive of cryptogenic organizing pneumonia. She was treated with antibiotics and prednisone. Her respiratory symptoms and follow-up CT were improved. Chemotherapy was stopped and she was treated by conservative treatment.

A 63-year-old woman complained abdominal discomfort and weight loss. She was diagnosed pancreatic tail cancer with liver, LN metastasis. She was treated for 7th induction therapy (gemcitabine, Erlotinib) and 2nd maintenance therapy. She had fever at admission for 3rd maintenance chemotherapy and it was suspected pneumonitis. The CT finding was perilobular consolidation, ground glass opacities and interlobular thickening to findings suggestive of cryptogenic organizing pneumonia. She was treated with antibiotics and prednisone. The patient showed a rapid good response to radiotherapy but she was getting worse. The patient expired after 4 months from stopped chemotherapy.

We report the cases of gemcitabine-induced interstitial pneumonitis. Physicians finding the patients who have respiratory symptoms after treated gemcitabine chemotherapy should be aware of gemcitabine-induced pneumonitis and should need steroid therapy rapidly.

**Keywords:** Gemcitabine, Drug induced pneumonitis.

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**PP1-042**  
**Circulating Tumor Cells in Pancreatic Cancer Patients: The Efficacy in Diagnosis and Its Prognostic Value**  
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**Background:** Detection of circulating tumor cells (CTCs) has become widely used as a liquid biopsy for many patients. In pancreatic cancer patients, there have been a number of published reports on the efficacy of CTCs in the diagnosis and prognosis of pancreatic cancer, and in the evaluation of response to treatment.

**Method:** MEDLINE, EMBASE, the Cochrane Library, and the Chinese National Knowledge Infrastructure database were searched through May 2016. We systematically reviewed the diagnosis efficiency and prognostic value of CTCs reported in the literature.

**Result:** We found that the frequency of CTCs is rare, limited to a certain degree by the current enrichment and detection methodologies. The sensitivity of CTCs for diagnosis is variable likely due to the different stages of the disease at the time of diagnosis (varied from 25.0% to 100.0%) but specificity remained relatively high (varied from 99.7% to 100.0%). However, patients with CTCs positivity had worse overall survival than patients with CTCs negativity (hazard ratio = 1.558, 95% confidence interval 1.238 to 1.961, I² = 43.8%).

**Conclusion:** CTCs could be used as magic tools to help us with the prognosis prediction in pancreatic cancer patients.

**Keywords:** Pancreatic cancer, Liquid biopsy, Circulating tumor cell, Survival, Efficacy.

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**PP1-043**  
**HABP1 Expressions in pancreatic Ductal Adenocarcinoma Patients**  
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**Background:** Hyaluronan-binding protein 1 (HABP1) overexpression has been detected in several malignancies. However, little is known about the HABP1 expressions in pancreatic ductal adenocarcinoma (PDCA) patients. Thus we aim to investigate HABP1 expressions in PDCA patients.

**Methods:** In this retrospective study, HABP1 expressions were evaluated in 47 PDCA specimens. Kaplan–Meier curves were used to analyze survivals. Cox regression was used for analysis of prognostic factors.

**Results:** HABP1 expressions were significantly higher in tumor issues when compared with adjacent normal tissues. In tumor issues, HABP1 expressions were detected on nucleus, cytoplasm and cell surface. HABP1 staining was mainly localized in the nucleus. Advanced pathological stage [hazard ratios (HR) = 2.81, 95% confidence interval (CI) 1.44 to 5.48, P = 0.003], lymph nodemetsasis (HR = 3.25, 95% CI 1.61 to 6.55, P = 0.001), vascular invasion (HR = 2.90, 95% CI 1.16 to 7.26, P = 0.023), and high cytoplasm HABP1 expressions (HR = 3.86, 95% CI 1.30 to 11.49, P = 0.015) were associated with poor prognosis. Survivals were similar between patients with high nucleus expressions and low to moderate HABP1 expressions (HR = 2.90, 95% CI 1.16 to 7.26, P = 0.023), and high cytoplasm HABP1 expressions (HR = 3.86, 95% CI 1.30 to 11.49, P = 0.015) were associated with poor prognosis. Survivals were similar between patients with high nucleus expressions and low to moderate nucleus expressions (21.0 ± 2.9 months vs. 21.6 ± 3.8 months, P = 0.963). Patients with a high cytoplasm HABP1 expressions suffered significantly worse OS than patients with low to moderate expressions (8.8 ± 2.1 months vs. 22.9 ± 2.6 months, P = 0.008). Highly selected patients (high nuclear HABP1 expression, and positive cytoplasm HABP1) suffered significantly worse survivals (13.1 ± 2.7 months vs. 24.0 ± 2.9 months, P = 0.043).

**Conclusion:** High HABP1 expressions may predict prognosis in PDCA patients, especially in selected patients.

**Keywords:** Pancreatic ductal adenocarcinoma, Hyaluronan binding protein 1, Surgery, Survival, Immunohistochemistry.
Multiple Primary Neoplasms in Patients with Pancreatic Cancer

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**Background/Aim:** Pancreatic cancer is one of the malignant disease with the worst prognosis. However, due to the improvement of treatment in recent years, multiple primary neoplasms from the other organs in pancreatic cancer patients may appear occasionally. The present study was designed to define the clinicopathological characteristics of multiple cancers in patients with pancreatic cancer who underwent curative resection, in order to clarify the risk factors and prognostic significance.

**Method:** A total of 139 patients who underwent curative pancreatic resection with pancreatic cancer from 2004 to 2015 were enrolled. Patients with intraductal papillary mucinous neoplasm were excluded from this study. Patients' demographics, clinicopathological parameters and survival rates were compared between solitary pancreatic cancer and multiple primary neoplasms with pancreatic cancer.

**Results:** Fourteen patients (9.9%) of them were found to have multiple primary cancers. Triple cancers were found in 1 of those patients. The mean age of the 14 patients was 70 years, and male-to-female ratio was 9:5. Seven patients occurred pancreatic cancer after resection of other organ malignancies. The median time between other malignancy and pancreatic cancer were 30 months. Four had synchronous multiple cancers. Three occurred other organ malignancies after resection of pancreatic cancer. The sites of other organ cancers were the lung in 4 cases, breast in 2 cases, prostate in 2 cases, stomach, colon, liver, bile duct, skin, and lung and breast (triple cancers) in 1 case, respectively. Although six patients died after pancreatic resection, five of them died because of pancreatic cancer.

**Conclusion:** The prognosis of the patients with multiple primary neoplasm with pancreatic cancer were strongly associated with pancreatic cancer, independent of the order of appearance. It suggested that pancreatic cancer patients with multiple primary neoplasms should be treated proactively as same as solitary pancreatic cancer patients.

**Keywords:** Multiple primary cancer, Pancreatic cancer.

Intra-Ampullary Protruding Mass: Unusual Presentation of Neuroendocrine Tumor of the Pancreas

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We report a rare case of neuroendocrine tumor of the pancreas presented with intra-ampullary protruding mass. A 58-year-old man was referred to our hospital with impression of ampulla of Vater cancer on local esophagogastroduodenoscopy. He had a weight loss of 10 kg over past 6 months. The biochemical tests were shown as follows: total bilirubin 5.9 mg/dl (normal range: 0.3 to 1.2), aspartate aminotransferase 344 U/L (<50), alanine aminotransferase 833 U/L (<50), alkaline phosphatase 820 U/L (30 to 120), gamma glutamyl transpeptidase 566 U/L (9 to 64), amylase 63 U/L (22 to 80), lipase 52 U/L (<67). Cancer antigen (CA) 19-9 was 156.5 U/ml (normal value <27 U/ml). Abdominal computed tomography scan showed dilatation of intrahepatic and extrahepatic bile duct and main pancreatic duct with abrupt distal common bile duct narrowing and a suspicious hyperdense lesion in the head of the pancreas. Magnetic resonance cholangiopancreatography revealed intraductal filling defects in the dilated pancreatic duct of the head portion and distal common bile duct narrowing and upstream bile duct dilatation. Under the impression of pancreatic head cancer, endoscopic retrograde cholangiopancreatography was performed. The major papilla was slightly enlarged, and a pinkish solid mass was noted at the papillary orifice. In this situation standard cannulation into biliary and pancreatic duct seemed to be impossible, needle knife precut was performed and revealed it to be an intra-ampullary soft mass protruding from the pancreas head. A biopsy was performed and the pathology revealed neuroendocrine cells. We performed pylorus-preserving pancreaticoduodenectomy. The pathology of the specimen showed neuroendocrine tumor, 40 x 10 mm in size, grade 2, beyond the pancreas (T3), metastasis to regional lymph nodes (2/25), mitosis 1/10 HPFs. The immunohistochemical stains was positive for CD56, chromogranin, and synaptophysin. Ki-67 was about 5%.

**Keywords:** Neuroendocrine tumor, Pancreas, Endoscopic feature.

Prognostic Value of Fluorodeoxyglucose Positron Emission Tomography in Patient with Unresectable Pancreatic Cancer Treated with Chemotherapy

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**Objectives:** We investigated the prognostic role of 18F-Fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) in the prediction of progression free survival.
(PFS) and chemotherapeutic response in patients with unresectable pancreatic cancer treated with gemcitabine based chemotherapy.

**Methods:** A total of 32 patients with unresectable pancreatic cancer who underwent FDG PET/CT scanning before palliative gemcitabine based chemotherapy enrolled this study. Maximum standardized uptake value (SUVmax) of the primary tumor was measured by FDG PET/CT. Chemotherapeutic response was evaluated by Response Evaluation Criteria in Solid Tumors criteria.

**Results:** All pancreatic tumors showed measurable FDG uptake (median SUVmax = 6.5, range 2.0–13.5). The median SUVmax values among the response groups showed significant difference (P = 0.045) and chemotherapeutic responses were significant different according to SUVmax level (P = 0.042). PFS was significantly shorter in the high SUVmax (≥6.5) group than in the low SUVmax (<6.5) group (1.9 vs. 7.5 months, P < 0.001). Multivariate analysis showed that SUVmax was an independent prognostic factor for predicting PFS (P = 0.033).

**Conclusions:** Pretreatment SUVmax on FDG PET/CT provided prognostic information in patients with unresectable pancreatic cancer who received gemcitabine based chemotherapy. Higher SUVmax of primary pancreatic tumor is associated with poor PFS and also SUVmax is associated with chemotherapeutic response.

**Keywords:** PET, CT, Progression free survival, Prognosis, Chemotherapy, Pancreatic cancer.

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**PP1-048**

**Two Case Trials of Neoadjuvant Chemoradiotherapy with TS-1+Gemcitabine+50Gy Radiotherapy in Unresectable (Borderline Resectable) Pancreas Body Cancer**

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**Background:** Pancreatic cancer has a dismal prognosis. Especially in advanced stage, there is no standard therapy. But, several studies showed us higher rates of negative margin and better survival with neoadjuvant therapy for unresectable (borderline resectable) pancreatic cancer.

**Aim:** We report two cases of complete resection with negative resection margin in unresectable (borderline resectable) pancreas body cancer after neoadjuvant chemoradiotherapy.

**Method:** Enrolled two patients had pancreas body cancer with celiac trunk encasement. They were diagnosed with unresectable (borderline resectable) pancreatic body cancer. They received neoadjuvant chemoradiation regimen with TS-1 (80 mg/BSA, alternate day, for 5 weeks) and Gemcitabine (1000 mg/BSA, at 1, 8 day, for 3 weeks) plus concurrent radiotherapy (50 Gy).

**Result:** After neoadjuvant chemoradiation therapy, follow up study shows regression of tumor. They received surgery for remained cancer, and negative resection margin were achieved. All of them had experienced 1 episode of NCI grade 3 myelosuppression after gemcitabine IV infusion. One patient had experienced postoperative intestinal obstruction and enterocutaneous fistula, and another had experienced postoperative acute renal failure. We don’t think both complications were related to neoadjuvant chemoradiotherapy. They all recovered from complication, and survived until now (Survival months were 8, 11 months, respectively).

**Conclusion:** Our trial for unresectable (borderline resectable) pancreas body cancer can be a promising option. But controlled randomized trials are needed.

**Keywords:** Pancreas cancer, Neoadjuvant chemoradiation.
Cholangiocarcinoma is a malignant neoplasm originating from biliary epithelial cells. The incidence and mortality of disease are rising in the world. Currently, cholangiocarcinoma is accepted as stem cell disease. There are many risk factors for cholangiocarcinoma. Diagnosis of disease is easy but therapy of disease is quite difficult. Surgical resection and liver transplantation are the best therapies for the disease.

Treatment is usually divided in 3 main groups: 1) endobiliary treatments 2) limited pharmacotherapy and 3) surgical treatment. In hilar cholangiocarcinoma; as curative therapy: 1) local excision 2) combined partial hepatectomy 3) ex situ vivo liver resection and autotransplantation 4) orthotopic liver transplantation 5) central lobe resection 6) neoadjuvant/adjuvant therapies may be given. As palliative therapy: 1) palliative surgical treatment 2) endoscopic stent 3) percutaneous stent 4) photodynamic treatment 5) intraluminal brachytherapy 6) external radiation and systemic chemotherapy may be administered.

In conclusion, cholangiocellular carcinoma is a malignant disease which is suggested to be a stem cell disease triggered by inflammation, environmental and genetic factors. It originates from bile ducts and has a poor diagnosis. Future advances in the etiopathogenesis of the disease will contribute to a better understanding of the condition and its better treatment.

Keywords: Cholangiocarcinoma, Stem cell disease, Therapy.

A Borderline Resectable Pancreatic Head Cancer Successfully Resected after Gemcitabine+Nab-PTX Neoadjuvant Chemotherapy

Background: The combination chemotherapy of Gemcitabine (GEM) and albumin bound paclitaxel (nab-PTX) are widely used for unresectable pancreatic cancer. However, there are few reports of its effectiveness as Neoadjuvant therapy. We report a R0 resected case of advanced pancreatic head cancer after GEM+nab-PTX chemotherapy.

Case: A 72-year-old man with obstructive jaundice was referred to our hospital. MDCT showed pancreatic head cancer contact with portal vein more than 180 degree. Histological confirmation was performed with endoscopic ultrasound fine-needle aspiration biopsy. The patients treated with GEM and nab-PTX as neoadjuvant chemotherapy (3 cycles of 800 mg/m² of GEM and 100 mg/m² of nab-PTX on day1 and 8 every 21 days). No severe adverse events were seen during these courses. The tumor diameter and serum CA19-9 level were decreased from 24 to 13 mm (PR) and from 4183 to 94 U/ml, respectively, although there was only slight improvement in the contact to PV. The patient underwent pancreaticoduodenectomy and there was no severe post-operative complication. Histological examination revealed margin negative and grade Ib histological response to NAC in Evan’s classification. The patients survives for 4 months postoperatively without recurrence, so far.

Conclusion: The patient successfully treated with GEM + nab-PTX as NAC following surgical resection. GEM + nab-PTX is safe and effective as neoadjuvant therapy for patients with borderline pancreatic cancer. In the presentation, we will show our recent experiences of patients treated with GEM+nab-PTX as NAC.

Keywords: Borderline Resectable pancreatic head cancer, Neoadjuvant therapy.
Schwannomas of the gastrointestinal tract are relatively uncommon and rarely involve the large intestine. Although considered benign, they may recur locally (if incompletely excised), and malignant transformation is occasionally observed. Radical surgery is, therefore, the accepted standard of treatment. While accurate diagnosis prior to surgical intervention can aid in therapeutic planning, limitations of conventional imaging and lack of sufficient biopsy material usually make this difficult. We report here an instance of schwannoma of the sigmoid colon, confirmed by immunohistochemistry, for which segmental resection of the sigmoid colon was performed. An 81-year-old male have had imatinib medication for gastrointestinal stromal tumor of the small bowel with intraperitoneal metastasis for about 4 years. In regular follow up studies he had recently bowel habit change. On colonoscopy, an ulcerative polypoid lesion of the sigmoid colon was discovered. Abdominal computed tomogram showed a 2 cm sized well circumscribed mass in the sigmoid colon suggesting disease progression. He underwent abdominal exploration for ruling out the gastrointestinal stromal tumor recurrence and sigmoid colon segmental resection. Pathology was revealed as the schwannoma of the sigmoid colon. Postoperatively, the patient recovered and has done well with no recurrence. So we report a case of schwannoma of the sigmoid colon in patient during imatinib treatment with short literature re view.

Keywords: Schwannoma, Colon, Gastrointestinal stromal tumor.

Histopathological Assessment of Rectal Biopsy in Children with Chronic Refractory Constipation: A 6 Year Review of Cases Seen in a Tertiary Hospital in Ghana

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Background: Children with chronic constipation dating to infancy frequently undergo rectal biopsy in order to rule out Hirschsprung’s disease which is the most common cause of this sort of presentation. Few publications have however focused on the epidemiology of the histological findings with the aim of documenting the proportion of such patients who truly have Hirschsprung’s disease. In this preliminary work, we aim to present the histopathological findings of children who had rectal biopsies in our centre from 2009 to 2014.

Method: A retrospective study was undertaken to review the histopathology reports of all rectal biopsies submitted to the Department of Pathology of the Komfo Anokye Teaching Hospital, Kumasi from 2009 to 2014 on account of refractory constipation and suspected Hirschsprung’s disease. Patient’s biodata, clinical signs and symptoms were extracted from the request form.

Result: 88 cases were seen during the study period with male to female ratio 2.8: 1 and age range 6 months to 10 years. The modal age range is 24–36 months. Seventy six of the specimens were adequate for histopathological assessment with 64 cases confirmed as Hirschsprung’s disease while 12 cases were normal. Out of the confirmed cases, 3 cases showed absence of ganglion cells but no hypertrophy of nerve fibres.

Conclusion: This preliminary work reveals that Hirschsprung’s disease is rarely confirmed by biopsy in early infancy in our setting due to late presentation, although the epidemiology of the disease is similar to that reported elsewhere.

Keywords: Rectal biopsy, Chronic constipation, Hirschsprung’s disease.

Improving the Quality of Bowel Preparation for Screening Colonoscopy by Adjunctive Metoclopramide

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Background and Aims: Colonoscopy is commonly used to screen for colorectal abnormalities, including cancer and precancerous conditions. In practice, various agents are used for bowel cleansing before colonoscopy. However, the efficacy of prokinetics as adjunctive agent is still remains unclear. In this study, we investigated the usefulness of metoclopramide as adjunctive agent for bowel cleansing with polyethylene glycol and ascorbic acid.

Methods: This study was designed with a prospective, randomized, comparative study for adjunctive metoclopramide in bowel cleansing. A total of 192 patients were enrolled in this study and randomly assigned to control group (n = 96) or study group with metoclopramide (n = 96). For study group, 10 mg of metoclopramide was orally administered about 30 minutes before split-dose of 2 litter polyethylene glycol and ascorbic acid (PEG+Asc). The experimental parameters included bowel cleansing quality, adenoma detection rate, and patient’s compliance. The questionnaire reporting the acceptability and tolerability were collected from patients, and colonoscopy results were analyzed.

Result: Oral metoclopramide with PEG+Asc showed a significant improvement of bowel cleansing quality. There was a significant difference in total Boston bowel preparation scale (metoclopramide vs. control; 7.6 ± 1.6 vs. 6.6 ± 1.4; p = 0.001). Adequate cleansing were shown in 96% (95% CI 91–99) of metoclopramide group and 93% (95% CI 88–98) of control group. However, there was no significant difference in time for first defecation, comple-
tion of bowel cleansing, and adenoma detection rate between the groups. Abdominal fullness during bowel preparation was attenuated by oral metoclopramide as adjunctive agent.

**Conclusion:** Oral metoclopramide during bowel cleansing is effective to improve the quality of colonoscopy with split dose PEG+Asc. It can be helpful to decrease the uncomfortable symptoms and improve patient’s compliance for colonoscopy.

**Keywords:** Colonoscopy, Bowel cleansing, Metoclopramide.

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**PP1-055**

**A Comparison of Bowel Preparation between 3L Ascorbic Acid Mixed PEG and Combination of 2L Ascorbic Acid Mixed PEG with Bisacodyl**

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**Background and Aims:** Recently a low-volume polyethylene glycol containing ascorbic acid (PEG-Asc) formulation has proven as safe and effective as traditional 4-L PEG solutions for colonoscopy preparation. However, currently available aqueous purgative formulations are poorly tolerated. The aim of this study was to compare a split-dose 2-L PEG-Asc and a 1-L PEG-Asc with bisacodyl (10 mg) formulation for quality of bowel cleansing while preparing for colonoscopy and patient compliance.

**Methods:** A single center, randomized, observer-blinded study was performed between May 2015 and September 2015. Two hundred outpatients were prospectively enrolled. Patients referred for colonoscopy were divided into two groups: the split-dose 2-L PEG-Asc and 1-L PEG-Asc with bisacodyl (10 mg) formulation for quality of bowel cleansing while preparing for colonoscopy and patient compliance.

**Results:** One hundred patients received either 2-L PEG-Asc or 1-L PEG-Asc with bisacodyl. Regarding colon cleansing outcome (BBPS and APS), the 1-L PEG-Asc with bisacodyl group showed similar, but non-inferior results compared to the 2-L PEG-Asc group on both BBPS (6.92 ± 1.63 vs. 6.57 ± 1.37, p = 0.103) and APS (96% vs. 95%, p = 1.000) scales. Tolerability was similar for both 1-L PEG-Asc with bisacodyl and 2-L PEG-Asc.

**Conclusions:** Our study shows the 1-L PEG-Asc plus bisacodyl preparation has comparable tolerability and results in adequate colon cleansing. Bowel preparation with bisacodyl and 1-L PEG-Asc is a suitable alternative to low volume bowel preparation for colonoscopy.

**Keywords:** Ascorbic acid, Bisacodyl, Bowel preparation, Polyethylene glycol.
Results: Both groups were statistically similar regarding age, gender, body mass index (BMI), American society of anesthesiologists (ASA) score, tumor location and preoperative serum carcinoembryonic antigen (CEA) level. There was no statistical difference in operative findings except that mean operative time was higher in the LR group. Conversion from LR to OR was 3/21. There was no difference in postoperative complications or mortality rate. The rate of wound infection, ileus, and incisional hernia were higher in OR group but did not reach statistical significance. Resumption of analgesics were significantly lower in the LR group. The number of harvested lymph nodes and resection margins showed no statistical difference in both groups.

Aim of the Work: We will discuss three difficult cases we had complications with them: 1. First case was left ureteric injury lead to conversion to open surgery and uretro-vesical implantation was done. 2. 2nd case was difficult inferior mesenteric artery (IMA) artery exposure due to excess mesenteric fat controlled and managed laparoscopically. 3. Difficult splenic flexure mobilization and how we can deal with it.

Keywords: Colorectal, Complications, Laparoscopic.

PP1-059
Experience of Fast Track Sugery in Laparoscopic Radical Resection of Colorectal Cancer
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Objective: To study the feasibility and therapeutic effect of laparoscopic treatment combined with concept of fast track surgery for patients with colorectal cancer.

Methods: During the period of 2014.09–2015.12, 154 patients with non-obstructive colorectal cancer in our center were randomly grouped into three groups, respectively of open surgery + traditional perioperative therapy group, laparoscopic surgery + traditional perioperative therapy group, laparoscopic surgery + fast track surgery group. Three groups were compared in respect of postoperative anal exhaust time, postoperative defecation time, postoperative ambulation time, postoperative hospital stay, postoperative nutritional recovery (lymphocyte, serum total protein, albumin, prealbumin), postoperative inflammatory reaction (white blood cell count, body temperature), postoperative complications (intestinal obstruction, intestinal fistula, pulmonary infection, gastric retention, urinary retention, wound infection and other complications), analyzed with SPSS13.0 software, P < 0.05 showed there was significance.

Results: Compared with the first group, the second group had no significant improvement in terms of early postoperative nutritional status, postoperative stress response, postoperative recovery, but when the third groups were compared with the other groups, there were significantly improved.

Conclusion: With regard to the patients with non-obstructive colorectal cancer, the combination of laparoscopic radical surgery and the concept of fast track surgery is effective, and compared with the traditional treatment the postoperative rehabilitation can be significantly improved, thus this method has advantages and is worthy to be popularized.

Keywords: Fast track surgery, Colorectal cancer, Laparoscopy.

PP1-060
Perianal Paget’s Disease: Is It a Primary or Secondary Disease
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Background/Aim: First discovered by Sir James Paget in 1874 as a breast lesion, perianal Paget’s disease is exceedingly rare. It is important to distinguish true Paget’s disease (a primary lesion) from pagetoid spread of signet ring cells from a nearby adenocarcinoma (a secondary lesion).

Method: We present a case of perianal Paget’s disease (oncologically stage IIIb) that occurred 4 years after an anterior resection of rectal carcinoma for which the patient later underwent an abdomino-perineal resection. We questioned whether this was a slow
anorectal tumour shows intraepitheloid pagetoid cells. The clinical findings of perianal Paget’s disease, and vice-versa if the disease or as a secondary to an underlying adenocarcinoma as in Weledji’s disease with an associated malignancy but with discordant immunoprofile. Our patient is of the type 2 group, as the perianal Paget’s is associated with local recurrence of rectal cancer, same immunoprofile, and histological evidence of intraepithelial spread.

Conclusions: Perianal Paget’s disease may present as a primary disease or as a secondary to an underlying adenocarcinoma as in this case. Clinicians and pathologists should carefully examine the perianal epidermis in anorectal carcinoma, even if there are no clinical findings of perianal Paget’s disease, and vice-versa if the anorectal tumour shows intraepithelial pagetoid cells.

Keywords: Perineum, Paget’s, Treatment.

PP1-062
Metachronous Rectal Metastasis from Gastric Adenocarcinoma
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Introduction: Gastric carcinoma is the second cause of cancer death worldwide. Advanced stages of the disease may result in metastasis to many other organs, most commonly the liver, lung, bone, adrenal glands, and lymph nodes. However, colonic metastasis from gastric cancer is uncommon. We describe a case of a signet ring cell carcinoma of the stomach metastasizing to the recto-sigmoid colon which developed 4 years after a total gastrectomy for poorly differentiated gastric adenocarcinoma.

Case Report: An 57-year-old male patient was admitted to the Department of General Surgery with the symptoms of bowel habit change from 4 months ago. The patient had previously undergone a curative total gastrectomy 4 years ago for AGC Borrmann type 4, signet-ring cell carcinoma. The stage was T3N0M0 and the patient received an adjuvant chemotherapy with UFT for 2 years. Regular check up by abdominopelvic CT and esophagogastroduodenoscopy (EGD) showed no evidence of local or metastatic disease relapse. But thickening of rectosigmoid colon wall with luminal stenosis was noticed. Colonoscopy was performed and from 20 cm to the anal verge, luminal narrowing and hyperemic erythematous mucosal thickening was noticed. The biopsy specimens from colon showed a poorly-differentiated adenocarcinoma with signet ring cells. Cytokeratin 7 (CK7) and carcinoembryonic antigen (CEA) were found to be positive. But, Cytokeratin 20 (CK20) and CDX-2 were negative in the immunohistochemical staining. Thus, the actual colonic lesions were corresponding with the mucosal spread of the primary gastric carcinoma. There was no amplification in C-erb B2 (Her 2-neu) gene with FISH method. Chemotherapy consisting of FOLFOX was administered once in two weeks.

Conclusion: The colon is very rare metastatic localization. We report a case of colonic metastases from gastric adenocarcinoma whose clinical presentation was suggestive of a de novo adenocarcinoma of the recto-sigmoid colon.

Keywords: Gastric cancer, Rectal metastasis.
PP1-063
Laparoscopic Assisted Transanal Total Mesorectal Excision for Distal Rectal Cancer: Short Term Results from a Local Hospital in Hong Kong
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Background: Low rectal tumour in deep narrow pelvis is challenging even to experienced colorectal surgeons. The curvature of the bony pelvis increased the operative difficulty of transabdominal pelvic dissection due to suboptimal view and ineffective retraction. Transanal total mesorectal excision appears to provide a new way to tackle this old problem. It allowed a more direct access to the distal rectum so that a complete TME with tumour free circumferential margin could be achieved for oncological clearance. In addition, a more precise distal margin could be obtained for ultralow rectal tumours. We reported our experiences on laparoscopic assisted transanal TME for patients with distal rectal tumour.

Methods: Between 2014 and 2016, 23 patients were selected to undergo laparoscopic assisted transanal TME for malignant distal rectal tumour. Operations were started with circumferential incision on low rectum with a distal margin of >2 cm. Rectal dissection was performed using normal laparoscopic instruments. High ligation of inferior mesenteric artery and full splenic flexure mobilization were completed by laparoscopic route. Full rectum mobilization was completed after both dissections joined at peritoneal reflection. Specimen was delivered transanally or transabdominally depending on tumour bulkiness.

Results: The mean distance of tumour from anal verge was 5.1 cm. 95% of patients had clear circumferential and distal resection margins with intact mesorectum. The mean operative time was 435 minutes and blood loss was 290 ml. The mean number of lymph node harvested was 12. No patient had major complication requiring second operation.

Conclusion: Transanal TME is a feasible and safe alternative for patients with distal rectal tumour. It had special advantages for patients with ultralow rectal tumour and anatomical constraints.

PP1-064
Risk Factors Associated with Residual Disease at Colectomy Following Macroscopic Complete Endoscopic Resection of Early Colorectal Cancer
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Background and Aim: Subsequent colectomy is selectively needed to ensure complete removal of residual disease, which is residual tumor in colorectal wall or locoregional lymph node metastasis, following endoscopic resection of early colorectal cancer. This study aimed to determine the risk factors associated with residual disease at colectomy following endoscopic resection of early colorectal cancer.

Materials and Methods: Consecutive patients who underwent subsequent colectomy following macroscopic complete endoscopic resection of early colorectal cancer from January 2011 to December 2014 were identified from database. Clinicopathologic risk factors related to residual disease at colectomy after complete endoscopic resection were analyzed. This research has been approved by the Institutional Review Board at Kyungpook national university medical center.

Results: Colectomy following endoscopic resection was performed in 148 patients. Residual disease after colectomy was noted in 16 (10.9%) of 148 patients. Of these, residual tumor in the colorectal wall was diagnosed in 6 (4.1%) and locoregional lymph node metastasis was diagnosed in 10 (6.8%). Vertical positive (less than 1 mm) or unknown resection margin was associated with residual tumor in the colorectal wall (p = 0.011). Lateral positive or unknown margin was also associated with residual tumor in the wall (p = 0.001). Lymph node metastasis was associated with poor differentiation (p = 0.007) or the presence of lymphovascular invasion (p = 0.030). However, submucosal invasion depth did not differ significantly between the cohorts of patients with or without lymph node metastasis at colectomy (p = 0.168).

Conclusions: After macroscopic complete endoscopic resection of early colorectal cancer, subsequent colectomy should be considered in cases with positive (less than 1 mm) or unknown resection margin, poorly differentiated histology, or the presence of lymphovascular invasion.

Keywords: Early colorectal cancer, Endoscopic resection, residual disease, Colectomy.

PP1-065
Role of Laparoscopic High Ligation of the Inferior Mesenteric Artery in Staging of Left-Sided Colonic and Rectal Cancer
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Background: To investigate whether laparoscopic high ligation of the inferior mesenteric artery (IMA) can alter the staging of left-sided colonic and rectal cancer, which may offer oncological benefits.

Methods: This is a prospective study. All patients with left-sided colonic or rectal cancer without distant metastasis undergoing elective surgery with laparoscopic high ligation of IMA were studied from March 2015 to April 2016. The vascular pedicle including the lymphatic tissue from the proximal cut end of IMA to 1 cm distal to branch-off of left colic artery was divided from the main specimen and labelled as ‘apical lymph nodes’ (ALN). The disease was staged twice with and without the ALN. Thus, the impact of high ligation on staging can be studied.

Results: Fifty-one patients were included. The site of primary tumor were rectum (n = 26), rectosigmoid (n = 4) and sigmoid colon (n = 21). Seven patients with rectal cancer underwent neoadjuvant chemoradiotherapy. The types of resection were low an-
terior resection (n = 24), anterior resection (n = 25), sigmoidectomy (n = 2).

The pathological staging without ALN were Dukes’ A = 15 (T1N0 = 6; T2N0 = 9) B = 18 (T3N0 = 17; T4N0=1), and C = 18 (TxN1 = 13; TxN2 = 5). Lymph nodes were identified in 70.6% (n = 36) of the ALN specimens, containing 1 to 7 lymph nodes. None of the ALN specimen contained metastatic lymph nodes and the disease staging was not altered. Thus, the treatment plan remained the same.

Conclusion: Laparoscopic high ligation of IMA had no impact on staging of left-sided colonic and rectal cancer.

PP1-066
Macroscopic Diagnosis of Lymph Node Metastasis by Size and Palpation in Colorectal Cancer
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Background: During colorectal cancer surgery, surgeons sometime encounter a situation where they need to judge whether a lymph node at the surgical site is metastatic. However, there have been no studies evaluating macroscopic diagnosis of lymph node metastasis for an individual lymph node.

Purpose: The purpose of this study was to evaluate macroscopic examination for lymph node metastasis of colorectal cancer in a node-by-node analysis.

Methods: This study enrolled 408 patients who underwent curative resection for primary colorectal cancer at our department in 2014. Each manually dissected lymph node was measured in diameter and examined to determine whether it was metastatic based on its consistency by palpation. Macroscopic diagnosis of the lymph node was compared with the pathological diagnosis for each individual lymph node. Sensitivities, specificities, positive predictive values, negative predictive values, and accuracies were calculated for macroscopic diagnosis of lymph node metastasis in a node-by-node analysis, according to lymph node size.

Results: Of the 13,750 dissected lymph nodes, 444 lymph nodes (3.2%) were metastatic. For the lymph nodes overall, macroscopic diagnosis of lymph node metastasis revealed node-by-node sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of 50%, 98%, 52%, 98%, and 97%, respectively. The sensitivity for lymph nodes smaller than 3 mm and for lymph nodes larger than 15 mm was 2.8% and 90%, respectively.

Conclusions: The sensitivity of macroscopic diagnosis of lymph node metastasis in colorectal cancer was 50% in a node-by-node analysis, and the sensitivity decreased as lymph nodes became smaller.

Keywords: Colorectal cancer, Lymph node, Macroscopic diagnosis, Palpation, Size.

PP1-068
Liver Resection for Hepatocellular Carcinoma in Non-Cirrhotic Liver: Clinical Features and Long-Term Result
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Purpose: Of hepatocellular carcinomas (HCC), 15–20% occur in the non-cirrhotic liver. We conducted this study to review clinical features and result of liver resection for HCC in non-cirrhotic liver.

Methods: We conducted retrospective study to review all patients with HCC in non-cirrhotic liver patients underwent liver resection in our center from January 2008 to December 2013. Cri-
Background: The dose-response relationship in yttrium-90 (Y90) radioembolization for hepatocellular carcinoma (HCC) has been poorly described. Current practice aims to deliver >120Gy of radiation to tumor tissue – patients unable to tolerate >120Gy due to excessive lung shunting or poor tumor-to-normal-tissue ratio are often excluded. However, good response has been observed at lower doses, suggesting more patients may potentially benefit from Y90 radioembolization. Additionally, highest doses did not always produce the best response, suggesting presence of a plateau effect. This study aims to describe the dose-response relationship and identify minimum effective and optimum dose thresholds. This will be done using CT volumetry, which can accurately assess tumor response and provide a precise continuum for dose-response analysis.

Methods: This is a retrospective cohort study. HCC patients treated at Singapore General Hospital and National Cancer Centre Singapore between July 2011 and April 2016, and subjects from agreeable AHCC06 trial sites were identified. Those with available Partition Model dosimetry data and CT scans of appropriate time points were included. Target sample size is 100. Volumetry was performed by manual segmentation using OsiriX®. All measurements were performed by a trained observer and reviewed by an experienced oncologic radiologist. The predicted tumor-absorbed dose derived using Partition Model dosimetry was analyzed. Both simple linear and non-linear regression models were used to analyze the dose-response relationship and identify minimum effective and optimum dose thresholds.

Results: Preliminary results from the first 20 patients showed a positive dose-response relationship with identifiable optimum dose, beyond which response began to decline. Out of 9 tumors receiving <120Gy, 8 showed at least stable disease and 5 showed reduction in volume at 3 months. There was no observable minimum effective dose.

Conclusions: Chronic HBV was the main underlying liver disease of HCC in non-cirrhotic liver. Liver resection is definitive treatment which gives patients good long-term survival.

Keywords: Hepatocellular carcinoma, Hepatectomy, Noncirrhotic liver.

PP1-069 Volumetric Dose-Response Assessment in Hepatocellular Carcinoma Treated with Yttrium-90 Radioembolization Mingzhe Cai1, Tiffany Hennedige3, Choon Hua Thng3, James Khoo3, Butch Magsonbal3, David Ng4, Foong Koon Cheah5, John Allen6, Pierce Chow7

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Pathological Complete Remission with Long Term Survival after Hepatic Arterial Chemotherapy in Advanced Hepatocellular Carcinoma with Main Portal Vein Thrombosis

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Background: The prognosis of advanced hepatocellular carcinoma (HCC) patients with portal vein thrombosis is very poor even after surgery.

Aim: We report a case of pathologically confirmed complete remission of HCC induced by hepatic arterial infusion chemotherapy (HAIC).

Methods: A 45-year-old male patient had a massive HCC in the right and main portal veins. He achieved a partial response after two cycles of HAIC with 5-fluorouracil (750 mg/m²) and cisplatin (25 mg/m²).

Results: After completion of six cycles he received a curative partial hepatectomy, and histopathology revealed complete necrosis without any viable tumor cell. He has been in good health without recurrence at 40-month follow-up.

Conclusion: This result suggests that this regimen is a promising therapeutic modality for the treatment of advanced HCC with portal vein tumor thrombosis.

Keywords: Hepatocellular carcinoma, Neoadjuvant hepatic arterial infusion chemotherapy.

Liver Fibrosis Influences on Prognosis after Surgical Resection for Single Hepatocellular Carcinoma <5 cm in Patients with Child-Turcotte-Pugh A Cirrhosis

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Background and Aims: Surgical resection is recommended for single hepatocellular carcinoma (HCC) those who have well-preserved liver function, however, ones with severe liver fibrosis had poor clinical outcomes related with postoperative mortality and morbidity, and HCC recurrence. Therefore, we investigated the influence of liver fibrosis on prognosis after surgical resection and identified preoperative predictors.

Methods: A total of 189 patients with Child-Turcotte-Pugh A cirrhosis who underwent curative surgical resection for single HCC <5 cm from January 2005 to December 2014 were evaluated. Patients were assigned based on the degree of fibrosis (mild and severe liver fibrosis), determined by histological evaluation of the extracted liver specimens. Postoperative outcomes, and recurrence-free and overall survival were compared between the patients, and preoperative predictors for severe liver fibrosis were identified.

Results: Patients with severe liver fibrosis had more postoperative liver insufficiency (P = 0.000), and hospital stay (P = 0.029) and HCC recurrence compared with mild liver fibrosis (P = 0.016). Severe liver fibrosis (HR 1.849, 95% CI 1.191–2.869; p = 0.006), microvascular invasion (HR 1.854, 95% CI 1.183–2.906; p = 0.007), and poor histologic grade (HR 2.097, 95% CI 1.230–3.574; p = 0.007) were related to HCC recurrence. Platelet <140 (HR 2.544, 95% CI 0.713–9.071; p = 0.012) and ICG >20 (HR 30.149, 95% CI 8.574–106.015; p = 0.000) predicts severe liver fibrosis preoperatively.

Conclusions: Even in patients with well-preserved liver function, platelet count and ICG clearance test are a useful predictor for severe liver fibrosis, which predicts poor prognosis. Therefore, it should be considered before surgical resection.
Expression and Prognostic Role of FHIT, Fibronectin and PTEN in Hepatocellular Carcinoma

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Backgrounds: Fragile histidine triad (FHIT), Fibronectin and Phosphatase and Tensin Homology Deleted on Chromosome Ten (PTEN) are widely reported having abnormal expression in malignant tumors. The role of FHIT, Fibronectin, PTEN expression in patients with hepatocellular carcinoma (HCC) has not been characterized. Our study is aimed to investigate the expression of FHIT, Fibronectin and PTEN in human HCC and their relationship with clinicopathological features and prognosis of HCC.

Methods: Immunohistochemistry was used to detect expression of FHIT, FN and PTEN in tumor tissues from 138 HCC patients. The correlation between their expression and clinicopathological features and prognosis was analyzed.

Results: FHIT, Fibronectin, PTEN proteins have different expression between HCC and adjacent nontumor tissue ($\chi^2 = 5.968, 7.380, 4.962; p < 0.05$), which expressed differently in the groups of different tumor stage, grade, tumor size, tumor number, lymph node metastases, HBV infection and cirrhosis in the background of nontumor sections ($p < 0.05$). In FHIT and Fibronectin express positive group, the cumulative survival time were shorter than those in negative expression groups ($\chi^2 = 4.443, 9.867; p < 0.05$), which in PTEN express positive group was longer than those in negative expression group ($\chi^2 = 4.199; p < 0.05$).

Conclusions: FHIT, Fibronectin, PTEN were abnormally expressed in HCC cells, which have stimulative or suppressive effect to HCC carcinogenesis and progression. FHIT and Fibronectin can be used as negative makers for prognosis and PTEN as a positive one.

Keywords: Fragile Histidine Triad (FHIT), Fibronectin, Phosphatase and tensin homology deleted on chromosome ten (PTEN), Hepatocellular Carcinoma (HCC).

An Innovative Method in the Third Porta Hepatis Dissection during Laparoscopic Hepatotomy

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Background: Ligating short hepatic vein by titanium or Hem-o-lok clips often takes much time during the laparoscopic third porta hepatitis (THP) dissection. And its potential intraoperative bleeding risk can’t be ignored. A new method should be introduced into this complex surgical procedure.

Methods and Patients: The study was performed on patients who underwent laparoscopic hepatectomy (LH) from January 2014 to January 2015 in our institution. The LigaSure method was performed in recent 25 patients during their THP dissection. They were matched and compared to 25 patients who underwent a traditional method previously. Demographics, surgical procedure and complications were recorded and evaluated.

Results: Patients were well matched for several demographic factors. There was no significant difference in age, sex, etiology, BMI, ASA score, and Child-Pugh classification between groups. Using LigaSure during THP dissection was time saving compared to the traditional method ($9.7 \pm 2.8$ vs. $26.2 \pm 7.2$, $p < 0.000$). Although there was no significant different in complication comparison ($p = 0.211$), 2 patients in the traditional group suffered intraoperative bleeding caused by titanium clips dropping due to repeatedly manipulating for TPH. There was no postoperative bleeding from the TPH in both groups.

Conclusion: This study shows the feasibility of using LigaSure during laparoscopic TPH dissection. Compared to the traditional method, it is time saving and may decrease the potential intraoperative bleeding risk during this complex surgical procedure.

Keywords: LigaSure, Laparoscopy, Third porta hepatis.

Transplantation of the Hepatocytes, (Hepatocytes Progenitor Cell) Serum and Liver-Cell Toxic Injury

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Backgrounds/Aims: Carbon tetrachloride is a widely used model to study mechanisms of hepatic injury it causes hepatocyte injury that is characterized by centrilobular necrosis, the molecular mechanisms of injury is partially understood.

Methodology: 100 white Wister line rats were selected as experimental animals. They were divided into the 3 groups. The animals of I group (n = 20) have been used for modeling of acute liver failure by injection hepatocytotoxici agent CCL4 ‘carbon tetrachloride’. In animals of II group (n = 40) animals served as hepatocyte donors (progenitor hepatocytes) for serum. III group (n = 40) animals were used as control group. On the third day after liver toxic damage was starting treatment by serum which was made from progenitor hepatocytes that were on reparative regeneration activity, was injected and transplanted into abdominal cavity. Quantitative analysis of collagen in Sirius Red-stained liver sections was performed by morphometric analysis.

Results: The performed research has shown that our method promotes reparative regeneration in toxicallyinjured liver, and helps in organ function restoration. Micro morphological studies have shown structure and function restoration in hepatocytes organelles (mitochondria and endoplasmic reticulum), normalization of morphological and biochemical measurements.

Conclusions: By analysis of our results we can postulate that treatment of acute liver failure with our method (isolated hepatocyte transplantation and serum) induce and stimulates reparative

Abstracts
regeneration process in toxiclly damaged liver and it can be effec-
tive treatment method.

**Keywords:** Progenitor, Transplantation, Liver.

**PP1-077**

**Albenza-Induced Granulomatous Hepatitis: A Case Report**

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**Backgrounds:** Drug-related hepatotoxicity is a common med-
ical problem with implications for health systems. It constitutes a
cause of acute liver failure and, in many cases, is responsible for the
rejection of new pharmacological agents during efficacy and safety
studies. Risk factors, as well as pathogenesis of drug-induced liver
injury, are poorly understood. The diagnosis of drug-induced liver
injury is challenging; it is difficult to define the cause of drug hep-
atotoxicity due to the heterogeneity of the clinical presentation and
the absence of established criteria for accurate and reproducible
identification of drug-associated liver toxicity.

**Case Presentation:** We report the case of a 35-year-old cauca-
sian woman admitted to our Unit with symptoms of acute hepato-
tis of unknown etiology. She was diagnosed with albenza-induced
granulomatous hepatitis after ruling out other possible causes,
based on laboratory studies, liver biopsy, medical history, detailed
drug history, and spontaneous improvement of her liver biochem-
ical profile after medication withdrawal. This diagnosis was sup-
ported by the Council for International Organizations of Medical
Sciences-RousselUclaf Causality Assessment Method, which
showed a likely correlation between hepatocellular damage and
drug toxicity as the etiology.

**Conclusions:** Our patient’s suspected diagnosis was albenza-
induced granulomatous hepatitis with confirmatory histologic pattern. This case deserves particular attention due to the wide use of albenza in agricultural regions and the prevalent medical issue of drug-related hepatotoxicity.

**Keywords:** Albenza, Hepatitis.

**PP1-078**

**Liver Isolated Hepatocytes Transplantation, with Usage of Hemosorbtion Methods and Their Role during Acute Hepatic Insufficiency**

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**Backgrounds/Aims:** According to current experimental and
clinical data the principles of treatment of liver toxic illness: liqui-
dation of etiological factor; retention of the organism metabolism
on such necessary level which provides the organ function recov-
ery and stimulation of reparative regeneration processes in the tox-
ically damaged liver. Complex method of treatment which unites

hemosorbtion and cellular transplantation on one side will provide
metabolism and hemodinamics timely recovery, and on the other
hand stimulation of the separation regeneration of the damaged
organ.

**Methodology:** In the experiment studies was conducted with
usage of with 120 Wister Line white lab. rats with weight 170–200
g. The animals were divided in four groups. The animals of the first
group after creation of the model of acute liver damage was under
examination without treatment. The animals of II group after
three days of modeling was made one-time hemosorbtion. In III
group animals after three days of modeling performed transplanta-
ion of allogenic hepatocytes, IV group animals the conditions of
ethylene-ester mask narcosis as well as II group animals were made
one time hemosorbtion. Furthermore as well as in III group ani-
mals was conducted transplantation of allogenic liver isolated he-
patocytes.

**Results/Conclusion:** After modeling liver acute insuficincy on
3–7 day all animals of the control group died, with transplantation
method died – 70%; with detoxication treatment method died –
26%. And combined method of liver isolated hepahocytes and with
performing hemosorbtion methods died – 20%. The main reason
of death was acute liver insufficiency which was caused by liver
damage by toxic agent.

**Keywords:** Hepatocyte, Transplantation, Inicificency.
Portal Cavernoma in a Non Cirrhotic Young Female: A Case Report

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Introduction: Cavernous transformation of the portal vein (CTPV) is a rare entity and usually is a sequela of extra hepatic portal vein obstruction. The diagnosis of CTPV is very infrequent (CTPV) is a rare entity and usually is a sequela of extra hepatic portal vein obstruction. The diagnosis of CTPV is very infrequent-

Methods: Sprague-Dawley rats aged seven weeks were injected intraperitoneally with 50% CCl4 in olive oil. Berberine was orally administered before or after CCl4 treatment in various groups. Twenty-four hours after CCl4 injection, serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activities, serum and liver superoxide dismutase (SOD) levels, the histology in tetrachloride (CCl4)-induced liver injury.

Results: Serum ALT and AST activities significantly decreased in a dose-dependent manner in both pre-treatment and post-treatment groups with berberine. Berberine increased the SOD activity in liver. Histological examination showed lowered liver damage in berberine-treated groups.

Conclusion: The present study demonstrates that berberine possesses hepatoprotective effects against CCl4-induced hepatotoxicity and that the effects are both preventive and curative. Berberine should have potential for developing a new drug to treat liver toxicity.

Keywords: Carbon tetrachloride, Hepatotoxicity, Liver.


d ed episodes of hematemesis prompted gastroscopy with ligation of grade 2 esophageal varices. On physical examination there was no hepatomegaly however she had splenomegaly measured at 22 x 23 cm. CBC revealed biceopenia, microcytic, hypochromic anemia with adequate platelets. Liver function tests were unremarkable. HBsAg and anti-HCV screening were negative. Fibroscan of the liver revealed intermediate fibrosis. Abdominal MRI ant CT scan revealed portal cavernoma and absence of cirrhosis with focal biliary ectasia and cholecystolithiasis. Repeat gastroscopy revealed 2 columns of large varices. Anemia was corrected and patient maintained on Propanolol 10 mg/tab TID. Prophylactic endoscopy was advised every 3 months. Currently she is being counselled for contemplated splenectomy.

Discussion: Most cases of portal hypertension follow chronic liver disease while non cirrhotic causes are occasionally seen. Cavernous Transformation of the Portal Vein is a rare and incurable complication of portal vein thrombosis.


d in liver. Histological examination showed lowered liver damage in berberine-treated groups.

Conclusion: The present study demonstrates that berberine possesses hepatoprotective effects against CCl4-induced hepatotoxicity and that the effects are both preventive and curative. Berberine should have potential for developing a new drug to treat liver toxicity.

Keywords: Carbon tetrachloride, Hepatotoxicity, Liver.
**PP1-083**

**Distribution of Liver Lesions in Asymptomatic Patients: A Prospective Autopsy Study**

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**Introduction:** Liver disease is very common in our environment. Some of our patient with chronic liver diseases present at a very late stage where treatment is essentially unhelpful. The aetiology of liver disease in Kumasi include hepatitis B and C viruses, alcohol, drugs and so on. Our study aims to describe the various lesions of the liver in patients who died from other causes.

**Methodology:** Liver from 100 consecutive autopsies at the Komfo Anokye Teaching Hospital over a year were reviewed. The data regarding age, sex and cause of death were recorded. Each liver biopsy stained with H&E, Mason Trichrome, PAS, Perl’s, and reticulin were examined for liver lesions.

**Result:** Our patients were in the age range of 10–79 years with modal age in the 5th decade of life. There were 62 males and 38 females with M:F ratio of 1.6:1. The causes of death were road traffic accident (62%), sudden natural (36%) and homicide (2%). The liver lesions seen include steatohapatitis (54%), steatosis (24%), HBV (4%), HCV (4%); and acute hepatic congestion, drug induced hepatitis, iron overload, liver abscess, and hepatocellular carcinoma constituted 2% each. Only 4 cases were normal. There were varying degrees of steatosis across lesions. Three cases with stage 4 fibrosis were associated with cancer and steatohepatitis.

**Conclusion:** This study showed that a number of lesions in the liver could be asymptomatic and therefore the need to have periodic screening for those above the age of 40 years in our population.

**Keywords:** Autopsy, Prospective, Liver, special stains, Staging fibrosis.

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**PP1-084**

**Impaired Liver Function Attenuates Liver Regeneration and Hypertrophy after Portal Vein Embolization**

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**Aim:** To clarify the relationship between preoperative clinical factors and regenerative capacity of the remnant liver after hepatectomy, and the relationship between the regeneration rate after hepatectomy and hypertrophic rate after portal vein embolization.

**Methods:** The subject were 63 patients who underwent major hepatectomy, and 13 patients who undergone portal vein embolization in the Division of Gastroenterological Surgery, Saitama Cancer Center, between January 2012 and August 2015. We examined the relationships between clinical parameters and regeneration rate after major hepatectomy, and the relationships between regeneration rate after hepatectomy and changes in the volume of nonembolized liver after PVE in each people, retrospectively.

**Results:** The remnant liver volume/total liver volume ratio correlated negatively with the regeneration rate after hepatectomy ($p = -0.850, p < 0.001$). Regeneration rate was significantly lower in patients with indocyanine green retention rate at 15 min $\geq 20%$ in the right hepatectomy group, not in the left hepatectomy group. The hypertrophic rate was correlated positively with the regeneration rate after hepatectomy in the each patient ($p = 0.648, p = 0.017$). In the group of PVE, hypertrophic rate was significantly lower in patients with ICG-R15 $\geq 20%$, and total bilirubin $\geq 1.5$ mg/dl.

**Conclusions:** Regeneration rate after major hepatectomy correlated with remnant liver volume and hypertrophic rate after PVE. Both regeneration rate after major hepatectomy and hypertrophic rate after PVE were lower in the presence of liver function failure.

**Keywords:** Regeneration after hepatectomy, Major hepatectomy, Clinical factors, Portal vein embolization, Hypertrophy.
Conclusion: ALPPS can be a useful option to improve resectability of huge and/or multiple liver tumor even in the cases with insufficient FLR after PVE.

Keywords: ALPPS.

PP1-086
Usefulness of Hepatic Arterial Infusion Therapy for Unresectable Liver Metastases from Colorectal Cancer
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Aims: To date, the efficacy of hepatic arterial infusion therapy for unresectable liver metastases from colorectal cancer has not been established. However, there are quite a few patients showing a marked response to hepatic arterial infusion therapy (HAI) combined with systemic chemotherapy. The objective of this study was to identify the efficacy of HAI performed in our hospital.

Methods: Of 122 advanced/recurrent colorectal cancer patients undergoing chemotherapy in our department for the past 7 years until 2015, 6 patients with unresectable liver metastases (4.9%) received HAI with 5-FU2 in an outpatient setting. The response rate, the number of survival days, adverse events, etc. in patients receiving HAI were examined retrospectively.

Results: The median survival time after recurrence in 122 patients receiving chemotherapy was 28 months. The survival time (outcome) for each of the 6 subjects in the HAI group was 45 months (dead), 52 months (dead), 28 months (dead), 127 months (alive), 125 months (dead) and 46 months (dead). The number of infusions ranged from 20 to 167 (total dose of 5-FU: about 180 g). The response rate resulted in 83.3%. On the other hand, adverse events associated with HAI were limited to abnormal drug distribution due to catheter-related problems in 2 patients, neutropenia of Grade 3 in 2 patients. Every three months, a request was made for the radiologists in related facilities to check the implanted reservoirs.

Conclusion: HAI offers treatment on an outpatient basis, and also allows escalation of dose-intensity, while reducing the risk of adverse events, thus enabling patients to maintain their quality of life. Moreover, HAI combined with systemic chemotherapy is expected to extend the prognosis. To continue arterial infusion therapy, it is important to collaborate with specialists who are familiar with interventional radiology procedures, including checking implanted reservoirs.

Keywords: Hepatic arterial infusion therapy, Unresectable liver metastases, Colorectal cancer.

PP1-087
Posterior Segments Liver Resection. Glove Port Assited with Intercostal Port
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Background: The catastrophic abdomen, as the result of multiple surgeries, is usually considered a contraindication to perform minimally invasive surgery. In those patients the difficulty of perform a laparoscopic liver resection increases markedly. We present an alternative to traditional surgery in those patients.

Method: A 77-year-old male with a liver metastases of neuroendocrine origin, in segment VII. The patient had underwent multiple laparotomies, for both elective and urgent procedures. The primary neuroendocrine tumor was located at the stomach. After a free period of more than one year. The magnetic resonance revealed a nodular lesion of 13 mm in diameter in the segment VII of the Liver, compatible with liver metastases. In the physical examination the patient had a middle laparotomy as well as a bilateral subcostal incision. Surgery began positioning the patient supine lateralized to the left side. The intercostal port was placed in the ninth intercostal space with the mid-axillary line. ‘Glove port’ was prepared using a latex surgical glove and located on the right subcostal laparotomy. The intraoperative ultrasonography shows the known lesion in segment VII, and a new lesion I segment 4b, both lesion was resected performing limited liver resections.

The surgery lasted 180 minutes.

Results: The patient had a favorable postoperative period and was discharged from hospital 48 hours later.

Conclusion: The use of ‘reduced port surgery’ for laparoscopic liver resection in patients with catastrophic abdomen is safe and feasible, allowing those patients to benefit od the advantages of minimally invasive surgery.

The use of ‘GLOVE PORT’ is less expensive than usual single ports. The intercostal ports improve the access to lesions located in the posterior segments of the liver. Therefore, we present an innovative method for use in cases of liver lesions in patients with posterior segments that otherwise would be treated by more aggressive techniques.

Keywords: Glove port, Intercostal port, Posterior segments.

PP1-088
Combined Approach for Laparoscopic Liver Resection Segment VII and Left Lateral Seccionectomy
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Background: We present the approach and laparoscopic resection of two liver metastases from colorectal carcinoma in segments II-III and VII.

Abstracts
Surgical complications.

To the grading system of Clavien for the consistent description of live liver donor and describe the surgical morbidity according to grading system, Laparoscopic approach.

Grade IV = complications causing organ dysfunction requiring ICU management; Grade V = complications resulting in death.

Results: They were 129 males (63.2%) & 75 females (36.8%) with the donor’s mean age was 27.72 ± 6.4 years with a range of 19–45 years. There were 64 donors (31.4%) who developed postoperative complications totally 74 complications. Ten donors (4.9%) had more than one complication. Twenty-nine (39.2%) donors had Clavien grade I complications, Thirty-eight donors (51.3%) had Clavien grade IIa, six (8.1%) donors had Clavien grade IIIb complications and there was one (1.4%) case of mortality (Clavien grade V).

Conclusions: Donor hepatectomy is a relatively safe procedure, when performed by a dedicated and well-trained team. A prompt diagnosis and meticulous intervention is considered a first priority whenever a donor complication expected. Furthermore, continuous standardized reporting and a comprehensive database to precisely define true donor morbidity.

**Utility of Clavien Gradient System in Living Liver Donor Hepatectomies**

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Background: Several large centers have reported outstanding outcomes of LDLT to decrease waiting list mortality. Although the ratio of complications differ widely, Moreover, there is still no consensus on how to define and stratify complications by severity.

Aim: Identify and analyze retrospectively the surgical outcome of live liver donor and describe the surgical morbidity according to the grading system of Clavien for the consistent description of surgical complications.

Materials and Methods: This study retrospectively analyzed the outcomes of 204 consecutive living donor hepatectomies performed between April 2003 to October 2013 using modified Clavien system: Grade I = minor complications; Grade II = potentially life-threatening complications requiring pharmacologic treatment; Grade III = complications requiring invasive treatment; Grade IV = complications causing organ dysfunction requiring ICU management; Grade V = complications resulting in death.

Results: The patient improved, was discharged from hospital 4th postoperative day. Pathological study showed total regression of metastases, Laparoscopic approach.

Grade IV = complications causing organ dysfunction requiring ICU management; Grade V = complications resulting in death.

Conclusions: Donor hepatectomy is a relatively safe procedure, when performed by a dedicated and well-trained team. A prompt diagnosis and meticulous intervention is considered a first priority whenever a donor complication expected. Furthermore, continuous standardized reporting and a comprehensive database to precisely define true donor morbidity.

**PP1-090**

Reconstruction of Isolated Inferior Right Hepatic Vein(s) in a Right Lobe Living Donor Liver Transplantation by Using Polytetrafluoroethylene Grafts – A New Feasible Concept, Technique of Venoplasty and Outcomes

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Background: Right lobe living donor liver transplantation (LDLT) remains most common form of liver transplantation Asia. However, reconstruction of the venous outflow in a right liver allograft may pose technical difficulties if hepatic venous variations are present. Recently, much emphasis has been given to the reconstruction of large and multiple inferior right hepatic veins (IRHVs). The method of reconstructive technique, type of vascular grafts and the outcome after such procedure has been a point of debate. In this report we aim to highlight the IRHV reconstruction techniques using expanded polytetrafluoroethylene (ePTFE) vascular grafts and the outcomes after such reconstruction.

Materials and Methods: Out of 262 of the right liver allografts that underwent venous reconstruction using ePTFE vascular grafts, IRHVs required either venoplasty or second inferior vena cava (IVC), anastomosis in 99 recipients. Depending upon type of IRHV reconstruction, the recipients were divided in 2 groups: Group A (n = 52): IRHV venoplasty using ePTFE graft. Group B (n = 47): Direct IRHV-to-IVC anastomosis. The outcome after LDLT was compared for these 2 groups.

Results: The ePTFE venoplasty group had significantly shorter warm ischemia time as compared to direct to IVC anastomosis group (p < 0.01, 95% confidence interval –10.96 to –2.92). There were no thrombotic complications in either of the group recipients. 4.2% of the recipients from group B developed hepatic venous stenosis but with no clinical deterioration. One patient from group...
A developed ePTFE graft migration in second portion of duodenum that required surgical exploration.

Conclusions: The IRHVs drain considerable portion of posterior sector of right liver allograft and hence, must be reconstructed. Use of ePTFE vascular grafts for IRHV venoplasty is a safe and feasible concept that facilitates the outflow reconstruction of liver allograft.

Keywords: Expanded polytetrafluoroethylene graft, Inferior right hepatic vein reconstruction, Bridging conduit plasty, Living donor liver transplantation, Outflow reconstruction.

PP1-091
Early Surgical Procedures Post Living Liver Donor Transplantation: Difficulties, Causes and Outcome

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Background: Different situations post Living Donor Liver Transplantation need early surgical intervention.

Methods: From April 2003 to April 2015, 240 patients had undergone LDLTx at the National Liver Institute, Menoufia University. Early surgical procedures in the first hospital stay in such patients were evaluated. Mortality was analyzed using Kaplan-Meier survival curve.

Results: Twenty five patients needed early surgical interventions in the first hospital stay after LDLTx. External biliary diversion and peritoneal lavage for biliary leak accounts for the major indication for early surgical intervention (9 patients (36%)). Followed by the vascular complications in the form of Hepatic artery thrombosis and portal vein thrombosis 7 patients (28%). Wound dehiscence, intestinal perforation, bleeding resulting from pigtail insertion for intra-abdominal collection drainage represent the other indications.

Conclusion: Rapid surgical intervention in such immunocompromised patients is important to achieve fair outcome. Postoperative anticoagulant therapy is one of the major obstacles in early surgical intervention.

PP1-092
Fetus in Fetu, A Case of Unborn Twin

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Backgrounds: Fetus in fetu, a pathologic condition represents an aberration of monozygotic diagnostically twinning in which unequal division of the totipotent inner cell mass of the developing blastocyst leads to the inclusion of a smaller cell mass within a maturing sister embryo. It is an extremely rare and fewer than 100 cases have been reported in the literature.

Case Report: A 15 years old boy was presented with progressive abdominal distension since infancy associated with abdominal pain for 1 week. On examination he had huge abdominal mass. Plain abdominal radiograph showed multiple parts of long bones and skull. Computed tomography of the abdomen revealed fetus-in-fetu with upper and lower limbs, brain, skull, teeth and vertebrae recognized. CT angiogram shows multiple small arterial supplying the wall. No main arterial pedicle detected. Surgical exploration of the mass done with intraoperative findings of 1000 cc pus aspirated from perforated part of gestational sac intraperitoneally, feeding vessels to the sac mainly from mesentery of small bowel near the jejunum. Gestational sac weighing 2.5 kg delivered, with 1.6 kg unviable baby inside, malformed upper and lower extremities, flipperlike feet and hypoplastic trunk associated with long hair, developed male genitalia with pubic hair, imperforated anus, underdeveloped eyes, vertebrae with normal baby skin covered with vernix caseosa. No mouth, no umbilical cord and no placenta. The unfortunate baby was then returned to the family as requested for ritual burial. The sac enveloping the fetus was sent for histopathological examination, noted fibrous cyst wall with focal area lining of mature squamous epithelium with many hair shafts and some muscle in subepithelial stroma.

Conclusion: Fetus in fetu is an extremely rare and interesting entity. Current imaging modalities may allow us to accurately diagnose the condition before surgery. Complete excision is curative and allows confirmation of the diagnosis.

Keywords: Fetus in fetu, Unborn twin, Extremely rare.

PP1-093
Real-Time Intraoperative Fluorescent Lymphography – A New Technique for Lymphatic Sparing Surgery

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Background: Many surgical procedures can produce persistent lymphorrea, lymphoceles and lymphedema after lymph nodes and lymph vessels damages. Appropriate visualization of the lymphatic system is challenging.

Objective: We aimed to develop a high spatial resolution real-time intra-operative imaging technique to avoid or early recognize deep lymphatic vessels damage.

Methods: We intraoperatively performed ICG fluorescence-guided lymphography during a kidney transplant. ICG was injected in the subcutaneous tissue of the patient’s groin in the Scarpa’s triangle. A dedicated laparoscopic high definition camera system was used.

Results: Soon after ICG injection, lymphatic vessels were identified in the abdominal retroperitoneal compartment as fluorescent linear structures running side by side to the iliac vessels. Surgical dissection was therefore conducted avoiding iatrogenic damages to major lymphatic structures. Another ICG injection at the end of the procedure confirmed that lymphatic vessels were intact without lymph spread.

Abstracts
Conclusions: Intra-operative lymphatic mapping with ICG fluorescence-sensitive camera system is a safe and feasible procedure. ICG real-time fluorescent lymphography can be used to avoid or early recognize deep lymphatic vessels damage and reduce post-operative complications related to lymphatic system.

Keywords: Lymphangiography, Kidney transplant.

PP1-094
Quantitative Assessment of the Association between FEN1 Polymorphisms and Cancer Risk
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Purpose: Previous studies have investigated the association between Flap endonuclease 1 (FEN1) –69G>A (rs174538) and 4150G>T (rs4246215) polymorphisms and cancer risk. However, the results were controversial. We therefore carried out a meta-analysis to derive a more precise estimation of the association.

Methods: PubMed, EMBASE and China National Knowledge Infrastructure (CNKI) databases were systematically searched to identify potentially eligible literatures. Crude odds ratios (ORs) and their 95% confidence intervals (CIs) were used to assess the strength of association between FEN1 –69G>A and 4150G>T polymorphisms and cancer risk.

Results: A total of 6 articles, including 5,715 cases and 6,986 controls, were used to evaluate the effect of the two polymorphisms on cancer risk. The pooled ORs indicated that FEN1 –69G>A and 4150G>T polymorphisms were significantly associated with cancer risk (For –69G>A polymorphism, A vs. G: OR = 0.72, 95% CI: 0.69–0.77, PH = 0.32; AA vs. GG: OR = 0.53, 95% CI: 0.47–0.59, PH = 0.41; AG vs. GG: OR = 0.76, 95% CI: 0.70–0.82, PH = 0.56; (AA+AG) vs. GG: OR = 0.69, 95% CI: 0.65–0.75, PH = 0.43; AA vs. (AG+GG): OR = 0.61, 95% CI: 0.55–0.68, PH = 0.58. For 4150G>T polymorphism, T vs. G: OR = 0.77, 95% CI: 0.71–0.83, PH = 0.02; TT vs. GG: OR = 0.59, 95% CI: 0.50–0.69, PH = 0.06; TG vs. GG: OR = 0.80, 95% CI: 0.74–0.86, PH = 0.14; (TT+TG) vs. GG: OR = 0.74, 95% CI: 0.66–0.82, PH = 0.05; TT vs. (TG+GG): OR = 0.68, 95% CI: 0.61–0.75, PH = 0.23). In stratified analyses by cancer type, significant associations were closely associated with cancer risk. Interestingly, significant correlation between FEN1 –69G>A polymorphism and mRNA expression was observed.

Conclusion: This meta-analysis suggests that FEN1 –69G>A and 4150G>T polymorphisms are associated with the risk of cancer, especially digestive system cancer, which will contribute to risk prediction and prevention of cancer.

Keywords: FEN1, Polymorphism, Cancer, Risk.

PP1-095
Bloodbath, Seeing Red Everywhere: A Rare Case of Multi-Organ Bleeding from Metastatic Choriocarcinoma
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Aim: Choriocarcinoma is the most aggressive form of gestational trophoblastic disease (GTD). It has rapid growth and metastatic potential. Most patients presented with bleeding manifestation in certain organs such as vaginal, gastrointestinal tract, lungs or brain. We report an unusual case of multiple organs bleeding in a patient with metastatic carcinoma.

Method: A young lady was admitted for lower abdominal pain and vomiting. Blood test showed raised beta HCG and low haemoglobin. Diagnostic laparoscopy revealed haemoperitoneum with bleeding left corpus luteum cyst. Histology returned as choriocarcinoma. Computed tomography (CT) scan of thorax, abdomen and pelvis showed multiple liver, kidneys and pulmonary nodules as well as spleen rupture. Emergency laparoscopic spleenectomy was performed.

Unfortunately, she had further dropped in blood pressure requiring noradrenaline support and massive blood transfusion. Decision made for exploratory laparotomy which revealed brisk bleeding from liver nodule.

Post operatively, she still had persistent hypotension and low haemoglobin levels despite aggressive blood transfusion. We decided for small bowel resection. We found 3 areas of tumour deposits along the small bowel. Her condition improved initially but she became unresponsive suddenly with anisocoric pupils and left sided hemiparesis. Urgent CT brain showed large intracranial bleed. She had an emergency left decompressive craniectomy and evacuation of intra-cerebral haemorrhage and insertion of intracranial pressure monitor.

Result: Unfortunately, her coagulopathy and bleeding worsened and she eventually succumbed to her disease.

Conclusion: Choriocarcinoma is very chemo-sensitive but extremely aggressive. Most patients do not survive due to bleeding complications.

Keywords: Choriocarcinoma, Bleeding, Metastasis.
PP1-096
Ischemic Complication Following Isolation of the Parent Artery for Postoperative Bleeding after Hepatopancreatobiliary Surgery

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Background/Aims: To evaluate the efficacy of parent artery isolation for postoperative bleeding following hepatopancreatobiliary surgery and the incidence of ischemic complications.

Method: Twenty-one patients, treated between December 2005 and December 2015, were included. Pancreatproxoduodenectomy, distal pancreatectomy, hepatectomy, or cholecystectomy was performed in 12, 2, 5, and 2 patients, respectively. Isolation of the proper or common hepatic artery was performed in all patients. Technical and clinical success rate, mortality rate, and adverse events were evaluated.

Result: Preceding embolization had been performed in 4 patients. Technical success was obtained in all cases and no rebleeding was observed. The mortality rate was 23.8%. Among 6 patients who died, 3 died of liver failure due to embolization. Major liver infarction, which required additional medical attention, was observed in 3 patients after hepatectomy, while it was not observed after pancreatoduodenectomy. Abscess formation was observed in 5 patients after pancreatoduodenectomy. Percutaneous drainage was required in 1 patient and conservative treatment was performed in the other 4 patients. Isolation of the parent artery was an effective treatment for postoperative bleeding.

Conclusion: Parent artery isolation is an effective treatment for postoperative bleeding after hepatopancreatobiliary surgery. The risk of major liver infarction is high after hepatectomy; therefore, the risk should be estimated by comprehensive workup of potential collateral pathways.

PP1-097
Symptomatic Anterior Abdominal Wall Schwannoma: A Case Report and Literature to Review

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Schwannoma (neurinoma or neurilemmoma) is a rare, benign tumor that arises from the nerve sheath. Schwannoma is the most common tumor of the nerves and the incidence in adults is ~5% (1). It usually involves the extremities, but can also found in the head, neck, trunk, pelvis, retroperitoneum, mediastium and gastrointestinal tract. It is usually asymptomatic and occasionally symptomatic due to compression of surrounding large nerves. To the best of our knowledge, only 4 reported case of schwannoma located in the abdominal wall and second reported symptomatic case.

Method: We are reporting a case of a 43 year old gentleman presented to our surgical outpatient clinic for right hypochondriac pain for 2 years. The pain worsens over the years and increasing swelling over the right hypochondriac region. Ultrasound and CT scan revealed a small solid tumor in the anterior abdominal wall adjacent to liver. Otherwise blood investigations and tumor markers were unremarkable.

Result: CT guided biopsy of the right internal oblique muscle was done. Pathologist reported microscopically, one strip of lesion composed of spindle shaped cells. There are cellular (Antoni A) areas. In the former, these cells are arranged in fascicles with occasional Verocay bodies seen. Several dilated vessels, some of which by hyalinisation of their wall are present. There is no nuclear atypia or mitosis. HPE reported as nerve sheath tumor, favoring Schwannoma. The lesion was removed using anterior surgical approach.

Conclusion: Histopathology revealed the tumor to be benign. The definitive treatment is surgical removal. The prognosis of these lesions is good, recurrence is unusual and malignant transformation is rare. A lesion located in the abdominal wall should be considered among the rare causes of unexplained abdominal pains.

Keywords: Schwannoma, Anterior abdominal wall, Benign tumor.
high risk of intestinal ischemia that leads to its perforation. Therefore careful evaluation of all of the findings is essential.

**Conclusion:** It is important to keep in mind that a large number of hemodialysis patients have diabetes and take oral α-GI and DPP-4 inhibitor that can cause PCI. We show a case of PCI occurred to a hemodialysis patient taking oral α-GI and DPP-4 inhibitor with some literal discussions.

**Keywords:** Pneumatosis cystoides intestinalis.

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**PP1-099**

**Osteopontin – New Biomarker for Gastrointestinal Cancers?**

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Osteopontin (OPN) transformation-related protein phosphatase, is expressed by various tumors (breast, lung, gastric, hepatic, colon and prostate) and is positive correlating with poor disease outcome. OPN play significant role in various signaling pathways (Akt, Raf/MEK/ERK, ILK/P13K/GSK-3β and RAN GTPase/c-Met/PI3 kinase) and is also participating in regulation of hypoxia-inducible factor-1α-dependent VEGF expression what is leading to tumor angiogenesis and growth.

The genes for OPN are routinely overexpressed in pancreatic ductal adenocarcinoma (PDA) and OPN is significantly elevated in PDA tissue. Elevated serum OPN level may be used as a promising diagnostic tool for early identification of PC.

Only one of the isoform of OPN, OPN-C mRNA is overexpressed in gastric cancer, and high levels of OPN are connected with increased proliferation, metastasis and bad prognosis. OPN promotes the progression of gastric cancer through the NF-κB pathway. OPN overexpression in gastric cancer is significantly associated with low apoptotic index, high proliferative index, low grade differentiation of tumor, as with lymphonodal and vascular invasion.

In HCC, there is elevated expression of serum OPN compared to patients with normal liver function or with liver cirrhosis and chronic hepatitis.

OPN is highly expressed in patients with metastatic hepatic lesions from colorectal cancer (CRC) and its level is significantly associated with poor survival rates. In CRC, OPN is connected with estrogen related receptor alfa (ERRα) suggesting a role of ERRα in the development and progression of CRC, promoting the possibility of targeting ERRα with antagonists as anticancer agents.

Multivariate analysis of study data promote OPN expression as an independent prognostic indicator of poor overall survival in patients with gastrointestinal cancers.

**Keywords:** Osteopontin, Gastrointestinal cancers, Biomarker.

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**PP1-100**

**Is It Possible to Prevent Tumors with Nutritive Supplements?**

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About 80% of the tumors are related to environmental factors, including what we eat, drink and breathe. Till now it was conducted over 60 studies related to cancer prevention and huge amounts of money has been spent but conclusive findings still have not been obtained.

In vitro, vitamins A, C, E, selenium, coenzyme Q10, N-acetylcysteine, glutathione reduce the damage caused by oxidative processes. Results of in vivo studies with nutritional supplements are often contradictory. In ‘Alpha Tocopherol Beta carotene Cancer Prevention Study’ alpha tocopherol 50 mg daily resulted in 41% reduction in mortality rate in prostate cancer. But giving beta carotene at a dose of 20 mg per day increased by 23% the incidence of prostate cancer in smokers.

Data from other study shows that increased fiber intake led to a 77% decrease in the risk of cardia cancer and increased antioxidant intake reduces the risk of esophageal squamous-cell carcinoma by 40% and adenocarcinoma by 50%. These results were not confirmed in other studies. The data regarding the role of vitamin D in preventing GI cancers are growing but still unconvincing. Currently any intervention with nutritional supplements are ineffective in invasive and extended (metastatic) cancer. Dietary interventions can be directed to the period before the tumor becomes invasive in patients in whom genetic testing has confirmed that they are in high risk group for cancer development.

Nutritional support in the reversion of tumor cachexia has exceptional importance in maintaining patient weight, muscle mass, quality of life, all of which leads to the possibility of long-term application of chemo/radio therapy and thus to longer survival.

**Keywords:** Nutrition, Cancer, Prevention.

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**PP1-101**

**Induction of Tolerogenic Dendritic Cells by Nasopharyngeal Carcinoma-Derived Exosomes**

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**Background:** A characteristic of the nasopharyngeal carcinoma (NPC) micro-environment is the presence of immunosuppressive exosomes released by tumor cells. Our team has recently shown that NPC-derived exosomes, which carry Galectine-9, favor the recruitment and suppressive activity of human regulatory T cells (Treg), thus contributing to NPC immune escape (Mirzak et al, JNCI, 2015). In this study, our objective is now to evaluate whether these NPC-derived exosomes could promote the emergence of tolerogenic immature dendritic cells (tolDC) able to in-
duc regulatory T cells from naïve CD4+ T cells ultimately contributing to the tolerance of tumor cells.

**Methods and Results:** We performed a complete phenotypical and functional study comparing the effect of NPC and healthy donor-derived exosomes on DC maturation. This study includes (i) cell morphological analysis by photonic microscopy, (ii) transcriptomic study by RTqPCR, (iii) flow cytometric analysis of the expression of specific markers (phenotypic DC and co-stimulatory markers), (iv) a preliminary DC functional study by western blotting (IDO) and finally (v) a secretome analysis by ELISA (IL-10; TGF-β, TNF-α). Taken together our results strongly suggest that the presence of NPC-derived exosomes favors the emergence of semi-mature DCs seemingly tolerogenic.

**Conclusion:** Despite the importance of immature DCs as mediators of cancer immune escape, no other studies have shown the impact of tumor exosomes on the maturation of human DCs. Thus, these promising results should open new prospects for anti-tumor immunotheberapies based on the inhibition of factors involved in the emergence and activation of Treg.

**Keywords:** Exosomes, Tolerogenic dendritic cells, Nasopharyngeal carcinoma.

**PP1-102**

**Iatrogenic Splenic Laceration from Cardiopulmonary Resuscitation – A Rare Complication**

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**Background:** Chest compressions during cardiopulmonary resuscitation have been shown to cause unintended injury to its receiver. The blunt trauma of chest compressions most frequently results in thoracic complications due to the direct application of force to said area. Intra-abdominal complications remain a rare but dangerous occurrence.

**Methods:** We present a rare case of an iatrogenic splenic laceration and its management in a patient who had received cardiopulmonary resuscitation prior, along with a brief review of the literature.

**Results:** A 69-year-old gentleman with ischaemic heart disease underwent an elective cardiac catheterization and coronary angioplasty. The procedure was complicated by a rupture of the left circumflex artery, pericardial tamponade and cardiogenic collapse. He received cardiopulmonary resuscitation and required extracorporeal membrane oxygenation, intra-arterial balloon pump insertion and a sternotomy for haemostasis. On post-operative day one, he presented with a tense abdomen with haemodynamic instability. Computed tomography of his abdomen revealed a significant amount of haemoperitoneum with no definite source identified. Emergency exploratory laparotomy was performed with intra-abdominal four quadrant packing. The bleeding source was identified to be a splenic laceration. Haemostasis was secured with capsule stitching and the use of topical haemostatic agents without requiring a splenectomy. There was no occurrence of re-bleed post operatively. A brief review of the literature revealed 12 documented cases of splenic injuries post cardiopulmonary resuscitation. Of these, 7 patients were successfully managed with a splenectomy and 1 with splenic artery embolization.

**Conclusion:** The importance of early detection of rare but life-threatening extra-thoracic complications of cardiopulmonary resuscitation is thus highlighted, and should be routinely considered in patients who have received chest compressions so as to allow for early intervention.

**Keywords:** Bronchogenic cyst, Retroperitoneal mass, Gallbladder polyp.
them were encountered during sessions of radiofrequency and microwave ablation for Hepatocellular carcinoma while the other 3 cases were during drainage of intraabdominal collections by pigtail insertions. The rest of iatrogenic perforations occurred intraoperatively (16 cases). Due to delayed presentation, 8 patients (11.6%) died before any intervention. Conservative management was successful in 17 patients (24.6%) with iatrogenic causes, while the other 44 patients (63.8%) were surgically explored according to the etiology. The Overall hospital mortality were 27 cases (40.3%).

Conclusion: Liver cirrhosis carries a negative impact on the prognosis in the patients with perforated vissus. Delayed presentation of perforated vissus carries dreadful outcome. Conservative management of perforated vissus is a successful alternative option especially in iatrogenic perforation. Early diagnosis and management is mandatory to improve the outcome in patients with liver cirrhosis.

PP1-105
Small Bowel Obstruction Caused by Single Adhesive Band: Laparoscopic Operative Treatment Should Take Priority Over Non-Operative Treatment
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Background: Small bowel obstruction (SBO) is a frequent cause of emergency surgical admission. Most surgeons advocate a trial of non-operative treatment (NT), but others favor operative treatment (OT) because of the high recurrence, morbidity and mortality rate associated with delaying surgery. We compared the postoperative outcomes of the two groups (OT and NT) to evaluate a better result for SBO, especially, caused by single adhesive band.

Methods: Among the total 62 patients, 16 were in the OT group (operated by laparoscopy) and 46 in the NT group. Early (duration of hospital stay, time to first flatus, oral intake and defecation after start of treatment, as well as morbidity and mortality) and late postoperative outcomes (the recurrence rate, the time interval between discharge and recurrence of SBO) were evaluated.

Results: The times to first flatus, oral intake and defecation after treatment were significantly shorter in the OT group (p = 0.03, 0.033 and 0.024). The recurrence rate was significantly lower in the OT group than in the NT group (6.2 vs. 32.6 percent, p = 0.038). The time from discharge to first recurrence was significantly longer in the OT group than in the NT group (172 vs. 104.6 ± 26.5 days, p = 0.027).

Conclusions: SBO with single adhesive band is not effectively treated by NT, however, OT has notable success if the surgery is performed early. Therefore, patients presenting with SBO especially, caused by single adhesive band can be initially managed with laparoscopic OT.

Keywords: Small bowel obstruction, Laparoscopy, Operative treatment.

PP1-106
Laparoscopic Excision of Extra Intestinal Mesenteric GIST
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Background: Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal tumors of the gastrointestinal tract; however they account for less than 3% of all GI neoplasm. Extra intestinal GIST (E-GIST) is rare and arises outside the GI tract. Complete surgical resection with negative margins remains the only true means of cure. However, laparoscopic approach to E-GIST is less studied.

Case: Our patient was a 50 year lady who presented with partial intestinal obstruction. CT abdomen findings were suggestive of 8x8x6 cm sized intra peritoneal tumour in relation to small bowel. During laparoscopy it was seen that the tumour was arising from the mesentery and safe excision was possible without compromising the vascularity of bowel and segmental bowel resection could be avoided. Biopsy findings were consistent with histological findings of GIST of low grade. Patient had an uneventful recovery and could be discharged on 3rd post-operative day.

Discussion: There is no abundant literature to guide the standard of care for extra intestinal GIST as majority of work has been done for Gastric GIST which is more common. Role of laparoscopy for GISTs was previously advocated for lesions up to 2 cm only. But many recent studies have advocated that laparoscopic/laparoendoscopic resection of larger sized lesion is feasible with lower morbidity and shorter hospital stay. Laparoscopy has a significant role in management of GIST especially extra-intestinal mesenteric GIST whose excision is simple and does not require advanced laparoscopic skills of bowel Anastomosis and stapling.

Keywords: E-GIST, Laparoscopic GIST.
Methods: This retrospective case-control study was based on medical records from a single tertiary medical center located in Daejeon, Republic of Korea. The records of 317 patients with esophageal squamous cell carcinoma treated with surgery or concurrent chemoradiotherapy between January 2009 and December 2015 were reviewed, and 160 patients were ultimately selected. These 160 patients were divided into two groups based on their endoscopic passage findings: group A (possible endoscopic passage group), and group B (impossible endoscopic passage group, including patients requiring a pediatric endoscope for passage due to resistance). We then compared the clinical and endoscopic characteristics of these two groups retrospectively.

Results: Of the 160 enrolled patients, 92 (57.5%) patients were assigned to group A and 68 (42.5%) to group B. Early stage esophageal squamous cell carcinoma (stage I, II) was significantly more prevalent in group A than in group B patients (P < 0.05), and endoscopic stents were less frequently required in group A than in group B patients (P < 0.05). Overall survival was better in group A than in group B patients (85.5% vs. 41.4%, P < 0.05). Progression-free survival was better in group A than in group B patients (52.3% vs. 20.7%, P < 0.05).

Conclusion: Our data suggest that endoscopic passage was an important prognostic factor in terms of overall survival and progression-free survival in patients with early stage or locally advanced esophageal squamous cell carcinoma treated with surgery or concurrent chemoradiotherapy.

Keywords: Endoscopic passage, Esophageal squamous cell carcinoma, Surgery, Concurrent chemoradiotherapy.

**PP1-108**

**Endoscopic Surveillance for Benign-Looking Gastric Ulcers May Be Unnecessary**

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Background/Aims: Surveillance endoscopy is recommended after treatment of a benign gastric ulcer in Korea. Yet, improved survival secondary to an endoscopic follow-up strategy is controversial. Thus, the aim of this study was to understand the results of gastric ulcer surveillance endoscopy and to individualize surveillance endoscopy by analyzing known risk factors for gastric cancer.

Methods: A total of 599 (M: F = 424:175, median age = 55.4 years) patients diagnosed with a gastric ulcer who received follow-up endoscopy between January 2003 and August 2014 were enrolled retrospectively in this study. The final results and risk factors of follow-up endoscopy were analyzed.

Results: Multivariate analysis of the data between the benign and malignant ulcer groups (benign: malignant = 575:24) showed that an elevated border and irregular margins among other risk factors were significant indicators of malignancy (p < 0.05). Of the 599, 15 (2.5%) were histologically malignant based on the first biopsy results. Nine (1.5%) patients had malignant ulcers on surveillance endoscopy, and all nine were atypia or dysplasia on first biopsy. Eight of the nine patients had malignant endoscopic features.

**Conclusion:** Surveillance endoscopy for gastric ulcers may be unnecessary, except in cases of malignant and pre-malignant endoscopic features on initial endoscopy.

**Keywords:** Surveillance, Endoscopy, Stomach ulcer, Stomach neoplasm.

**PP1-109**

A Difficult Case of Treatment of Tracheobronchial Invasion of Esophageal Cancer

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A 57-year-old man had chest discomfort and hoarseness 8 months earlier. He presented with dyspnea and was brought to emergency room in our hospital. Chest computed tomography (CT) showed a wall thickening of the esophagus suggestive of esophageal cancer and a tumor suggestive of swelling of lymph node measuring 40 mm in diameter. Because the tumor invaded a left main bronchus and caused obstruction of the bronchus, he presented with dyspnea. After then, his respiratory state went into a decline, and tracheal intubation was performed in him. On the eight day after admission a bronchial stent was placed. Then he was treated with chemoradiotherapy (chemotherapy: cisplatin and 5-fluorouracil, radiotherapy: 57.4Gy). After discharge from a hospital, chemotherapy was administered with FP regimen followed by docetaxel. Seven month after a first visit, he presented with cancer pain and was admitted to a hospital to control pain. On the nine day after second admission he had abdominal pains suddenly. Abdominal CT showed a large quantity of fluid and free intraperitoneal air. Emergency laparotomy with a diagnosis of gastrointestinal perforation revealed a giant perforating site at the anterior wall of the upper body of the stomach. Size of rapture was about 5 cm. Local resection of stomach was performed. He was treated with postoperative intensive therapy, but died forty third days after surgery. We consider that the cause of gastric perforation was effect of radiation or acute gastric dilatation. This case was difficult with therapeutic strategy.

**Keywords:** Tracheobronchial invasion, Esophageal cancer, Perforation, Chemoradiotherapy.

**PP1-110**

Large GIST of the Stomach Mimicking a Liver Tumour: A Case Report

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A gastrointestinal stromal tumor (GIST) is a type of tumor that occurs in the gastrointestinal tract, most commonly in the stomach or small intestine. Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal neoplasms of the gastrointestinal...
Tale of Two Tumours

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Background: Two rare cases with unusual presentation and unique histopathological diagnosis are presented here. They highlight the need for considering alternative diagnoses & aggressive surgical approach when atypical clinical presentations are encountered in practice.

Methods:

Case I: A 61 year old male presented with features of dyspeptic symptoms and recent onset of abdominal pain and vomiting. Prior evaluation with Colonoscopy and Capsule endoscopy revealed ileal ulcers and he had received empirical treatment for tuberculosis. Evaluation with CT Abdomen revealed long segment ileal stricture with small bowel obstruction. As he failed to respond to conservative management, laparotomy and adhesiolysis was done. As the patient failed to improve following the initial surgery, redo surgery with Radical resection of strictured small bowel, jejunoscopy and mucus fistula was done.

Case II: A 53 year old gentleman presented with painless lump in the abdomen of 10 years duration and recent onset of melaena. He was evaluated and diagnosed to have a 'pseudocyst' of pancreas elsewhere. Repeat evaluation with CT scan revealed a 30 x 25 cms cystic lesion with solid components occupying the entire abdomen with extensive vascularity. Exploratory Laparotomy confirmed the above and the lesion was found to be arising from the proximal jejunum. En Bloc resection of the tumour and jejunum with Stapling of the DJ flexure, Side to Side Duodenojejunostomy and Feeding Jejunostomy was done.

Results: Both patients had an uneventful postoperative recovery and are disease free at 1 year follow up.

Case I: Histopathology revealed Aggressive Mesenteric Fibromatosis with moderate degree of Mitotic activity, confirmed on Immunohistochemistry.

Case II: Histopathology revealed Gangliocytic Paraganglioma of the Proximal Jejunum, confirmed on Immunohistochemistry.

Conclusion: These cases highlight the need for a high index of suspicion for neoplastic lesions in the setting of atypical clinical presentations. An aggressive Surgical approach helps in establishing a diagnosis as well as providing cure.

Keywords: Mesenteric fibromatosis, Paraganglioma.
and postoperative outcome between robotic, laparoscopic and open gastrectomies for gastric adenocarcinoma.

**Methods:** Retrospective cohort of 85 consecutive patients that underwent total or partial gastrectomy for gastric adenocarcinoma at Rambam Hospital during 2012–2015. For each patient data was collected on basic demographic characteristics, BMI, operating room time (ORT), number of dissected lymph nodes (LN), length of hospitalization (LOH), intra and postoperative complications. Non parametric statistical tests MW and Kruskal-Wallis were used for group comparisons.

**Results:** Study population included 55 patients after total gastrectomies, 10 of them robotic and 30 partial gastrectomies, 12 of them robotic. Age, gender and BMI were similar between patients who underwent robotic, laparoscopic and open procedures. Median length of hospitalization (LOH) for robotic total gastrectomy was 4.5 days and it was significantly shorter than both laparoscopic total gastrectomy (LTG) 7.0 days (p = 0.003) and open total gastrectomy (OTG) 9.0 days (p < 0.001). Similar significant differences in LOH between the 3 groups were observed among patients who underwent partial gastrectomy, but the comparison between robotic and laparoscopic procedures was limited due to small numbers of LPG. Median ORT was significantly longer among robotic gastrectomies compared to open, the difference was 64 min in total gastrectomy group and 145 min in partial gastrectomy group (p < 0.001 for both differences), but the difference in ORT between laparoscopic and robotic procedures were smaller and non-significant. The number of dissected LN was similar between the 3 procedures in total gastrectomies. In partial gastrectomies, the number of dissected LN was even higher among both laparoscopic and robotic gastrectomies compared to open (p < 0.001).

**Conclusion:** Robotic total and partial gastrectomies for gastric adenocarcinoma are associated with oncologically adequate lymphadenectomy and faster patient recovery, but longer operating time.

**Keywords:** Robotic, Gastrectomy, Gastric, Cancer.

**PP1-114**

**3-Dimensional Stomach Volume Estimation with CT Gastrography for Minimally Invasive Endoscopic Therapy**

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**Background/Aims:** Endoscopic bariatric treatment may provide a minimal invasive alternative for surgical procedures in the treatment of obesity. Because several endoscopic treatments for obesity employs volume restriction mechanism, it is important to define anatomic factors of stomach in the obese patients for endoscopic bariatric treatment. But, there is no objective tool which could assess the structural component of the stomach and few literature regarding proper measurement of the stomach in patients with obesity. The aim of study was objective estimation of individual stomach.

**Methods:** 93 patients with different degrees of obesity were compared using 3-dimensional CT gastrography. Measurements included total volume of distended stomach, abdominal diameter and abdominal fat volume (visceral fat and subcutaneous fat). Patients’ baseline characteristics and laboratory findings were collected. We performed statistical analysis.

**Results:** Stomach volume measured by 3-dimensional CT gastrography ranged from 268 to 751 ml. In obese patients, stomach capacity was increased than non-obese patients. It presented 572 ± 301.60 ml in patients with BMI ≥25 kg/m², 438.56 ± 163.43 ml in patients with BMI <25 kg/m². Increased values of visceral fat volume, abdominal circumference, and visceral/subcutaneous fat ratio were shown to be associated with increased stomach volume.

**Conclusions:** In this study, we have demonstrated that stomach volume was associated the degree of obesity. Objective estimation of individual stomach may offer proper therapeutic approach to the obese patients who need less invasive and more effective bariatric treatment.

**Keywords:** Minimally invasive endoscopic therapy, 3-dimensional CT gastrography.

**PP1-115**

**Effect of Esophagus Position on Surgical Difficulty and Postoperative Morbidities after Esophagectomy for Esophageal Cancer**

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**Objective:** Thoracoscopic esophagectomy for the deep-seated (left-sided) esophagus has several technical difficulties, which may affects the intraoperative or postoperative outcomes. However, no previous studies have focused on the correlation between the position of the esophagus and short-term outcome after thoracoscopic esophagectomy.

**Methods:** A total of 484 esophagectomies who underwent thoracoscopic esophagectomy for esophageal cancer between April 2005 and April 2016 in Kumamoto University Hospital were examined. The position of the esophagus was divided into two types: deep-seated esophagus or another type based on computed tomographic (CT) images in the supine position.

**Results:** In thoracoscopic esophagectomy (n = 147), the deep-seated esophagus was associated with a longer operation time in the thorax and high incidence of severe morbidity of Clavien-Dindo classification (CDc) ≥IIIb, pneumonia, and any pulmonary morbidity. The deep-seated esophagus was also an independent risk factor for any pulmonary morbidity (HR 2.59; 95% CI 1.033–6.484; p = 0.042), along with diabetes mellitus (HR 2.99; 95% CI 1.043–8.545; p = 0.041) and past smoking history of Brinkman index >400 (HR 6.70; 95% CI 1.478–30.36; p = 0.014). On the other hand, in open esophagectomy (n = 337), the deep-seated esophagus did not affect operation time and any postoperative complications.

**Conclusions:** In this study, we have demonstrated that stomach volume was associated the degree of obesity. Objective estimation of individual stomach may offer proper therapeutic approach to the obese patients who need less invasive and more effective bariatric treatment.

**Keywords:** Minimally invasive endoscopic therapy, 3-dimensional CT gastrography.
Conclusions: The position of the esophagus had a strong influence on the difficulty of thoracoscopic esophagectomy and the incidence of postoperative morbidities. Surgeons would be well advised to keep a careful watch perioperatively for patients with a deep-seated esophagus.

Keywords: Esophagectomy, Esophageal position, Morbidity.

PP1-116
Use of Y-Shaped, Fully Coated Self-Expandable Metallic Stent for Benign Anastomotic Stenosis after Gastrojejunostomy (Billroth II):
A Retrospective Review of 8 Patients
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Aim: To assess the safety and efficacy of Y-shaped, fully coated self-expandable metallic stent for benign anastomotic stenosis after gastrojejunostomy (Billroth II).

Method: From January 2008 to March 2016, 8 patients with benign biliary-enteric anastomosis strictures were retrospectively studied. Integrated Y-shaped, fully coated self-expandable metallic stents were designed according to the pathologic anatomy of residual stomach-jejunal anastomotic stricture. Eight stents were inserted under fluoroscopy and removed after 3 months. Stent/anastomosis patency was checked at 1, 3, 9 and 12 months.

Result: All stents were inserted once successfully and removed without complications after three months. Symptoms such as abdominal distension, nausea and vomiting were disappeared. All patients were followed-up for 4–92 months (mean 21.9 months). Two patients died at the time of 7.2 and 16 months, of which the reason were tumor recurrence (1 case) and SAH (1 case). The other six patients were living well and no restenoses were observed at 1, 3, 9 or 12 months.

Conclusion: Y-shaped, fully coated self-expandable metallic stent for benign anastomotic stenosis after gastrojejunostomy (Billroth II) is simple, safe and feasible, and thus worth popularizing.

Keywords: Anastomotic stenosis, Stent, Benign.

PP1-117
A Case of Laparoscopic Para-Aortic Lymph Node Dissection after Adjuvant Chemotherapy for Advanced Gastric Cancer
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A 62-year-old female who was diagnosed with advanced gastric cancer in the posterior wall of lower body. Biopsy revealed a poorly differentiated adenocarcinoma. Computed tomography demonstrated the gastric cancer and the left adrenal gland mass. The left adrenal gland lesion was suggested a metastasis, neurogenic tumor or paraganglioma. Enlargement of the para-aortic lymph node was not identified on the computed tomography.

We had performed totally laparoscopic distal gastrectomy with D2 lymphadenectomy, left adrenalectomy and Roux-en Y gastrojejunostomy. The histopathologic finding of primary tumor yielded mixed carcinoma [pT4aN3b(25/91)M0]. The left adrenal gland lesion was revealed a focal adrenal hyperplasia. At 27 days after the operation, adjuvant systemic chemotherapy was initiated with XELOX. Newly appeared left para-aortic nodular lesion was identified on follow-up computed tomography. After 8 cycles of XELOX, computed tomography indicated slightly decreasing of the left para-aortic nodular lesion in size. Our multidisciplinary team recommended to perform laparoscopic para-aortic lymph node dissection for curative intent.

The 5-port system was used. An umbilical port was changed from 12 mm port to single glove port for adhesiolysis and dissection and the other ports were 5 mm port. We confirmed that there was no evidence of peritoneal seeding in the diagnostic laparoscopy. Dissection was performed along the inferior border of pancreas. The nodular lesion was identified at supero-posterior to left renal artery. The 16a2 lymphadenectomy was performed. The total operative time was about 120 minutes and estimated blood loss was minimal.

The pathologic result showed no metastasis in harvested 13 lymph nodes (No. 16a2). The patient was discharged at postoperative 4 days without any complication. Laparoscopic para-aortic lymph node dissection in advanced gastric cancer is technically feasible. However, it is still uncertain about the benefit of para-aortic lymph node dissection in advanced gastric cancer.

Keywords: Advanced gastric cancer, Para-Aortic lymph node, Laparoscopy.

PP1-118
Esophageal Neuroendocrine Tumor: Case Report
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Background: Neuroendocrine tumor (NET)s of the esophagus are extremely rare, aggressive and have a poor prognosis. In addition, the optimum treatment has not been established due to the rarity of the condition. Accurate differential diagnosis is important because treatments and clinical courses differ from those of esophageal squamous cell carcinomas. Combined therapy using chemotherapy, radiotherapy and/or surgery appear effective for them. We present an adult case in whom the clinical symptoms were dysphagia.

Method: A 46-year-old female presented with dysphagia. Upper gastrointestinal endoscope revealed a localized ulcerative lesion in the middle esophagus. Histology of biopsy specimens indicated a neuroendocrine carcinoma. The tumor cells were arranged in microtubular structures, with small and round cells containing scanty cytoplasm. They were positive for synaptophysin and chromogranin.
with persistent dysphagia after fundoplication surgery. Evaluate clinical outcomes and identify clinical factors associated with successful response to pneumatic dilation for treatment are limited. The aim of this study was to evaluate clinical outcomes and identify clinical factors associated with successful response to pneumatic dilation among patients with persistent dysphagia after fundoplication surgery.

**Method:** We retrospectively evaluated patients who had undergone pneumatic dilation for persistent post-fundoplication dysphagia between 1999 and 2016 at Mayo Clinic, Rochester MN. Patients with dysphagia prior to fundoplication were excluded. Demographic information, surgical history, severity of dysphagia, and clinical outcomes were collected. Data pertaining to esophagram, esophageal manometry, endoscopy, and pneumatic dilation were also collected. Severity of dysphagia was graded using the Dakkak-Bennet score which grades dysphagia as follows: 0 = normal, 1 = dysphagia to solid food, 2 = dysphagia to semi solid food, 3 = liquid only, 4 = complete dysphagia.

**Result:** We identified 38 patients (82% female, 95% Caucasian, and mean age 50 years old) with post-fundoplication dysphagia who completed pneumatic dilation. The median post-fundoplication dysphagia score was 2. Twenty-four percent had abnormal peristalsis on manometry. Fifty-eight percent reported immediate post-treatment dysphagia score was 2. Twenty-four percent developed complications, including wrap disruption and pneumoperitoneum.

**Conclusion:** Pneumatic dilation is an effective treatment for persistent post-fundoplication dysphagia. The rate of complication is higher than previously reported.

**Keywords:** Dysphagia, Pneumatic dilation, Post fundoplication.
Carcinosarcoma is a rare biphasic tumor which can present as a gastric Carcinoma. For accurate diagnosis of this infrequently occurring tumor, detailed immunohistochemical analysis is important in addition to Hematoxylin and eosin staining, endoscopic and radiology findings.

**Keywords:** Carcinosarcoma, Gastric, Pathology, Immunohistochemistry.

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**PP1-123**

**High Dose Ilaprazole/Amoxicillin as First Line Regimen for Helicobacter Pylori Infection in Korea**

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**Objective:** Helicobacter pylori (H. pylori) is etiologically related to gastric cancer. H. pylori eradication rate after standard triple therapy has decreased over the past few decades. Amoxicillin remains the preferred antibiotic due to its bactericidal effects and low resistance. This study determined whether high dose dual therapy is effective for eradicating H. pylori in Koreans.

**Methods:** This was an open labeled study of H. pylori infected treatment-naive patients. Subjects received dual therapy for 14 days; ilaprazole 40 mg tablets given twice daily and amoxicillin 750 mg tablets given four times daily. At the end of therapy, the subjects visited the clinic to confirm compliance and monitor side effects. They visited again after 4–6 weeks for a urea breath test to evaluate their H. pylori status.

**Results:** The H. pylori to-treat analysis eradication rate was 79.3% (23 of 29) (95% confidence interval: 61.6–90.2) and 82.1% (23 of 28) by the per protocol analysis. CYP2C19 gene polymorphisms did not affect the eradication rate. Compliance rates were high (96.6%) and side effects were minimal and tolerable.

**Conclusion:** High dose ilaprazole + amoxicillin was ineffective as the first line regimen for eradicating H. pylori in Koreans. Future studies should focus on intragastric pH measurements and assess amoxicillin resistance.

**Keywords:** Helicobacter pylori, Eradication therapy, Proton-pump inhibitors, Ilaprazole, Amoxicillin.
Circulating microRNA-196a/b are Novel Biomarkers Associated with Metastatic Gastric Cancer

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Background: MiR-196a and/or miR-196b, involved in cancer initiation and progression, are frequently upregulated in tumor tissues. However, the clinical significance of these miRNAs in gastric cancer (GC) remains to be clarified. In the current study, we investigated the potential utility of circulating miR-196a/b as novel biomarkers for early detection and/or metastatic prognosis of GC.

Method: qRT-PCR was used to analyse the expression of plasma miRNAs. Plasma miR-196a/b expression was normalized to endogenous control miR-16. All calculations were normalized to the endogenous control miR-16. The relative quantitation value for the plasma miR196a/b compared to its calibrator is expressed as 2-ΔΔCt method. Detailed clinical features for each GC patient, including age, gender, clinical stage, tumor size, tumor location and survival time were available.

Result: qRT-PCR data revealed markedly higher preoperative circulating miR-196a and miR-196b levels in GC patients than healthy controls. Receiver-operating characteristics (ROC) curve analysis showed that circulating miR-196a, miR-196b and combined miR-196a/b (the sum of miR-196a and miR-196b) are more effective than CEA or CA19-9 alone in distinguishing GC patients from healthy controls, with higher sensitivity and specificity. Circulating miR-196a exhibited higher diagnostic capacity than combined miR-196a/b or miR-196b alone, highlighting its potential as an effective plasma biomarker for GC. In clinicopathological analysis, elevated circulating miR-196a/b levels were highly correlated with metastatic potential or more advanced stages of disease and poorer survival. In addition, the expression levels of circulating miR-196a/b were reduced after surgical resection in GC patients.

Conclusion: Taken together, we propose that circulating miR-196a/b serve as a more sensitive and specific novel biomarker than CA19-9 for GC monitor, diagnosis and prognosis.

Keywords: Circulating miRNA-196a,b, Gastric cancer, Prognosis.

Coexistence of Gastrointestinal Stromal Tumor and Inflammatory Myofibroblastic Tumor of the Stomach Presenting as a Collision Tumor

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Collision tumors of the stomach are rare. We report on a case of a collision tumor consisting of a gastrointestinal stromal tumor (GIST) and an inflammatory myofibroblastic tumor (IMT) of the stomach in a 16-year-old female. A polypoid mass located in the distal body of the stomach was observed on abdominal computed tomography. Laparoscopic wedge resection of the stomach and 4 d lymph node biopsy was performed. On gross examination, a protruding submucosal mass, measuring 4 × 3.5 × 2.5 cm in size, was detected. Histological examination showed two distinct GIST and IMT component presenting a collision tumor. The small nodular area, composed of CD117-positive spindle cells, was typical of GIST, and the adjacent larger area, composed of myofibroblastic spindle cells with prominent chronic inflammatory cells infiltrate, mainly lymphocytes and plasma cells, had a characteristic appearance of IMT. The 4 d lymph node showed metastatic inflammatory myofibroblastic tumor. To the best of our knowledge, this is the first case of a collision tumor consisting of a GIST and an IMT arising in the stomach.

Keywords: Gastrointestinal stromal tumor, Inflammatory myofibroblastic tumor, Collision tumor.

Oesophageal Cancer in a High-Risk Area of North-Eastern Sudan: Case Control Study

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Background: Oesophageal cancer is a common disease in the Beja tribe of north-eastern Sudan. There is a need to study the different aetiological factors, environmental, genetics and social habits. This preliminary study intended to investigate the correlation between GSTM1 and GSTT1, hot coffee consumption which contain Ginger, low consumption of fresh fruit and vegetables in addition to inhalation of fuel wood smoke. The aim of this study was to correlate between genetic and environmental risk factors and oesophageal cancer.

Material and Methods: A case-control study was conducted in north-eastern part of the Sudan including oesophageal cancer patients and controls. Data was collected using a questionnaires and analysis of Glutathione S-transferase enzyme using (PCR), while fuel wood and ginger analyzed by chemical photo-analysis.

Results: Forty two patients with oesophageal cancer and 63 healthy controls were studied, the male to female ratio was 1:3, and the majority of patients reside in Kassala state and belong to Beja ethnic group. Their food intake was deficient in fruits and vegetables, and the majority drink hot coffee with Ginger more than 10 times per day. In our study there was a significant association between GSTT1 null genotype and increased risk of oesophageal cancer. Fuel wood photochemical analysis showed high concentration of volatile organic matters (saponins, sterols, triterpenes, phenolic compounds, Flavonoids). Ginger is frequently added to hot coffee drinks.

Conclusion: There is a significant association between GSTT1 null genotype and increased risk of oesophageal cancer, while many studies linked between inhalation of fuel wood smoke with bronchogenic carcinoma, we need further investigation to define the association between inhalation of fuel wood smoke and oesophageal cancer, in addition to that the relation between frequent...
Esophageal rupture predominately occurs on the left side, and there are few reports about the mechanism of right-side occurrence and the treatment strategies. A 66-year-old man with a history of esophageal stenosis caused by chronic reflux esophagitis was taken to another hospital because of back pain. He was diagnosed with suspected esophageal rupture on computed tomography, thus he was transported to our hospital. The patient was diagnosed with right-side intrapleural perforating esophageal rupture on esophagography, thus we decided to perform the emergency surgery. A large amount of contaminated pleural effusion and debris were found in the right pleural cavity, and an approximately 5-cm longitudinal foramen was identified in the right-side wall of the lower thoracic esophagus. Considering the risk of re-rupture and leakage, we performed subtotal esophagectomy and gastric tube reconstruction via a retrosternal route. Postoperatively, the clinical course was good without any complications. The weakness of the right-side wall of the esophagus due to chronic inflammation was indicated histopathologically, and that was thought to have been the cause of the right-side esophageal rupture. This case suggests that esophagectomy and one-stage reconstruction can be a treatment choice for esophageal rupture in generally stable patients.

**Keywords:** Esophageal rupture, Right-side, Esophagectomy.

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**PP2-001**

**Management of Residual Gall Bladder and Cystic Duct Stump Stone after Cholecystectomy: Single Egyptian Center Experience**

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**Background:** There is no doubt that cholecystectomy relieve pre surgical symptoms of gall bladder disease. Persistent symptoms following cholecystectomy is termed as postcholecystectomy syndrome (PCS) which varies largely in different studies ranging from 10 to 30%. The incidence of residual gall bladder stone after cholecystectomy is less than 2.5%. This problem may arise as a result of improper dissection of Calot’s triangle especially inexperienced surgeons to avoid injury of CBD leaving too long cystic duct or a partial cholecystectomy in a patient with unclear anatomy. This study is planned to evaluate patients had a residual gall bladder stone/cystic duct stump stone after cholecystectomy and study the outcomes and feasibility of laparoscopic completion cholecystectomy.

**Methods:** A retrospective study of 21 cases with residual gall bladder/cystic duct stump stone. The diagnosis depend on ultra-
sound and MRCP. All cases were managed by completion cholecystectomy either open or laparoscopic. All preoperative, operative and postoperative data were collected.

**Results:** Preoperative ERCP and papillotomy was required in 9 cases presented by obstructive jaundice. Laparoscopic completion cholecystectomy was feasible in 14 cases. The conversion rate was 1/14 cases. The mean operative time was 127 ± 31.3 minutes and mean blood loss was 165 ± 74.5 cc. Intraoperative minor biliary injury occurred in one case. The mean hospital stay was 3.1 ± 1.8 days (1–9 days). All patients became symptom free on follow up after surgery.

**Conclusion:** Residual gall bladder/cystic duct stump stone is a preventable and correctable cause of PCS. completion cholecystectomy is definite treatment to relieve symptoms and avoid complications and can be carried out laparoscopically.

**Keywords:** Residual gall bladder, Completion cholecystectomy, Postcholecystectomy syndrome.

## PP2-002

**Cystic Neoplasm of Pancreas after Pancreatectomy: Long Term Follow-Up on Recurrence and Survival**

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**Background:** Operative treatment is necessary for cystic neoplasm of pancreas if they are potential malignant, malignant and symptomatic. Usually small pancreatic remnant is left behind. This study aimed to assess the long-term outcome of the patients after undergoing subtotal pancreatectomy.

**Methods:** Patients who had undergone pancreatico-duodenectomy or subtotal pancreatectomy for cystic neoplasm of pancreas from January 2004 to June 2015 at Queen Mary Hospital, Hong Kong, were retrospectively reviewed. Demographics, tumor characteristics, operative details, postoperative and oncological outcomes, and presence of recurrent lesions were reviewed.

**Results:** A total of 24 patients underwent partial pancreatectomy for cystic neoplasm of the pancreas during the study period. Patients’ median age was 61.5 years old, with male predominant (18:6). They usually complained of abdominal pain (n = 11). Preoperative tumor markers were normal with CEA 2.9 ng/ml and Ca 19.9 15 U/ml respectively. Pancreatico-duodenectomy was performed in 20 patients (83.3%), while distal pancreatectomy was performed in 4 patients (16.7%). 17 patients had intrapapillary mucinous neoplasm (IPMN), 6 patients had mucinous adenoma and one had serous cystadenoma. Four of the IPMN were malignant (16.7%), while the rest were benign (83.3%). For all the benign disease, long term follow-up suggested that there was no recurrent disease in the pancreatic remnant.

**Conclusion:** This result showed that cystic neoplasm of the pancreas can be aggressive as carcinoma of pancreas; while the recurrence rate of the tumor in the pancreatic remnant is low, suggesting the adequacy of partial pancreatectomy.

**Keywords:** Cystic neoplasm of pancreas, Pancreatico-duodenectomy, Subtotal pancreatectomy, Recurrence.
PP2-004
Nrf2 Overexpression Is Associated with Chemoresistance in Patients with Distal Bile Duct Cancer
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Background: The Nrf2 (NF-E2 related factor 2) plays in the protection of our body against drug toxicity and stress induced diseases by producing antioxidant protein. Keap1(kelch-like ECH-associated protein 1) regulate the activity of Nrf2. Malignant cells could hijack Nrf2 activity to support their malignant growth with chemoresistance.

Methods: From January 2005 to December 2012, we consecutively collected 91 patients who underwent curative surgery for distal bile duct cancer. The patient was divided into chemotherapy (CTX) group and no CTX group. The activity of Keap1 and Nrf2 was investigated by immunohistochemical staining methods. The Keap1/Nrf2 pathway and clinical outcomes were analyzed.

Results: The median age was 69 years (range, 47 to 88) and median follow up period was 23 months. We performed adjuvant CTX in 23 patients (25%). In no CTX group, the Keap1 was strongly positive in 45 patients (66%) and the Nrf2 was strongly positive in 29 patients (43%). In CTX group, the Keap1 was strongly positive in 15 patients (52%) and the Nrf2 was strongly positive in 11 patients (48%). The activity of Nrf2 was associated with overall survival in CTX group on Kaplan-Meier survival analysis (p = 0.018) although there was no difference in no CTX group (p = 0.901). However, the Keap1 did not influence on the expression level of Nrf2.

Conclusion: The chemotherapy is less effective if the level of Nrf2 is strongly positive on immunohistochemistry. The expression level of Nrf2 is an important factor to select patients for chemotherapy.

Keywords: Keap1, Nrf2, Cholangiocarcinoma, Neoplasm, Chemotherapy.

PP2-005
Percutaneous Transhepatic Biliary Drainage Tract Recurrence after Resection of Hilar Cholangiocarcinoma
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Background/Aims: Percutaneous transhepatic biliary drainage (PTBD) is widely used to resolve jaundice before surgery for hilar cholangiocarcinoma. Catheter tract recurrence is rare but a serious complication of PTBD. However, the evidence is limited. The aim of this study was to estimate the incidence and associated risk factors of catheter tract recurrence.

Methods: From January 2003 to October 2014, 178 patients with hilar cholangiocarcinoma who underwent curative resection in a single medical center. Nine patients were lost during follow up and 169 patients were included in this study. The medical records were analyzed retrospectively.

Results: Of the 169 patients, 141 underwent preoperative biliary decompression, 89 by PTBD, 37 by endoscopic, and 15 by both. Of the 104 patients who underwent PTBD, catheter tract recurrence was detected in 6 (5.8%) patients. Four patients were in stage II and 2 patients in stage IIIa. Two patients had Bismuth type IV, 2 patients had type IIIa, and 2 had type I. Four patients had 2 PTBDs and 2 patients had 1 PTBD. The mean interval between surgery and onset of the recurrence was 7.4 months. The mean duration of PTBD was significantly longer in the patients with catheter tract recurrence (47.2 days vs. 29.3 days, p = 0.011), however the number of catheter was not different significantly. The progression free survival was significantly shorter in the patients with catheter tract recurrence (7.4 months vs. 20.7 months, p < 0.001). The overall survival was also significantly shorter in the patients with catheter tract recurrence (14.7 months vs. 27.6 months, p < 0.001).

Conclusions: The PTBD catheter tract recurrence after curative resection of hilar cholangiocarcinoma is not negligible. To prevent this complication, shorter duration of drainage should be considered when drainage is indicated.

Keywords: Tract recurrence, PTBD, Hilar cholangiocarcinoma.

PP2-006
Prognostic Factors Predicting Long-Term Survival after Resection of Gallbladder Carcinoma
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Background: Although an aggressive surgical approach has been advocated when performing radical resection for gallbladder carcinoma, consensus regarding long-term outcomes depending on the extent of the disease has not been established. This study aimed to clarify prognostic factors with special focus on patient selection to improve surgical outcomes of gallbladder carcinoma.

Methods: A total of 190 patients who underwent radical resection for gallbladder carcinoma were analyzed. Factors influencing long-term survival were identified using univariate and multivariate analyses. Identified factors were used to determine risk groups and to evaluate the effects on patient survival.

Results: Inapparent tumor, jaundice, direct invasion to the liver, involvement of adjacent organs other than the liver, regional lymph node metastasis, and distant metastasis were significant in univariate analysis. Multivariate analysis identified direct invasion to the liver, involvement of adjacent organs other than the liver,
than the liver, and regional lymph node metastasis. 
rect invasion to the liver, involvement of adjacent organs other 
gallbladder carcinoma have only one of following risk factors: di-
110
15), and regional lymph node metastasis (n = 32) were 40%, 54%,
er (n = 6), involvement of adjacent organs other than the liver (n =
and regional lymph node metastasis (n = 32) were 40%, 54%, 24%
and 65%, respectively (P = 0.540).

Conclusions: Better outcomes are expected if patients with 
gallbladder carcinoma have only one of following risk factors: di-
rect invasion to the liver, involvement of adjacent organs other than the liver, and regional lymph node metastasis.

Keywords: Gallbladder carcinoma, Prognostic factors.

PP2-007
Human Equilibrative Transporter 1 (hENT1) Expression Is Not Predictive for Gemcitabine Outcome in Patients with Advanced Biliary Tract Cancer

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Background/Aims: Human equilibrative nucleoside transporter 1 (hENT1) is the major transporter responsible for gemcitabine uptake into cells. hENT1 expression has been proposed as one of predictive biomarkers for gemcitabine sensitivity in patients with pancreatic cancer. However, the prognostic roles of hENT1 expression in patients with advanced biliary tract cancer (BTC) have not been evaluated so far. The aim of this study was to investigate the association between the expression of HENT1 and disease outcome in patients with advanced BTC treated with gemcitabine.

Method: Pathological specimens were collected from 101 BTC patients who received first-line palliative chemotherapy with gemcitabine at Seoul National University Hospital between 2006 and 2013. Immunostainings with Rabbit Anti-Human hENT1 monoclonal antibody (Clone SP120) were performed in those specimens. The patients were divided into two groups according to hENT1 expression, and compared in terms of overall survival (OS), progression-free survival (PFS), and response rate (RR).

Result: Immunostainings of specimens from 101 patients (60 males; mean age, 61.6 ± 9.2 years) were interpreted by a single pathologist. Twenty-one (20.8%) gallbladder cancers, 18 (17.8%) extrahepatic, and 62 (61.4%) intrahepatic cholangiocarcinomas were included. They consisted of 27 (26.7%) locally advanced and 74 (73.3%) metastatic cancers. Positive hENT1 expression was observed in 49 (48.5%) patients, who showed median 8.77 ± 1.15 months of OS and 3.80 ± 0.68 months of PFS, with no significant difference compared with the negative group. RR of positive group (49.0%) was also not significantly different from that of negative group (48.1%). When negative and mild intensity were classified as low expression, OS, PFS, and RR were also not significantly different between low and high expression group.

Conclusions: There was no evidence supporting the use of hENT1 as a predictive marker for gemcitabine efficacy in patients with advanced BTC.

Keywords: Biliary tract neoplasms, Gemcitabine, Human equilibrative nucleoside transporter 1, hENT1.

PP2-008
The Difference in Clinicopathological Characteristics between Perihilar Cholangiocarcinoma and Hilar Intrahepatic Cholangiocarcinoma

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Background: Difference between hilar cholangiocarcinoma and intrahepatic cholangiocarcinoma is not clear.

Patients and Methods: We performed resection for 133 patients with perihilar cholangiocarcinoma between 1992 and 2013. 133 patients were divided into two groups, such as 99 cases of hilar cholangiocarcinoma (Hilar type) and 34 cases of intrahepatic cholangiocarcinoma with hilar invasion (IHCC type).

Results: 5-year survival rates was significantly poor in IHCC type compared with Hilar type (p = 0.048). In clinical characteristics, there was no significant difference between two groups. Although, in pathological characteristics, the rate of vascular invasion (p = 0.001), small vessel invasion (p = 0.005), lymph vessel invasion (p = 0.001), stage IV (p = 0.04) were significantly higher in IHCC type than that of Hilar type. In Hilar type, case with lymph node metastasis, small vessel invasion and positive exfoliation margin (ew+) have significantly poor overall survival rate (p < 0.05). However, in IHCC type, there was no significant difference with or without lymph node metastasis (p = 0.78). Positive exfoliation margin and small vessel invasion were prognostic factors for IHCC type (p < 0.01). Both groups has significantly better prognosis in cases treated with adjuvant chemotherapy (AC) (Hilar type: p = 0.033, IHCC type: p = 0.003). In cases with lymph node metastasis, there was no significant difference with or without AC. Although, in IHCC type, there was significant better prognosis in patients treated by AC (p = 0.005). In hilar type, there was no significant difference between cases treated with or without neoadjuvant chemotherapy (NAC) (p = 0.123), however, in IHCC type, cases treated with NAC will have better prognosis than cases treated without NAC (p = 0.064).

Conclusions: Survival rate of IHCC type was significantly poor than Hilar type. There are many pathological differences between Hilar and IHCC type. Prognostic factor between Hilar and IHCC type were similar except lymph node metastasis. NAC may improve survival rate of IHCC patients.

Keywords: Perihilar cholangiocarcinoma, Hilar cholangiocarcinoma, Intrahepatic cholangiocarcinoma with hilar invasion.
PP2-009

The Importance of Preoperative Serum CA19-9 Level in the Treatment of Intrahepatic Cholangiocarcinoma

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Background/Aims: It is difficult to predict lymph node metastasis based on imaging findings preoperatively. We routinely sampled the para-aortic lymph nodes (PANs) for frozen-section pathological examinations, and only when no metastasis of PANs was confirmed, curative resection was performed. The aim of this study is to identify the prognostic factors for ICC patients without PANs metastasis, analyze the impacts of regional lymph node metastasis (pN1) and those metastasis on outcomes of ICC patients, and find the biomarkers as preoperative predictors of pN1 and PANs metastasis.

Methods: 46 curatively resected ICC patients without PANs metastasis (non-PANs group) and 15 non-resected ICC patients with PANs metastasis (PANs group) were recruited. Uni- and multi-variate analyses were performed on 17 clinicopathological variables in non-PANs group. By using a receiver operating characteristic (ROC) curve, preoperative non-imaging biomarkers were examined to evaluate the predictive performance for pN1 and PANs metastasis.

Results: Univariate analysis identified the age (>65), preoperative serum carbohydrate antigen (CA) 19-9 level (>100 U/ml), concomitant portal vein resection, concomitant hepatic artery resection, pN1 and positive resection margin as significant negative prognostic factors. In multivariate analysis, CA19-9 level was an independent prognostic factor (p = 0.030, HR 2.92 [95% CI 1.11–7.40]). The 5-year survival rates of patients with pN1 and high CA19-9 level were 13.1% and 15.6%. All 15 patients in PANs group died within 3-years after operation. The area under the ROC curves (AUC) of CA19-9 for prediction of pN1 and PANs metastasis were 0.80 and 0.67. When the cut-off values of CA19-9 were fixed to 100 U/ml and 220 U/ml, its sensitivity, specificity and accuracy for pN1 were 78%, 75% and 76%, and those for PANs metastasis were 73%, 67% and 69%, respectively.

Conclusions: CA19-9 could be a useful biomarker for not only prognosis after curative resection but lymph node metastasis before laparotomy in patients with ICC.

Keywords: Intrahepatic cholangiocarcinoma, Carbohydrate antigen 19-9, CA19-9, Prognosis, Prognostic factor.

PP2-010

Diagnostic Approach Using ERCP-Guided Transpapillary Forceps Biopsy or EUS-Guided Fine-Needle Aspiration Biopsy According to the Nature of Suspected Malignant Biliary Stricture

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Background and Aims: In malignant biliary stricture (MBS), the diagnostic accuracy of ERCP-based tissue sampling is insufficient. EUS-guided fine needle aspiration biopsy (EUS-FNAB) is emerging as a reliable diagnostic procedure. This study aimed to evaluate the usefulness of a diagnostic approach using ERCP-guided transpapillary forceps biopsy (TPB) or EUS-FNAB according to the characteristics of suspected MBS.

Methods: Consecutive patients diagnosed with suspected MBS with obstructive jaundice and/or cholangitis were enrolled prospectively. ERCP with intraductal ultrasonography (IDUS) and TPB were performed as initial diagnostic procedures. Based on the results of imaging studies and IDUS, all MBS were classified as extrinsic or intrinsic type. If the malignancy was not confirmed by TPB, EUS-FNAB for extrinsic type or second TPB for intrinsic type was performed.

Results: Among a total of 178 patients, intrinsic and extrinsic types were detected in 88 and 90 patients, respectively. The diagnostic accuracy of first TPB was significantly higher in intrinsic than extrinsic type (81.8% vs. 67.8, P = 0.023). In 33 patients with extrinsic type and negative for malignancy on first TPB, the diagnostic accuracy of EUS-FNAB was 90.9%. In 19 patients with intrinsic type and negative for malignancy on first TPB, the diagnostic accuracy of second TPB was 84.2%. The diagnostic accuracies of the combination of initial TPB with EUS-FNAB, and second TPB were 96.7% and 96.6%, respectively.

Conclusions: A diagnostic approach using EUS-FNAB or TPB according to the origin of MBS is considered effective to improve the diagnostic accuracy of MBS with negative for malignancy by first TPB.

PP2-011

Laparoscopic Total Pancreatectomy Is a Feasible and Safe Procedure in Selected Patients: Experience from Three Cases and Literature Review

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Aim: Laparoscopic total pancreatectomy is a complicated surgical procedure and rarely been reported. This study reviewed our three cases laparoscopic total pancreatectomy and review
the current literature in terms of the application of this procedure.

**Material and Method:** Three patients underwent laparoscopic total pancreatectomy between May 2014 and August 2015. We reviewed their general demographic data, perioperative details and short-term outcomes. General morbidity was assessed using Clavien-Dindo classification and Delayed Gastric Emptying (DGE) was evaluated by International Study Group of Pancreatic Surgery (ISGPP) definition.

**Results:** The indications for laparoscopic total pancreatectomy were intraductal papillary mucinous neoplasm (IPMN) (n = 2) and pancreatic neuroendocrine tumor (PNET) (n = 1). All patients underwent laparoscopic pylorus and spleen-preserving total pancreatectomy, the mean operative time was 490 min (range 450 to 540 min), the mean estimated blood loss was 266 ml (range 100 to 400 min); two patients suffered from postoperative complication. All the patients recovered uneventfully with conservative treatment and discharged with a mean hospital stay 18 days (range 8 to 24 days). The short-term (from 108 to 600 days) follow up demonstrated three patients had normal and consistent HbA1C level with acceptable quality of life.

**Conclusion:** Laparoscopic total pancreatectomy is feasible and safe in selected patients and pylorus and spleen preserving technique should be considered. Further prospective randomized studies are needed to obtain a comprehensive understanding the role of laparoscopic technique in total pancreatectomy.

**Keywords:** Laparoscopic techniques, Total pancreatectomy, Literature review.

**PP2-012**

**Experience-Based Surgical Approach to Pancreatic Mucinous Cystic Neoplasms with Ovarian-Type Stroma; Yonsei-Nippon Medical School Collaborative Study**

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To elucidate clinicopathologic characteristics of resected mucinous cystic neoplasm (MCN) with ovarian-type stroma, and to suggest a proper surgical approach based on Korean-Japan bi-institutional experiences.

We retrospectively reviewed 55 MCNs with ovarian-type stroma by pathological re-examination. Clinicopathologic features and preoperative clinical parameters were evaluated to predict malignant change in MCNs.

Surgically treated MCNs are recently increasing. All patients were female with mean age, 47.9 ± 13.3 years old. Mural nodule was noted in 8 patients (14.5%), and mean cyst size was 6.1 ± 4.2 cm. Nine patients (16.1%) were reported to have non-invasive mucinous cystadenocarcinoma. Small (R2=-0.079, p = 0.038) and asymptomatic pancreatic MCNs (p = 0.022) are recently increasing (p < 0.05), which resulted in more frequent application of minimally invasive surgery (p < 0.001). During follow-up period (mean 51.6 months (1.1–242.8)), no recurrence or tumor-related death was noted. The presence of mural nodule (p = 0.002) and tumor size (≥4.5 cm, p = 0.027) were potential clinical parameter to predict malignant transformation. Especially, clinical significance was enhanced, especially in large MCN of the pancreas with mural nodule (≥4.5 cm, p = 0.002).

Non-invasive pancreatic MCNs are not aggressive, and minimally invasive pancreatectomy would be an ideal approach for well-selected patients.

**Keywords:** Mucinous cystic neoplasm, Laparoscopic, Robotic, Pancreatectomy.

**PP2-013**

**A Novel ‘Superior Mesenteric Artery First’ Approach in Laparoscopic Pancreatoduodenectomy with Major Vascular Resection: The Middle Approach**

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**Background:** Open pancreatoduodenectomy (PD) with major vascular resection has been shown in many studies to have perioperative and oncological outcomes that are similar to those of patients underwent PD without venous involvement. However, it is technical challenging to perform laparoscopic pancreatoduodenectomy (LPD), which was rarely reported around world.

**Method:** From December 2015 to May 2016, eight cases of LPD with major vascular resection were performed in our institution. A novel ‘Superior Mesenteric Artery First’ approach was applied. The demographic characteristics, intra-operative data and post-operative data were prospectively collected and analyzed.

**Result:** Five male patients and three female patients were included in this study, with a mean age of 59 years. No patient required to conversion. The mean operative time was 463 min (range 420 min to 500 min). The mean estimated blood loss was 251 ml (range 100 ml to 450 ml). No patient required blood transfusion. The mean number of lymph nodes harvested were 19. All patient began to intake liquid diet on the post-operative day 1. The mean post-operative hospital stay were 10.2 days. Two patients suffered from pancreatic fistula (Grade A). No patient suffered from post-operative bleeding, portal vein thrombosis, or bile leakage. All patients were followed up at out-patient department. The median follow up period was three months. No recurrence was observed during the follow up period.

**Conclusion:** LPD with major vascular resection using a novel ‘Superior Mesenteric Artery First’ approach were safe and feasible, with favorable peri-operative outcomes.

**Keywords:** Pancreatoduodenectomy, Minimal invasive surgery, Laparoscopic, Vascular resection.
Laparoscopic Common Bile Duct Exploration for Complicated Choledocholithiasis: Technique and Short Term Outcomes from a Single Institution

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Introduction: Laparoscopic common bile duct exploration (CBDE) is increasingly used in the management of complicated choledocholithiasis which previously managed via open techniques. This study aims to evaluate the techniques and short term outcomes of laparoscopic CBDE over a 1.5 year period.

Material and Methods: A retrospective review of records of all patients who underwent laparoscopic CBDE in Changi General Hospital between December 2014 and May 2016 was conducted.

Results: A total of 30 patients with a median age of 74 years (range, 26 to 88) underwent laparoscopic CBDE for choledocholithiasis. 20 patients (66.6%) underwent the trans-cystic approach with the remainder through trans-choledochal approach with primary closure without T tube insertion. Median operating time for trans-cystic and trans-choledochal approach was 200 and 228 minutes respectively (range, 90 to 470 and range, 185 to 360). 18 patients (62%) were diagnosed with choledocholithiasis pre-operatively. 12 patients (70%) had failed ERCP and 5 had documented duct clearance but intra-operative cholangiogram (IOC) detected choledocholithiasis during cholecystectomy. 3 patients had concurrent biliary-enteric fistula which were treated laparoscopically during concurrent CBDE. 12 patients (40%) had incidental choledocholithiasis noted during IOC. There was one conversion to open (3%) for uncertain Calot’s anatomy. Laser lithotripsy was performed for 5 patients for impacted CBD stones. 90% of patients had complete clearance of CBD stones with 3 patients with failed complete clearance using trans-cystic approach. These patients underwent post-operative ERCP with subsequent clearance of stones. 1 patient had post operative ERCP perforation requiring emergency surgery. The median length of hospital stay was 4 days (range 1–24 days) with no postoperative bile leak or 30 day mortality.

Conclusion: Laparoscopic CBDE for complicated choledocholithiasis can be performed with low morbidity and few conversions. For incidental CBD stones, trans-cystic CBDE is the preferred approach. Primary choledochotomy closure is safe and can avoid T-tube and biliary stent related complication.

Keywords: Common bile duct stones, Laparoscopy, Bile duct exploration.

Prevalence of GB Stone/Cholecystitis in Amyotrophic Lateral Sclerosis Patients

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Background/Aims: Amyotrophic lateral sclerosis (ALS) patients have autonomic nerve system impairment and intestinal hyperperistalsis which may lead to gall bladder (GB) poor contractility. The aim of this study was to investigate the prevalence, clinical course, and related factors of GB stone/cholecystitis in ALS patients.

Methods: 1610 patients were diagnosed ALS and 954 patients underwent abdominal ultrasonography (US) or computed tomography (CT) at Hanyang University Hospital between 2002 and 2016. Medical records and US or CT reviewed retrospectively and we evaluated the prevalence, clinical course, and related risk factors of GB stone/cholecystitis.

Result: Overall frequency of biliary disorder in ALS was 9.2% (88/954), the prevalence of GB stone in ALS was 9.12% (87/954) with 65.5% (57/954) in male and the incidence of acute symptomatic GB stone/cholecystitis was 1.78% (17/954). No significant difference was found in rate of tracheostomy ventilator (TV), percutaneous endoscopic gastrostomy (PEG), functional rating scale (FRS), and change of FRS (DFS) between ALS without GB stone and with GB stone. Among the 88 patients, there were asymptomatic GB stone 81.6% (71/88), acute calculous cholecystitis 12.5% (11/88), acute cholangitis with GB & common bile duct (CBD) stone 4.5% (4/88), acute cholangitis with 1’ CBD stone 1.1% (1/88), acute acalculous cholecystitis 1.1% (1/88) and chronic calculous cholecystitis 4.5% (4/88). Among complicated biliary disorder patients, the duration of PEG and TV was associated with symptomatic GB stone/cholecystitis. 0< FRS <30 and DFS >0.73 was increased the incidence of GB stone.

Conclusion: The prevalence of GB stone, the incidence of acute symptomatic GB stone/cholecystitis in ALS was higher than general population. Therefore Some of ALS patients with long-term TV, PEG, FRS <30, and DFS >0.7 should be more carefully assessed and treated on GB stone.

Keywords: Amyotrophic lateral sclerosis, ALS, Gallbladder Stone, Cholecystitis, Cholelithiasis.

Change of the Manner of Closure of the Pancreatic Stump Following Distal Pancreatectomy

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Postoperative pancreatic fistula (POPF) following distal pancreatectomy (DP) is unsolved complication, which may result in mortality. In recent years, we have changed the manner of closure.
of the pancreatic stump to reduce the occurrence and to improve the severity of POPF.

We, herein, present the change of our manner of pancreatic stump closure.

From April 2012 to March 2016, we performed 58 distal pancreatectomies, which include 21 laparoscopic DPs. From Apr 2012 to Sep 2014, we performed hand-sewn and stapling closure. Hand-sewn technique was done in the manner of the mattress suture. In stapling closure, we used ECHELONTM green cartridge. From Oct 2014, we used Endo GIATM reinforced cartridge (black) in all DPs. We reviewed the results of each manner.

We have never experienced mortality during this period. Of 58, we had 26 hand-sewn cases (Group H), and 32 stapled cases. Stapled cases consisted of 18 with ECHELONTM (Group Ec) and 14 with Endo GIATM (Group En). We experienced ‘hard pancreas’ in 2 of H, 1 of Ec, and none of En with no statistical significance. Operating time and blood loss of H and S were 345 min/611 ml and 299 min/355 ml, respectively, with no statistical significance.

Drain amylase concentration on POD1 were 3440 U/L in H, 6768 U/L in Ec and 4631 U/L in En with no statistical significance. POPF Grade B/C according to ISGPF classification was observed in 35% of H and 3% of Ec+En with remarkable statistical significance. We experienced Grade C POPF in Ec, but none in En.

In conclusions, stapling closure could improve the occurrence of POPF following DP. It is difficult to clarify which staple is better by our small experience.

**Keywords:** Distal pancreatectomy, POPF, Staple.

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**PP2-017**

**Identification of Pancreatobiliary Cancer Specific Fusion Genes in Patient Tissues**

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Gene fusion occurs when a part of one gene fuses with or attaches to a part of another gene by genome rearrangement and the result in gene fusion may possess oncogenic properties; fused gene may be translated into a unique protein that may promotes cancer properties. Pancreatic cancer and bile duct cancer are one of the most lethal cancer types with low 5-year survival rates, but lack of proper diagnostic or prognostic markers. Our aim was to investigate pancreatobiliary-specific fusion genes found in patient’s specimens. We used TRIZol to extract total RNA from seven pancreatobiliary cancer tissues and normal tissues from the same patients, and five bile duct cancer tissues and normal tissues from the same patients. Total RNA was assessed for RNA sequencing and the result data was analyzed using ChimeraScan to detect gene fusion. To identify the cancer somatic fusion gene, the fusion occurred in normal tissues and previously reported fusion genes found in normal tissues were excluded and the fusion occurred in coding region was included. As a result, we found 87 pancreatic cancer tissue specific- and 52 bile duct cancer tissue specific-fusion genes. We then selected fusion genes that either one of the gene has been reported to express in cancer tissues. We confirmed the expression of selected fusion genes by RT-PCR in cancer and normal tissues as well as in cancer cell lines. As a result we observed novel pancreatobiliary cancer specific fusion genes. These findings indicate the presence of novel fusion genes as well as its possible application for the early diagnosis or prognosis of pancreatic and bile duct cancer.

**Keywords:** Fusion gene, Pancreatobiliary cancer.

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**PP2-018**

**Short Term Outcomes of Billiary Enteric Anastomosis Comparison for Different Indications in a Teaching Tertiary Hospital Over Two Years**

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**Background:** There are different types biliary enteric anastomosis done with literatures preferring one over the other for different reasons. This study is conducted to compare and see the outcomes of the commonly done biliary enteric bypass surgeries namely choledochoduodenostomy, cholecdojejunostomy, hepaticojejunostomy, and choledochojejunosstomy.

**Methods:** All patients admitted and operated in the duration of January 1 2013 up to December 31 2014 are included and chart review done retrospectively to fill out a preformed questionnaire and the data analyzed using 10.1 SPSS data processor.

**Results:** 39 patients were operated in the duration Out of these 28 (71.8%) were females and 11 (28.2%) were males. 18 (46.2%) were in the age group 50–70 years and 14 patients age between 30–50 years. Over all 12 (30.7%) patient had postoperative complication 8 (20.5%) wound infections, three (7.7%) biliary leaks and one sepsis of pulmonary origin. All 19 cases of choledochoduodenostomies, had no biliary leak but 3 (15.8%) had wound infection. 7 cases of choledochojejunostomies complicated with 2 (28.5%) wound infection. Seven cholecystojejunostomies done and there were two (28.8%) cases of wound infection and two cases (28.8%) of temporary billiary leak. Six patients had hepaticojejunostomy of which one patient (16.7%) had wound infection, one patient (16.7%) had transient biliary leak.

**Conclusion:** Though the number of patients are small to induce deduction according to this study there is no statistically significant different in the immediate outcome of patients operated with all four types of biliary enteric anastomosis. It needs a bigger and randomized well planed study to come to a certain conclusion.

**Keywords:** Hepaticojejunostomy, Cholecodojejunostomy, Choledochooduodenostomy, Cholecystojejunosstomy, Biliary enteric anastomosis.
**PP2-019**

**Pancreaticojejunostomy Using a Technique of Invagination Anastomosis (End-to-Side Anastomosis) without Stenting for Soft Pancreas**

Ikuko Watanobe, Masaya Kawai, Shozo Miyano, Tajiros Kosaka, Michio Machida, Toshiaki Kitabatake, Hiroyuki Sugo, Yoshifumi Lee, Kuniaki Kojima

**Background:** We present a pancreaticojejunostomy technique of invagination anastomosis (end-to-side anastomosis) without stenting for soft pancreas. This technique is very rare in Japan.

**Methods:** This study included 35 patients, 22 men and 13 women, average age 65.3 years, who underwent pancreaticoduodenectomy for soft pancreas at our hospital. We determined the soft pancreas as under 2 mm diameter of main pancreatic duct. Invaginated endo-to-side pancreaticojejunostomy was performed for all patients without stenting. In the first place, the outer layer encompasses the posterior wall of the remnant pancreas and the jejunal seromuscularis separately using 3-0 non-absorbable sutures. The inner layer encompasses the capsular parenchyma of the pancreas and the jejunum through all layers of the bowel continuously using 4-0 absorbable sutures. Postoperative pancreatic fistula (POPF) was evaluated using an international study group (ISGPF) definition.

**Results:** There was no mortality in any of the 35 patients. Eleven patients (31.4%) did not develop POPF, and 24 patients (68.6%) developed POPF; grade A: 20 (57.1%), grade B: 4 (11.4%). But all of the POPF patients healed with conservative therapy. The average post operative stay was 29.5 days and 20.8 days in the no POPF patients, 32.8 days in the grade A patients, 36.8 days in the grade B patients. None of the patients developed postoperative intra-abdominal bleeding and abscess. One patients developed delayed gastric emptying.

**Conclusion:** The incidence of fistula has been considerably decreased by the technique of invagination anastomosis (end-to-side anastomosis) without stenting. This technique is safe and easy for young surgeons compare with duct-to-mucosa anastomosis.

**Keywords:** Pancreaticojejunostomy, No stent, Invagination anastomosis.

**PP2-020**

**To Present our Clinical Experience with Gall Bladder Perforation Cases**

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**Aim:** To present our clinical experience with gall bladder perforation cases.

**Methods:** Records of 480 patients who received medical and/or surgical treatment with the diagnosis of cholecystitis in our hospital between 2007 and 2014 were reviewed retrospectively. 29 (6%) of those patients had gall bladder perforation. Original Niemeier’s classification of gall bladder perforation was used to describe the type of perforation. Parameters including age, gender, duration of symptoms, fever, leucocytosis, diagnostic procedures, medical or surgical or radiological interventional treatment used, morbidity and mortality were evaluated in all the above included cases.

**Results:** Out of the 29 patients, 25 patients had subacute type of gall bladder perforation (Niemeier type II) and 4 patients had chronic (Niemeier type III) perforation. None of the patients had Niemeier type I perforation. The diagnosis in all these patients was established on admission to the hospital by means of abdominal ultrasound and computed tomography. Twelve (43%) patients underwent early surgery. The rest (56.8%) either underwent conservative medical line of management or pigtail catheter insertion in the collection followed by interval cholecystectomy. In the presented series three (10.7%) patients died of sepsis and associated comorbidities.

**Conclusion:** Early diagnosis of gall bladder perforation is of critical importance. Abdominal ultrasound is the primary modality while computerized tomography is the gold standard for diagnosing gall bladder perforation. Type III perforation, are difficult to be detected by USG. Management strategies include early surgery in patients with generalized peritonitis or suspicion of gall bladder necrosis, and initial conservative line of management and/or pigtail insertion in surgically high risk patients which can be followed up by interval cholecystectomy.

**Keywords:** Acute cholecystitis, Gall bladder perforation, Early diagnosis, Early surgery, Pigtail.

**PP2-021**

**Predictive Factors of Pancreatic Fistula and Postoperative Complication after Pancreaticoduodenectomy**

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**Background/Aim:** Postoperative pancreatic fistula (PF) remains a potentially fatal complication after pancreaticoduodenectomy (PD). The aim of this study is to investigate the clinical predictive factors of postoperative pancreatic fistula (PF) (ISGPF grade B and more) and complications (Clavien-Dindo classification more than grade 3) after PD.

**Methods:** The study included 112 consecutive patients of PD with lymph node dissection between 2005 and 2015. We analyzed by following clinical factors and PF, other postoperative complications. The clinical factors were as follows. 1) age: £70 years,<70 years 2) high risk past history and/or comorbidities: Yes/No 3) BMI: £25/<25 4) HbA1c: £7.5%/<7.5% 5) Onodera index: <40/<40 6) GL ratio: £3.0/<3.0 7) Operation time:£8 hours/<8 hours 8) pancreas texture: soft/hard 9) pancreatic duct diameter:
HbA1c 8 hours. If the diameter of the pancreatic duct is less than 3 mm, operation time is more than management is required in case of soft pancreas texture, diameter of pancreatic duct is less than 3 mm, operation time is more than 8 hours.

**Keywords:** Pancreaticoduodenectomy, Postoperative pancreatic fistula, ISPGF, Clavien-Dindo classification.

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**PP2-022**

**Flavokawain B, a Kava Chalcone, Inhibits Growth of Human Pancreatic Cancer Cells through G2/M Cell Cycle Arrest and Apoptosis**

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**Background/Aims:** Flavokawain B (FKB) is a kava extract possessing therapeutic potential against several cancers. However, the antitumor effect of this natural compound on pancreatic cancer has not been determined yet. This study was designed to identify antitumor activity and molecular mechanisms of FKB in pancreatic cancer cell lines. Finally, we investigated whether the combination of FKB and gemcitabine had an additional therapeutic effect compared to gemcitabine single regimen in pancreatic cancer cell lines.

**Method:** Pancreatic cancer cell line were cultured and treated with different concentrations of FKB. Cell viability was determined by MTT assays and the IC50 was estimated. Fluorescent-activated cell sorting analysis of apoptosis and cell cycle was performed. Real-time RT-PCR and western blot analysis were utilized to evaluate differences in the expression of apoptotic markers.

**Result:** FKB caused the G2/M cell cycle arrest of pancreatic cancer cells that was mediated through reductions in the levels of cyclin D1 and cyclin-dependent kinase 4. FKB also induced apoptosis through the down-regulation of Bcl-2 with the activation of apoptotic proteins, including Bax and Bak in pancreatic cancer cell lines. The G2/M cell cycle arrest and apoptosis in combination treatment was significantly higher than that in FKB or gemcitabine single treatment (P < 0.05).

**Conclusion:** Our results suggest the antitumor potential of FKB for the prevention and treatment of pancreatic cancer. In addition, the combination of FKB to gemcitabine enhanced antitumor efficacy through cell cycle arrest and apoptosis in pancreatic cancer.

**Keywords:** Flavokawain B, Pancreatic cancer.

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**PP2-023**

**Various Technics of Vessel Interposition for Advanced Pancreas Cancer**

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**Introduction:** Pancreas cancer is one of the most lethal malignancies with poor survival. Only curative option is aggressive surgery. But, this surgical resection is very difficult to cancer with vascular invasion. The most important indication for vascular resection in patients with pancreatic cancer is the ability to obtain cancer-free surgical margins. Otherwise, vascular resection is contraindicated. Extended lymphadenectomy may be not of benefit. An aggressive approach for stage II pancreatic cancers with venous or arterial invasion can be performed with comparable results when it is executed by an experienced institution with skilled oncologic and vascular surgeons. There a few report for the advanced pancreatic cancer with T4. In our study we report our institutional experience with the use of various vessel interposition techniques for advanced pancreatic cancer with major vessel invasion.

**Method:** A retrospective review was performed for patients undergoing a Whipple operation, PPPD and distal pancreatectomy during 4 years from March 2012. During 4 years, 19 patient was performed by vessel reconstruction method.

**Result:** During the 4-years, 11 cases of vessel interposition was performed. Vessel interposition techniques include portal vein resection and reconstruction (PVRR), PVRR and Rt. Hepatic artery (RHA) resection and reconstruction by gastroduodenal artery (GDA), PVRR and RHA resection and reconstruction by common hepatic artery (CHA), PVRR with second superior mesenteric vein (SMV) reconstruction, PVRR and CHA resection and reconstruction by Lt. gastric artery, superior mesenteric artery (SMA) reconstruction by goretex graft and Appleby operation c aorto – CHA bypass.

**Conclusion:** R0 resection could be achieved by various vessel interposition technique for T3~T4 lesion.

**Keywords:** Advanced pancreas cancer, Uncinate, Vessel interposition.
PP2-024

Treatment Strategies for Post-Operative Complication after Pancreaticoduodenectomy to Archive Zero Mortality

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Background/Aims: In spite of advances in surgical techniques and perioperative management, the morbidity rates after pancreaticoduodenectomy (PD) has been range from 30 to 40%. Moreover, the mortality after PD remains 1–3%. To archive zero mortality after PD, management of severe postoperative complication is important. The aim of this study was to review the outcome of PD, and causes and treatment strategies of severe postoperative complication.

Methods: We performed PD followed by a modified Child’s reconstruction with pancreatico-jejunostomy. Clinical course and postoperative complications were retrospectively evaluated.

Results: From 2009, we performed 180 consecutive PD, including 108 male and 62 female with median age of 69 (18–87) years old. Of these patients, 147 cases (81.6%) had malignant disease such as pancreatic and bile duct cancer. Super mesenteric vein – portal vein resection and reconstruction was performed in 22 patients (12.2%). Five cases (2.8%) of hepato-pancreatoduodenectomy was included in this study. Median operative time of the whole patients was 452 (291–869) min, and median operative bleeding was 635 (44–3875) g. Localized anastomotic leakage or abscess were treated by persistent drainage using drainage tubes which were placed during operation, or additional drainage (Clavien-Dindo, CD IIIa). However, when these drainages were not effective, we performed early reoperation to create reliable drainage tubes during operation, or additional drainage (Clavien-Dindo, CD IIIa). Important complication occurred in 14 cases (7.8%), and CD IV in 2 cases (1.1%). Importantly, we have archived zero mortality in these consecutive patients. One of CD IV patients received reoperation for peritonitis, followed by prolonged mechanical ventilation. Another CD IV patient, 83 years old, developed aspiration pneumoniae which needed mechanical ventilation in ICU.

Conclusion: We have archived zero mortality in consecutive 180 PDs. The morbidity rates after PD has been still high. Immediate treatment and appropriate management of severe postoperative complication is important.

Keywords: Pancreaticoduodenectomy, Complication, Clavien-Dindo scale.

PP2-025

Prognostic Value of p21-Activated Kinase 4 (PAK4) in Resected Pancreatic Cancer

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Purpose: Resectable pancreatic cancer has poor prognosis, with a high recurrence rate after curative surgery; biomarkers are needed for distinguishing patients who may benefit from curative resection. In this study, we sought to analyze the prognostic value of p21-activated kinase 1 (PAK1), p21-activated kinase 4 (PAK4), human equilibrative nucleoside transporter 1 (hENT1) and thymidylate synthase (TS) in a single institutional cohort of surgically resected pancreatic ductal adenocarcinomas.

Patients and Methods: A total of 160 pancreatic cancer patients who underwent surgery with a curative intent between June 2003 and May 2012 in Seoul National University Bundang Hospital were retrospectively reviewed. Tissue microarrays were constructed and immunohistochemical stains were performed for PAK1, PAK4, hENT1 and TS.

Results: The absence of PAK4 expression in pancreatic adenocarcinomas was associated with poorer histologic differentiation (P < 0.001), shorter overall survival (hazard ratio [HR] = 2.86, 95% confidence interval [CI] 1.43–5.71; P = 0.003) and disease-free survival (HR = 2.29, 95% CI 1.11–4.74; P = 0.025) on univariable analyses. In addition, more frequent venous invasion and lymph node metastases were seen in PAK4-negative tumors although not statistically significant. PAK1, hENT1 and TS expression status did not have significant influences on patient survival.

Conclusion: Of the markers tested in this study, PAK4 may be a potential predictive biomarker for pancreatic adenocarcinomas, and immunohistochemistry for PAK4 may be valuable for identifying more favorable subsets of pancreatic cancer patients.

Keywords: PAK4 protein, Human, hENT1 protein, Thymidylate, Synthase, PAK1 kinase, Pancreatic neoplasms

PP2-026

Detection of Circulating Tumor Cells in Pancreatic Cancer Patients

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Background: The prognosis of pancreatic ductal adenocarcinoma (PDAC) patients is poor and circulating tumor cell (CTC) has been used as a promising tool for predicting long-term out-
comes. However, the use of CTCs in PDAC patients has caused considerable controversy.

**Method:** Totally 115 patients including 95 PDAC patients and 20 patients with benign pancreatic tumors were enrolled in this retrospective study. The Cytelle system was utilized to enumerate CTCs in 3.2 ml of blood. Negative selection strategies were implemented to achieve more specific enrichment of CTCs. The cutoff value was set as 2 cells/3.2 ml. CTCs ≥2 cells/3.2 ml were defined as CTC positivity.

**Result:** Together 67 PDAC patients (67/95, 70.5%) and 4 non-malignant patients (4/20, 20%) were detected CTCs-positive (sensitivity: 70.5%, specificity: 80.0%). Totally 87 PDAC (87/95, 91.6%) patients and 4 non-malignant patients (4/20, 20%) were detected CA19-9 positivity and/or CTC positivity. Parallel combination of both CA19-9 and CTCs had a higher sensitivity (91.6%). Blood CTC levels had no relationship with age, gender, tumor size (P > 0.05). However, CTC positivity was associated with poor tumor stage (P = 0.011). Moreover CTCs of 14 PDAC patients were followed multiple tested after radical resection. We found that the fluctuations of both CTCs numbers and serum CA19-9 levels were contemporary.

**Conclusion:** Negative selection strategies for CTCs are efficient. CTC positvity is associated with late tumor stage. CTC might be a useful tool for predicting outcomes in PDAC patients.

**Keywords:** Pancreatic ductal adenocarcinoma, Circulating tumor cell, Diagnosis, Prognosis, Tumor stage.

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**PP2-027**

**Improved Survival Outcomes after Resection of Ductal Adenocarcinoma in the Body and Tail of the Pancreas: A Single Center 10 Years’ Experience**

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**Background/Aim:** The prognosis of pancreatic ductal adenocarcinoma (PDAC) arising from the pancreatic body and tail was known to be worse than that of PDAC arising from the pancreas head. Although recent advances in pancreatic resection and perioperative chemotherapy have improved therapeutic outcome for PDAC, there have been few reports focusing on survival outcomes after surgery for pancreatic body and tail cancer. We analyzed our 10-year experiences of surgical treatment for PDAC of the body and tail to evaluate the survival outcome after surgery.

**Methods:** A total of 86 patients with PDAC of the body and tail who underwent distal pancreatectomy between January 2003 and December 2014 were evaluated for survival, recurrence and prognostic factors affecting survival after surgery.

**Results:** Curative resection was possible in 75 (87.2%) patients. Combined resection, including celiac axis, portal vein and adjacent organs, were performed in 30 (34.9%) patients. Neoadjuvant therapy was carried out in 10 patients with locally advanced cancer. The mean follow-up duration after surgery was 25.8 months. The median survival duration of all patients was 28.9 months. The 5-year overall and disease-free survival rate was 35.1% and 22.7%, respectively. Recurrence was detected in 54 (62.7%) patients. In the univariate analyses for survival, perineural invasion (P = 0.030), absence of adjuvant chemotherapy (P = 0.034) and incompletion of adjuvant chemotherapy (P = 0.019) were significantly associated with decreased survival. Multivariate analysis revealed that perineural invasion (HR 4.68, 95% CI 1.38–15.83, P = 0.013) and adjuvant chemotherapy (HR 0.36, 95% CI 0.19–0.71, P = 0.003) were independent prognostic factors for survival.

**Conclusions:** The results suggest that aggressive treatment, including combined resection and perioperative chemotherapy, improved the survival outcome in patients with resected PDAC of the pancreas body and tail. Further study with larger number of patients and longer follow-up period is needed to confirm the survival improvements of these patients.

**Keywords:** Pancreatic body and tail cancer.

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**PP2-028**

**Predicting Factors for Unresectability in Patients with Localized Pancreatic Cancer and Selective Use of Staging Laparoscopy**

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**Background:** The prognosis for pancreatic cancer patients is very poor. At the time of pancreatic cancer diagnosis, only 15–20% of patients have a potentially resectable disease without evidence of a major vessel involvement or extrapancreatic spread of the tumor. Despite the advances and resolution improvement of imaging technologies, Surgeons sometimes encounter distant metastases intraoperatively, including tiny liver metastases or a small amount of peritoneal metastases. The aim of the present study was to identify the predicting factors for unresectability and to evaluate who should receive staging laparoscopy for distant metastasis and locally advanced unresectability in pancreatic cancer patients.

**Methods:** From 2006 to 2015, we retrospectively reviewed the medical records of 470 patients who diagnosed with pancreatic cancer and underwent open laparotomy at Severance Hospital, Seoul, South Korea. Information on age, sex, CA 19-9, total bilirubin, albumin, cholesterol, body mass index, tumor size, tumor location, intraoperative finding were collected.

**Results:** Of the 470 patients who underwent open laparotomy, 32 (6.8%) patients were unresectability status on intraoperative finding and underwent open & closure or palliative bypass surgery. The tumor size and CA 19-9 in unresectable group were significantly larger than that in the resectable group. After matching by age and sex, multivariate analysis showed that tumor size was independent predicting factor for unresectability and to evaluate who should receive staging laparoscopy for distant metastasis and locally advanced unresectability in pancreatic cancer patients.

**Conclusions:** The presence of high-risk markers was associated with surgical unresectability in patients with radiographically resectable pancreatic cancer. The selective use of staging laparoscopy in patients high risk factors may decrease the frequency of unnecessary laparotomy in pancreatic cancer patient.
Comparison of the Diagnostic Accuracy between Base and Cover Slide Smear after EUS-FNA for Pancreatic Cancer

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Background: Endoscopic ultrasound guided fine needle aspiration (EUS-FNA) has played an important role in diagnosing pancreatic cancer. The aim of this prospective single blind study is to compare the cellular characteristics and diagnostic accuracy between base and cover slides to find a clue for optimal cytopathologic process without on-site pathologist.

Method: For the patients who have been suspected to have pancreatic cancer in previous imaging studies, one endoscopist performed EUS-FNA and gets total 8 pairs of slides (8 covers + 8 bases), one bottle of cell-block, and one bottle of biopsy. The cover and base slide sets were randomly assigned to two bottles. A pancreas-special pathologist blindly inspected all the four bottles and reported results.

Results: A total of 73 patients’ results were acquired for the final analysis. The target sites were 42 (58%) of head, 16 (22%) of body and 15 (20%) of tail, respectively. Among 73 patients, 71 (97%) patients were finally diagnosed with pancreatic cancer. The sensitivity, specificity, and diagnostic accuracy of overall EUS-FNA was 93%, 100%, and 93.15%, respectively. Cytologic smear (85%) and biopsy (89%) showed higher sensitivity than cell block (45%) (P < 0.001). In diagnosing malignancy, the consistent results of base and cover slides were in 66 cases (90%), and seven cases was positive only in one slide set (4 of base, 3 of cover). Fifty five (75%) of slides set showed high cellularity (≥10 clusters/nests per slide), and average five among eight slides were informative to diagnose.

Conclusion: Without an on-site cytopathologist, 93% of suspicious pancreatic cancer patients were finally diagnosed with pancreatic cancer on EUS-FNA. In cytologic smear of EUS-FNA, cover and base slide showed high consistency in cellular characteristics and diagnostic accuracy. However, although one slide set shows negative result, pathologists cannot ignore other slide set.

Keywords: EUS-FNA, Pancreatic cancer, Biopsy, Cytology, Cell-block.

Optimal Threshold Level of ‘Relative Dose Intensity’ of FOLFIRINOX in Advanced Pancreatic Cancer: Using Modified Hryniuk’s Model

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Introduction: Since FOLFIRINOX improved efficacy but also increased toxicity, several reports have been published about modified FOLFIRINOX as a concept of dose reduction. However, the lower limit of dose reduction is still unclear. The aim of this study is to find the minimal relative dose intensity (RDI, %) of FOLFIRINOX that can be expected to ensure tumor response in advanced pancreatic ductal adenocarcinoma (PDA).

Methods: A total of 201 PDA patients treated with FOLFIRINOX as first line therapy were retrospectively reviewed. Based on Hryniuk’s model, we established a modified Hryniuk’s model and launched a web-based calculator (http://www.rdicalc.com). Using receiver operator characteristic (ROC) curve, we investigated minimal RDI with a view to obtaining tumor response and disease control. The toxicity profile was also described in the same way.

Results: Among eligible patients, 133 patients completed the initial treatment until the first radiological evaluation with median 3 cycles and 58 days. Forty eight patients had locally advanced PDA and 85 had metastatic PDA. The basic characteristics of two groups did not showed significant difference except cancer antigen 19-9 (CA19-9) level and primary tumor site. As the minimal effective thresholds, the ROC curve showed 71.2% RDI for tumor response (81.6% sensitivity, 64.3% specificity) and 55.3% RDI for disease control (60.9% sensitivity, 92.7% specificity). Among the 145 patients including early dropout patients due to toxicity, grade III/IV neutropenia, febrile neutropenia (FN) and vomiting was 47%, 14% and 23%, respectively. Without prophylactic G-CSF, above 80% RDI showed significantly high rate of febrile neutropenia (P = 0.025).

Conclusion: Using modified Hryniuk’s model, the minimal RDI to expect tumor response and disease control of FOLFIRINOX in advanced PDA was 70% and 55%, respectively. Therefore, we would suggest 70 to 80% of FOLFIRINOX in advanced PC could guarantee tumor response with decreased risk of FN.

Keywords: Pancreatic cancer, FOLFIRINOX, Relative dose intensity, Modified hryniuk model.
**PP2-031**

**Preoperative Parameters That Predict Early Recurrence for Left Sided Pancreatic Cancer**

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**Purpose:** The prognosis of pancreatic adenocarcinoma is poor. The aim of this study is to identify preoperative prognostic factors and to select patients who undergo unnecessary surgical resection.

**Methods:** From January 1996 to December 2013, 77 medical records of the patients were retrospectively reviewed, who underwent distal pancreatectomy for left-sided pancreatic cancer at Yonsei Medical Center, Seoul, Korea. The patients were divided into two groups by disease free survival (<6 months vs. ≥6 months) and evaluated preoperative prognostic factors. After that, selecting the preoperative prognostic factors, univariate and multivariate analyses were done to identify preoperative prognostic factors.

**Results:** In univariate analysis, tumor size (Early recurrence vs. Late or Not recurrence: 3.8 ± 0.4 cm vs. 2.7 ± 0.2 cm, p = 0.005) and Celiac axis distance (<400 U/ml vs. ≥400 U/ml: 1.8 ± 0.4 cm vs. 2.9 ± 0.3 cm, p = 0.039) had significant difference between two groups. In multivariate analysis, tumor size had statistical impact on prediction of early recurrence. (Exp (β) = 3.31, p = 0.046, cut-off value 2.9 cm) However, celiac axis distance only showed marginal significant. (Exp (β) = 2.61, p = 0.091, cut-off value 1.6 cm).

**Conclusion:** Left-sided pancreatic adenocarcinoma candidates for distal pancreatectomy should consider early recurrence risk to avoid unnecessary surgical resection. These preoperative prognostic factors can identify patients for whom alternative management.

**Keywords:** Pancreatic cancer, Parameter, Recurrence, Survival.

**PP2-032**

**What Is the Role of Chemoradiation in Patients with Locally Advanced Pancreatic Adenocarcinoma?**

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**Background:** Chemoradiation in pancreatic cancer in the adjuvant setting can improve local control. The aim of this study was to establish the role of chemo-radiotherapy in locally advanced pancreatic adenocarcinoma.

**Patients and Methods:** Medical files of 43 patients with confirmed locally advanced pancreatic adenocarcinoma who presented to our centre between 2000–2014 were retrospectively reviewed. Multimodality treatment consisting of surgery, chemo-radiotherapy or chemotherapy alone was planned according to tumour extent and performance status of the patient.

**Results:** Demographic characteristics showed a higher incidence in men (62.8%) and median age at diagnosis was 59.3 (range 45–82). The tumour was localised in the cephalic region in 88.4% of cases. Therapeutic sequence was surgery followed by adjuvant chemotherapy in 69.8% of patients and 27 patients (62.8%) received concurrent chemo-radiotherapy. Neoadjuvant chemotherapy was administered in 13 patients (30.2%). After combined treatment, surgery with radical intent was possible in 21 patients (15.9%). After a median follow up of 19.9 months, median overall survival (OS) for the population was 18.5 months, with one year survival rate of 85% and 2 year survival of 46%.

Radio chemotherapy improved median survival (21 vs. 19 months p = 0.056), even if the patient had lymph node involvement. Overall survival was better if after surgery adjuvant chemo-

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**Fig. 1.** Interval disease free survival (IDFS) rate according to treatment modality (for Abstract PP2-031).
therapy was administered (19 vs. 13 months p = 0.003). Adjuvant chemotherapy consisted of gemcitabine regimen in 81.4% and 5-fluorouracil and leucovorin in 18.6%. In our series gemcitabine based chemotherapy was better than 5-Fluorouracil (19 vs. 14 months). Neoadjuvant chemotherapy was not able to improve overall survival if the patient were not converted to surgery.

**Conclusions:** Multimodality treatment in locally advanced pancreatic cancers (surgery, concurrent radio-chemotherapy and adjuvant chemotherapy) can improve outcome of patients with locally advance pancreatic cancer.

**Keywords:** Chemoradiation.

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**PP2-034**

**Validation of Perioperative and Long-Term Outcomes after Pancreatocoduodenectomy in Patients 80 Years or Older: A Retrospective Cohort Study**

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**Background/Aims:** Pancreatocoduodenectomy has been regarded as a safe surgical procedure at high-volume centers, the perioperative mortality rate of pancreatocoduodenectomy is 1 to 2%. However the postoperative morbidity rate remains relatively high at 20 to 50%. Previous studies have shown that pancreatic resection can be safely performed even in the selected patients aged 80 years and over, but the patient’s selection criteria is controversial. First aim of this study is to evaluate the perioperative and long-term outcomes following pancreatocoduodenectomy in octogenarian patients and to compare the results with those of septuagenarian. Second aim is to validate our predetermined indication of pancreatocoduodenectomy for elderly patients using the risk model of modified Estimation of Physiologic Ability and Surgical Stress (modified E-PASS).

**Methods:** A total 222 consecutive patients undergoing pancreatocoduodenectomy between 1990 and 2015 were retrospectively examined. The octogenarian patients (n = 30) were compared with septuagenarian patients (n = 192) in terms of baseline, clinical characteristics, operating data, postoperative morbidity and mortality, long-term outcome, and validate our predetermined indication of pancreatocoduodenectomy for elderly patients using the risk model of modified E-PASS.

**Results:** There were no significant differences between two groups in morbidity (p = 0.402) and in mortality rates (p = 0.932). In the multivariate analysis, pancreatic cancer (p = 0.042) and blood loss (p = 0.040) were independent poor prognostic factors. The incidence of postoperative morbidity was significantly positively correlated with comprehensive risk score fixed (CRSf) (p = 0.009). ROC analysis in modified E-PASS revealed a significant association between postoperative morbidity and CRSf (AUC 0.702, p < 0.0001).

**Conclusion:** We concluded that our indication of pancreatocoduodenectomy is properly validated. Modified E-PASS may help identify and counsel high-risk elderly patients, support the benefits of therapeutic decisions. With only properly patients’ selection and prudent perioperative management, elderly patients 80 years or older will have achievable long-term outcome despite the higher incidence of postoperative morbidity.

**Keywords:** Pancreatocoduodenectomy, Elderly patients, Complication, Pancreatic cancer, Biliary cancer, Periampullaly cancer.
Clinical Benefits of Neoadjuvant Chemoradiotherapy for Adenocarcinoma of the Pancreatic Head: An Observational Study Using Inverse Probability of Treatment Weighting

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Background: The efficacy of neoadjuvant chemoradiotherapy (NACRT) and subset of pancreatic ductal adenocarcinoma (PDAC) patients who are most likely to benefit from this strategy remain elusive. The aim of this study was to investigate the effects of NACRT in patients with resectable (R) or borderline resectable (BR) adenocarcinoma of the pancreatic head. BR diseases were classified into two groups: lesions involving exclusively the portal vein system (BR-PV) and those abutting the major artery (BR-A).

Methods: A total of 504 patients treated with curative intent for PDAC were analyzed. Patients who underwent upfront surgery and those who underwent NACRT followed by surgery were compared using propensity score-matched and inverse probability of treatment-weighted analyses (UMIN000019719).

Results: No significant differences were noted in the incidences of curative resection among the three categories (R, n = 273; BR-PV, n = 129; BR-A, n = 102). Propensity score-weighted logistic regression analysis revealed that the incidence of pathological lymph node metastasis was significantly reduced in the NACRT group in all three categories, but the incidence of pathologically positive resection margins was reduced by NACRT only for the BR patients. Among the propensity score-matched patients, NACRT rather than upfront surgery significantly prolonged the median survival time of BR-PV patients (28.4 vs. 20.1 months; P = 0.044) but not that of R-PDAC patients (28.6 vs. 33.7 months; P = 0.960). NACRT prolonged the median survival time of BR-A patients (18.1 vs. 10.0 months; P = 0.046), but the results remained unsatisfactory.

Conclusions: These findings suggest that NACRT improves R0 rates and increases the survival of patients with BR-PV adenocarcinoma of the pancreatic head but not that of patients with R-PDAC. NACRT for BR-A patients brought significant downstaging such as reducing pathological lymph node metastasis and positive resection margins, but it is controversial whether surgery influence the improvement of prognosis.

Keywords: Pancreatic ductal adenocarcinoma, Borderline resectable, Neoadjuvant chemoradiotherapy, Upfront surgery, Portal vein.
metastases); Group L (liver metastasis); Group LA (without any distant metastasis). Clinical backgrounds and courses were compared among groups, and risk factors for peritoneal metastasis were investigated.

Results: There were 25 patients in CY group, 21 patients in P group, 16 patients in L group, and only 48 patients (43.6%) in LA group. The rate of PDAC located at pancreatic body or tail (Pbt) in P group was significantly higher than in other groups (p = 0.037), and pre-operative CA19-9 in L group was significantly higher than in other groups (p = 0.011). Univariate and multivariate analyses showed that Pbt and tumor diameter more than 42 mm were significantly independent risk factors for presence of peritoneal metastasis. (Odds ratio (95% CI)/p factor Pbt: 2.49 (1.13–5.61)/0.023, tumor >42 mm: 2.26 (1.02–5.09)/0.044).

Conclusion: Staging laparoscopy stands at an important position for diagnosing peritoneal metastasis indicated that more than half of patients had occult distant organ metastasis in patients with RD-LA PDAC. Tumor location at Pbt and tumor size >42 mm were risk factors for presence of peritoneal metastasis.

Keywords: Staging laparoscopy, RD-LA, Peritoneal metastasis.

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PP2-038
Risk Factors of Recurrence in Right Colonic Diverticulitis

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Background: Right colonic diverticulitis (RCD) is more common in Asian countries than Western countries and its risk factor for recurrence is poorly studied. This study aim to find the risk factors of recurrence in right colonic diverticulitis.

Method: We reviewed 298 patients admitted for RCD in Gachon university Gil medical center from December 2001 to October 2014. Age, gender, BMI, History of alcohol drinking, smoking, hypertension, diabetes, obesity, number of diverticulum, hospital stay, and complication were evaluated as candidate for risk factors influenced on recurrence.

Result: Of the 298 patients with RCD, 31 patients recurred after conservative treatment. When patients stayed in hospital longer at the first attack, recurrence rate was much higher (p = 0.005). Recurrence rate of patients who drinking alcohol were significantly higher than non-alcoholic patients (p = 0.019). Smoking also was higher in the recurrence group (p = 0.001). Interestingly, recurrence rate of patients with hypertension was lower than those with normal blood pressure, but statistically not significant (p = 0.081).

Conclusion: History of alcohol drinking, smoking, and duration of hospital stay were positively related to recurrence.

Keywords: Diverticulitis, Recurrence, Risk factor.

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PP2-039
Cold Forceps Polypectomy and Grasping Hemostasis Using Jumbo Biopsy Forceps for Diminutive Polyps in the Colon

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Background and Aims: Diminutive adenomas less than 5 mm in size are sometimes observed by colonoscopy. In order to achieve a clean colon, they are likely to be removed. Cold forceps polypectomy (CFP), using jumbo biopsy forceps, we have resected diminutive colorectal polyps and evaluated the technique and safety of the procedure.

Materials and Methods: From January 2008, we retrospectively reviewed the cold forceps polypectomy cases of 603 patients with 942 diminutive polyps (most of them under 5 mm) without malignant findings in the colorectum. We used Radial Jaw 4 Jumbo Biopsy Forceps (Boston Scientific, Marlborough, MA, USA). Since the jumbo biopsy is very wide when the forceps is fully open both sides of the mucosa are stripped, while the center sometimes remains behind. Therefore, we partially opened the jumbo biopsy forceps, adjusted to the polyp diameter, and took the polyp in the cavity of the forceps. If the diameter of the polyp was smaller than the outer diameter of the jaw (under 2.8 mm), we tried to resect it in one operation. If the polyp was larger than the outer diameter of the jaw, but less than twice the jaw diameter (approximately 2.8 mm – 5 mm), we tried to resect it in two operations. In cases of prolonged bleeding, we grasped the whole resection area with the jumbo biopsy forceps until hemostasis.

Result: All polyps were resected. No perforation and no post-polypectomy bleeding were observed. Grasping hemostasis with jumbo biopsy forceps was performed 32 times, in all cases bleeding was stopped after 15–30 seconds of grasping.

Conclusions: Cold forceps polypectomy and grasping hemostasis using jumbo biopsy forceps is a simple and safe technique.

Keywords: Cold forceps polypectomy.

PP2-040
The Efficacy of Postoperative Adalimumab Maintenance Therapy in Japanese Patients with Crohn’s Disease


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Background/Aims: Approximately 70–80% of patients with Crohn’s disease (CD) require surgery for complications, and the rate of postoperative recurrence is an unacceptable 88%. The aim of this study was to investigate the efficacy and safety of planned adalimumab (ADA) maintenance therapy after surgical resection of bowel lesions of Japanese patients with CD.

Abstracts
Intussusception is uncommon in adults and few general surgeons see even one case in their surgical career. Despite the rarity of adult intussusception, surgeons need to be familiar with the possible surgical options.

**Methods:** Twenty-six patients with CD undergoing surgical resection were enrolled. All patients received subcutaneous injections of ADA 160/80 mg at 0 and 2 weeks, followed by 40 mg every 2 weeks. The primary endpoint of this study was the incidence of endoscopic recurrence, defined by Rutgeerts endoscopic recurrence scale ≥i2, at 1 year after surgery. Secondary objectives included the incidence of clinical recurrence at 1 year after surgery, defined by clinical recurrence was a CD Activity Index (CDAI) score >150, time-to-treatment failure (TTF), and safety.

**Results:** At the median follow-up period of 41 months, the median number of treatments with ADA was 56 times and the median TTF was 26 months. Endoscopic recurrence was observed in 35% of patients 1 year after surgery. Univariate analyses show that preoperative ADA therapy was significantly associated with endoscopic recurrence. 17% of patients experienced clinical recurrence 1 year after surgery. Secondary surgery for recurrence was not required. Although adverse events (≥grade 3) were experienced by 15% of patients, none was withdrawn from this study.

**Conclusion:** Planned postoperative ADA therapy reduced the incidence of endoscopic and clinical recurrence after bowel resection of Japanese patients with CD.

**Keywords:** Crohn’s disease, Adalimumab.

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**PP2-041**

**Colo-Colic Intussusception**

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**Introduction:** It is defined as protrusion of the proximal segment into the distal segment of gut lumen. It is very much common in children but in adults it is mainly due to some organic cause. It presents as acute abdomen. Intussusception remains a rare condition in adults, representing 1–5% of bowel obstruction and accounting for 0.003–0.02% of all hospital admissions. Intussusception occurs more frequently in the small (50–80%) than in the large bowel (12–50%). It is estimated that approximately 90% of intussusceptions in adults are secondary to an anatomical or pathological condition, of which more than half are malignant. Idiopathic cases are the exception in adults.

**Case Presentation:** 45 years old man was admitted through emergency with complaint of sever pain abdomen. Before, he had history of such attacks over a period of few weeks. A mass was palpable on left side of abdomen. Rest of signs and symptoms were in favor of acute abdomen. His radiological investigations revealed a mass in the large gut protruding into the lumen. This was further confirmed by the colonoscopy. Surgical exploration revealed large gut obstruction due to intussusceptions. Intralumen benign mass was the main reason of this obstruction. Resection and end to end anastomosis was done.

**Results:** Patient was discharge without any complication on 7th post operative day and biopsy shows some benign growth of colonic wall.

**Conclusion:** Intussusception is uncommon in adults and few general surgeons see even one case in their surgical career. Despite the rarity of adult Intussusception, surgeons need to be familiar with the possible surgical options.

**Keywords:** Intussusception.

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**PP2-042**

**Chronic Granulomatous Disease: Surgical Management of Lower Gastrointestinal Manifestations of the Disease**

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**Aim:** Chronic Granulomatous Disease (CGD) is a rare primary immunodeficiency disorder caused by mutations in the NADPH oxidase system causing defective phagocytosis. Its lower gastrointestinal manifestations can present to the colorectal surgeon in both the elective and acute setting. We present a case series highlighting how these CGD patients can present, and the perioperative challenges this particular cohort of patients can pose.

**Method:** A retrospective review of patients from the United Kingdom’s largest centre for CGD, and discussion of current literature (MedLine and PubMed Search). Main outcome measures used were patient characteristics; type of surgery performed and clinical outcomes.

**Results:** CGD colitis is the commonest presentation to our colorectal department. Colitic patients not amenable to steroid therapy or biological agents have required colonic resection with a defunctioning ileostomy. Liaison with immunologists is crucial prior to consideration of reversal, because stem cell transplantation can offer the patient better outcomes. Perianal sepsis is another reason patients have required intervention. Recurrent perianal disease has warranted an AP resection in some patients. One case from this centre highlights the risk of carcinoma in CDG patients. They required a panproctocolectomy for rectal adenocarcinoma. Post operatively many of these patients developed wound infections or dehiscence.

**Conclusion:** With the knowledge that CGD patients are immunocompromised, often exacerbated by immunomodulatory drugs, the colorectal surgeon must optimize these patients peripheratively to reduce the risk of infections. Bone marrow or stem cell transplant may benefit patients prior to reversal of their stoma. Morbidity and mortality of these patients can be reduced with a multidisciplinary approach. This review postulates the potential role of endoscopic surveillance in CGD patients as they have a risk of colorectal malignancy, as there are no current guidelines for this.

**Keywords:** Chronic granulomatous disease, Surgical management.
Background: Desmoid tumors (DT) are rare and histologically fibroblastic benign tumor. They are unable to metastasize but frequently locally invasive and may lead to severe morbidity and mortality. One of the risk factor is mutation of the Adenomatous polyposis coli (APC) in patients with familial adenomatous polyposis (FAP). This study aimed to evaluate the clinical characteristics and surgical outcomes of FAP with and without DT in our institution.

Methods: Between January 2000 and December 2015, 51 patients diagnosed FAP at Seoul National University Hospital. We have maintained prospectively collected database and reviewed clinical characteristics and pathologic reports of these patients retrospectively. The study included 13 patients with DT [FAP-DT(+)] and 38 patients without DT [FAP-DT(−)] according to the presence of DT.

Results: Of 51 patients, median age at diagnosis was 35.0 years (range, 17–70). The proportion of male patients was higher than female patients (33:18). Ten of FAP-DT(+) group had intra-abdominal DTs, 2 of these had abdominal wall DTs and 1 had both DT. Four (30.8%) of these underwent R0 resection, 2 patients R1 resection, 6 patients R2 resection, 1 patient could not be confirmed resection status. There was no the 30-day operative mortality. Postoperative complications developed 4 patients, which were wound infection (n = 2), UTI (n = 1), and ileus (n = 1). The median follow up was 89.6 months. The mean 16.1 months after operation, in the FAP-DT(+) group, there was no difference in survival rates between the complete resection and incomplete resection (R0 = 50%, R1 = 100%, R2 = 100%, p = 0.154).

Conclusion: Our data showed that the appropriate treatment, including surgical resection was performed to FAP with desmoid tumor will have no impact on survival rate. Even if complete resection is not performed, recurrence rate or survival rate have confirmed that there is no difference.

Keywords: Familial adenomatous polyposis, Desmoid tumor, Colorectal cancer.

Table 1. (for Abstract PP2-044)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age/sex</th>
<th>Size (mm)</th>
<th>Growth type</th>
<th>Complication</th>
<th>Margin</th>
<th>Time (min)</th>
<th>Histology</th>
<th>F/U colonoscopy</th>
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</thead>
<tbody>
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<td>1</td>
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<td>2525</td>
<td>Protruding</td>
<td>Post coagulation SD</td>
<td>Clear</td>
<td>61</td>
<td>Low grade adenoma</td>
<td>Negative</td>
</tr>
<tr>
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<td>3050</td>
<td>LST</td>
<td>Post coagulation SD</td>
<td>Clear</td>
<td>120</td>
<td>Adenocarcinoma</td>
<td>Negative</td>
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<td>58</td>
<td>Low grade adenoma</td>
<td>Negative</td>
</tr>
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<td>45</td>
<td>Adenocarcinoma</td>
<td>Negative</td>
</tr>
<tr>
<td>5</td>
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<td>3025</td>
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<td>Involve</td>
<td>121</td>
<td>Low grade adenoma</td>
<td>Negative</td>
</tr>
<tr>
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<td>5030</td>
<td>LST</td>
<td>Delay bleeding, post coagulation SD</td>
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<td>121</td>
<td>Low grade adenoma</td>
<td>Negative</td>
</tr>
</tbody>
</table>
**PP2-045**

**Parthenolide Enhances Anti-Tumor Efficacy of Balsalazide in Human Colon Cancer Cells and Colitis-Associated Colorectal Cancer by Blockade of NF-kB Activation**

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**Background/Aims:** Balsalazine is a colon-specific prodrug of 5-aminosalicylate (5-ASA) that was recently shown to be associated with a reduced risk of colon cancer in patients with ulcerative colitis. Parthenolide (PT), a strong NF-kB inhibitor, has recently been demonstrated to be a promising anticancer agent that promotes apoptosis of cancer cells.

**Method:** In the present study, we investigated the antitumor effect of balsalazine combined with PT through inhibition of nuclear factor-kB (NF-kB) activation in human CRCs.

**Result:** Our results demonstrated that the combination of balsalazine and PT markedly suppressed proliferation, nuclear translocation of NF-kB, IκB-a phosphorylation, NF-kB DNA binding and expression of NF-kB target proteins. Apoptosis under NF-kB signaling was confirmed by detecting expression of caspases, p53 and PARP. Moreover, treatment of a colitis-associated colon cancer (CAC) murine model with PT and balsalazine resulted in significant recovery of body weight and improvement in histological severity. Administration of PT and balsalazine to CAC models also suppressed carcinogenesis as demonstrated by uptake of 18F-fluoro-2-deoxy-D-glucose (FDG) using micro PET/CT scans.

**Conclusion:** These results demonstrate that PT potentiates the efficacy of balsalazine through synergistic inhibition of NF-kB and the combination of dual agents prevents colon carcinogenesis from chronic inflammation. This is the first evidence that a combination of balsalazine and PT could be a new regimen for colorectal cancer treatment.

**Keywords:** 5-ASA, Balsalazine, Parthenolide, NF-kB, Apoptosis, Colitis-associated colorectal cancer.

**PP2-046**

**MicroRNA-30a Promotes Cell Migration and Invasion in Colorectal Cancer by Targeting the TM4SF1**

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**Background/Aim:** Given the emerging role of microRNA in tumor disease progression, we investigated the association with microRNA expression and metastasis in the cancer.

**Method:** To identify differentially expressed microRNA, we were gained colorectal cancer tissues from the Biobank of Chonbuk University Hospital. For the miR-30a and TM4SF1 pathway, analyzed wound healing, transwell migration, invasion assay, luciferase assay, qRT-PCR, Western blot, and IHC analysis from CRC tissues and CRC cell lines.

**Results:** miR-30a was revealed being the most elevated in normal tissues compared with CRC tissues, and correlated with advanced stage, lymph node metastasis. Over expression of miR-30a was suppressed cell migration and invasion in vitro. Furthermore, TM4SF1 was a directly functional target of miR-30a. Overexpression of miR-30a also inhibited NF-kb, VEGF, while enhanced E-cadherin. TM4SF1 expression level was most significantly up regulated in CRC tissues compared with adjacent normal tissues, and inversely correlated with miR-30a expression.

**Conclusion:** Our result suggested that the tumor suppressor miR-30a promoted CRC cell migration and invasion by regulating E-cadherin/NF-kb/VEGF through direct targeting TM4SF1, it may serve as a novel therapeutic target in CRC.

**Keywords:** Colorectal cancer, TM4SF1, MiR-30a, Invasion, Migration.

**PP2-047**

**Diagnostics and Treatment of the Synchronous Colo-Rectal Tumors (Benign and Malignant) in Surgical Department**

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**Aims:** We discuss the diagnostics of the found synchronous colo-rectal tumors (SCRT) regarding histopathology (benign and malignant); treatment tactics – performed procedures; follow-up.

**Patients:** We retrospectively analyze 45 patients with SCRT treated in the Surgical Departments of our hospital for 2010–2014. Colonoscopies are performed in First Surgical Department by surgeon. Assessed are: number of synchronous tumors per patient; localization; histopathology; TNM stage of malignant; performed procedures – endoscopic and/or surgery.

**Results:** Histopathology of synchronous tumors:

- Benign – 26
- Benign and malignant – 13
- Malignant – 6 cases.

Number of SCRT per patient: 2 tumors – 27; 3 tumors-15; 4 tumors – 2; 10 and more tumors – 1 patient.

Localization: rectum – 21; sigma – 14; descendens – 3; transversum – 3; ascendens – 2; cecum – 2.

Performed procedures:

- Biopsy – 5;
- Biopsy and endoscopic polypectomy – 12;
- Surgery and endoscopic polypectomy – 10;
- Surgery – 18 cases.

The tactics for diagnostics and treatment of the synchronous colo-rectal tumors comprises:

- Total colonoscopy is performed in all cases.
• If synchronous polyps are found small and not proper to be removed, biopsy of every tumor is performed; and patient is included in follow-up.
• Pediculated polyps are removed during colonoscopy. If not possible – subjected to open surgery – laparotomy, colotomy, polypectomy and suture.
• When synchronous benign and malignant tumors are found is possible to:
  • Remove the benign during colonoscopy and surgery for the malignant to follow.
  • Remove one of benign during colonoscopy and surgery for the malignant and the remaining benign (if close) to follow.

Conclusions: The advance in endoscopic technique results in the increase of endoscopic procedures for diagnostics and treatment of colo-rectal tumors. We aim to remove the benign colorectal tumors endoscopically. Colo-rectal cancers are submitted to surgery after endoscopic diagnosis.

PP2-048
Non Stapler Sphincter Saving Surgery in Lower Rectal Cancers in Developing Country
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Background: Lower rectal cancers are very common in developed and developing countries both. Low anterior resection has been life saving with help of circular staplers. In several poor countries many people cannot afford these single use staplers. These patients with much lower rectal cancers are undergoing Abdominopereineal resection hence sacrificing anal sphincter. Incidence of pelvic recurrence is 5 to 20 percent in 5 years, worldwide depending on histological grade, nodal status, surgical technique and local spread.

Methods: Study consist of fifty patients of lower rectal cancers in 2 years age ranging from 19 years to 67 years and only one patient was 19 yrs age. Follow up period was one year. Complete tumor free resection was aimed. Series of operation was performed by same team of surgeons. CT scan and transrectal ultrasound was done for preoperative staging. We did not used preoperative neoadjuvant therapy. We used postoperative RT for pT3 lesions and chemotherapy for node positive patients. The distance of anal verge to lowest edge of tumor ranged from 4 cm to 9 cm with median distance 5.5 cm. Mean anastomotic height was 2.7 cm after sphincter saving resection. All resected specimen were duly examined as per protocol except in two cases where distal rectal stump was reexcised while surgery. Abdominal resection was done laparoscopically following oncological principles. Rectum was transected transanally after gradual dilatation. Anorectal anastomosis was done handsewn above dentate line.

Results: Postoperatively patients were discharged 8th POD. Three patients had minor leak and managed conservatively. One patient developed low anal fistula after 2 month and treated surgically. One patient had anastomotic stricture managed conservatively.

Conclusion: Handsewn coloanal anastomosis through transanal route is costeffective and easy procedure, good for developing countries nonaffording patients. It avoids significantly permanent colostomy in developing countries. It has comparable intraop time, hospital stay and complications. This work needs multicentre study with bigger group and longer followup.

PP2-049
Surgical Management of Perianal Extramammary Paget’s Disease
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Aim: We highlight how symptoms of perianal pruritus and bleeding should be fully investigated in Colorectal Clinic. A 64-year-old lady with circumferential perianal skin changes and these symptoms was diagnosed with extramammary Paget’s disease (EMPD) and managed surgically.

Method: A perianal skin punch biopsy of her skin changes showed an intraepidermal adenocarcinoma. Immunohistochemistry showed CK7 and CK20 staining in these cells, highlighting the importance of investigating an underlying adenocarcinoma. A CT pneumocolon and perineal MRI did not reveal disease elsewhere, therefore her diagnosis was EMPD.

Results: She was managed with a defunctioning laparoscopic sigmoid loop colostomy, enabling wound healing following wide local excision of the perianal EMPD. A split-thickness skin graft allowed wound reconstruction.

Conclusion: This case emphasizes how EMPD can present in the colorectal clinic. If so, diagnostic investigations to rule out an underlying primary malignancy are prudent, as perianal extramammary Paget’s is associated with a 25–35% chance of colorectal adenocarcinoma. Wide local excision is the main treatment modality, and this case highlights other techniques to improve a patient’s post-operative recovery.

Keywords: Extramammary pagets.
Long-Term Oncologic and Surgical Outcomes of Primary Small and Large Intestine Lymphoma for Patients with or without Perforation

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Background/Aims: Lymphomas of small intestine, colon, and rectum represent about 15 to 20% of gastrointestinal (GI) lymphoma. However, the clinical features and outcomes remain unclear. This study aimed to analyze the characteristics and prognostic factors in the patients who had surgical treatment for small and large intestinal lymphoma, and the impact of intestinal perforation at operation on the overall survival.

Methods: This retrospective study included 90 prospectively enrolled patients who underwent surgeries for small intestinal and colorectal lymphoma between 1998 and 2013. Patients were categorized into two groups: those with (perforation group, n = 29) and without (non-perforation group, n = 61) perforation.

Results: There were 60 males and 30 females with median age of 58.5 years (range, 20–81 years). There was a significantly higher proportion of initial treatment with chemotherapy (41.4% vs. 21.3%, P = 0.047) in perforation group. The perforation group had a poor Eastern Cooperative Oncology Group (ECOG) performance status (ECOG 2-4) (p = 0.040), elevated lactate dehydrogenase (LDH) (p = 0.008), advanced disease stage (III or IV) (p = 0.004), and high international prognostic index than non-perforation group (p = 0.001). Postoperative complication rate was significantly higher in perforation group (41.4% (12/29) vs. 13.6% (8/61), P = 0.004). Five-year overall survival (OS) of perforation group was significantly worse (44.8% vs. 64.7%, P < 0.001). On multivariable analysis, the following were found to be prognostic factors for OS: age over 70 years [hazard ratio (HR) = 3.39, P = 0.004], elevated LDH level (HR = 2.99, P = 0.016) and T-cell lymphoma (HR = 3.69, P = 0.007).

Conclusion: Patients presented with intestinal perforation in lymphoma of small and large intestine have a poor OS after surgical treatment compared to without perforation. Thus, intestinal perforation should be minded cautiously.

Keywords: Gastrointestinal lymphoma, Colon and rectum, Small bowel, Overall survival, Prognostic factor.

Gender-Dependent Difference in the Effect of Metformin on Colorectal Cancer-Specific Mortality of Diabetic Colorectal Cancer Patients

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Background: Previous studies have shown that metformin use is associated with decreased colorectal cancer (CRC) mortality. However, the particular factor related to effectiveness of metformin has not been identified. This study aimed to assess factors which may affect the effect of metformin on CRC-specific mortality in diabetic CRC patients using metformin.

Methods: 794 patients were identified diagnosed with both CRC and diabetes mellitus (DM) between January 2000 and December 2010. Considering the results of our previous study, stage 3 and 4 patients were sorted and total 413 were finally analyzed; 185 patients taking metformin and 228 patients not taking metformin. Adjusting clinical factors and demographics, the effect of metformin on CRC-specific mortality and the interactions between metformin and each adjusting factors were evaluated.

Results: In univariate analysis, metformin duration was associated with lower CRC-specific mortality (HR = 0.724, 95% CI 0.537–0.976, p = 0.032) and lower overall mortality (HR 0.706, 95% CI 0.537–0.929, p = 0.013) in CRC patients with DM. Interaction test between metformin and sex was performed after adjustment for relevant factors, and it revealed that female CRC patients taking metformin exhibited a significantly lower CRC-specific mortality rate compared to male CRC patients taking metformin (HR = 0.376, 95% CI 0.137–0.998, p = 0.05). In each univariate analysis, female patients had significant difference of CRC-specific mortality between metformin and non-metformin group (HR = 0.013, 95% CI 0.286–0.879, p = 0.013), while male patients showed no significant difference between two groups (HR = 0.365, 95% CI 0.537–0.929, p = 0.376). Interaction tests between metformin and other adjusting factor did not show any significant difference in CRC-specific mortality. In metformin group only, improved CRC-specific (HR 0.979, 95% CI 0.961–0.998, p = 0.03) and overall survival rate (HR 0.983, 95% CI 0.968–0.998, p = 0.031) associated with metformin duration was seen.

Conclusion: This study shows strong gender-dependent difference in the effect of metformin on CRC-specific mortality of advanced stage CRC patients with diabetes. Further large-scale studies are needed to conjecture this relationship.

Keywords: Colorectal cancer, Metformin, Survival, Gender.
PP2-052

Establishment of Patient-Derived Tumor Xenograft Models for Tailored Therapy in Colorectal Cancer

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Background/Aim: Colorectal cancer (CRC) is the third most commonly diagnosed cancer in males and the second in females worldwide. To improve prognosis for CRC patient, the concern for the tailored cancer therapies are growing. Recently, patient-derived xenograft (PDX) mouse models have emerged as important tools for cancer genetic research, with the promise of enabling a more personalized approach to patient care. We here conduct to develop and establish an efficient system for colorectal cancer.

Method/Result: Human fresh tumor tissues obtained from colorectal cancer patients were implanted into the subcutaneous flank of NSG mice (establish rat = 57%) and serially passaged in vivo. The generated tumors in PDX models were performed by histopathological and genomic evaluation using original tumors. Histopathological analysis shown that high degree of morphological similarities and expression of CK7, CK20, CEA, and EGFR were well conserved between the original and PDX tumors. Genomic analysis of original and PDX tumors using STR (short tandem repeat) profiles also revealed the same patterns.

Conclusion: Taken together, these results indicate that our colorectal PDX models maintain the key features of original tumors and may be provided a valuable tool of novel therapeutic strategies for the treatment of colorectal cancer.

Keywords: PDX, Colorectal cancer.

PP2-053

Evaluation of Treatment Response as Prognostic Indicators Following Neoadjuvant Chemoradiotherapy in Stage II/III Rectal Cancer Patients

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Background/Aims: The objective of this study was to search the prognostic factors and compare overall survival and disease free survival between Good Response Group (GRG) and Poor Response Group (PRG) after neoadjuvant chemoradiotherapy (Neoadjuvant CCRT) in clinical stage II/III rectal cancer.

Methods: A total of 71 patients treated with neoadjuvant CCRT for T3-T4 and/or node-positive rectal cancer from July 2004 to August 2010. Most patients were treated with 50.4 Gy radiation and concurrent 5-FU or capcitabine base chemotherapy. The patients were categorized by response: Good Response Group (GRG, above 2 reduction of T stage, down-staging, or complete regression) or Poor Response Group (PRG).

Results: The 5-year overall survival (OS) of the GRG and PRG were 76.5% and 76.6% (p = 0.969) The 5-year disease free survival (DFS) of the GRG and PRG were 81.3% and 72.9% (p = 0.497) Preoperative clinical stage III is more sensitive (OR 0.225, 95% CI 0.082–0.621, p = 0.0044) And tumor location (<8 cm from anal verge) (OR 3.895, 95% CI 1.164–13.030, p = 0.027) was independent predictors of good response.

Conclusion: Preoperative clinical stage and tumor location were independent predictors of response of neoadjuvant CCRT, but neoadjuvant CCRT response is not significant prognostic indicators in neoadjuvant CCRT group in rectal cancer patients.

Keywords: Rectal cancer, Neoadjuvant CCRT, Clinical predictors.
**Conclusion:** The rate of complete response in our study is less than the figures reported in the literature. This may be due to the aggressiveness of the disease and delayed presentation.

**Keywords:** Complete clinical pathological response neoadjuvant rectal cancer africa sudan.

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**PP2-055**

**The Efficacy of Measurement of a Serum Anti-p53 Antibody Level Compared with Serum CEA and CA19-9 Levels as a Preoperative Screening Test**

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**Introduction:** A p53 gene mutation occurs very frequently in patients with various malignant tumors including colorectal cancer. Furthermore an anti-p53 antibody appears frequently in serum of patients with colorectal cancer. In this study, we try to clarify the efficacy of the measurement of a serum anti-p53 antibody level compared with serum CEA and CA19-9 levels as a preoperative test.

**Patients and Methods:** We measured serum anti-p53 antibody, CEA, and CA19-9 levels in 185 patients with colorectal cancer, underwent surgical treatment in Wakayama Medical University Hospital between June, 2008 and December, 2009. We evaluated the efficacy as a preoperative test in terms of the detection of the cancer patient and the prediction of a risk of a recurrence and a prognosis.

**Results:**
- A Positive rate (PR) of p53 was significantly higher than those of CEA and CA19-9. A PR in combination measurement of p53+CEA was significantly higher than any other combination.
- On the other hand, by an univariate analysis, in terms of 5 y-disease free survival (DFS) of 148 patients with stage 1–3, positive rates of lymph node metastasis, CEA, CA19-9, CEA+CA19-9 and CEA+CA19-9+p53 were significant prognostic factors, whereas by a multivariate analysis, a positive rate of lymph node metastasis was a significant prognostic factor. Moreover, by an univariate analysis, in terms of 5 y-over all survival (OS) of all patients, positive rates of lymph node metastasis, liver metastasis, peritoneum metastasis, the other metastasis, CEA, CA19-9, CEA+CA19-9 and CEA+CA19-9+p53 were significant prognostic factors, whereas by a multivariate analysis, positive rates of lymph node metastasis and the other metastasis were significant prognostic factors.

**Conclusion:** We demonstrated that a measurement of serum p53 was as efficient as that of serum CEA and CA19-9 in patients with colorectal cancer. Whereas it may be less efficient as preoperative predictive test in terms of 5 y-DFS and 5 y-OS.

**Keywords:** Serum anti-P53 antibody level, Colorectal cancer, Preoperative screening test.

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**PP2-056**

**Two-Assistant Port, Four-Arm, Single Docking Full Robotic Surgery for Middle and Low Rectal Cancer: A Worthwhile Way to Shorten the Learning Curve for the Beginner**

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**Background:** Robotic middle and low rectal surgery has not yet achieved a high penetration rate because of its steep learning curve and its status of single operator. The article was to present an early experience with robotic surgery to treat middle and low rectal cancer focusing on the technique and early postoperative outcomes.

**Methods:** From March 2016 to May 2016, a total of 20 initial patients with middle and low rectal cancer were operated on using a two-assistant port four-arm single docking full robotic procedure (daVinci Si Surgical System). The additional assistant port is above the pubic symphysis. We analyzed our special technique standardization, pathological findings and postoperative outcomes.

**Results:** There were one conversions and no intraoperative complication. The mean operative time was 215 min (150–300 min). The mean console time was 150 min (100–210 min). All patients underwent a standardized totally robotic rectal dissection. There were no mortality or urinary dysfunction and one complication (late anastomotic leak). The median length of hospital stay was 6 (4–10 days). The median number of lymph nodes harvested was 28 (13–40), and distal and circumferential resection margins were negative in all specimen. R0 resection and complete total mesorectal excision were achieved in all cases.

**Conclusion:** Our special way for robotic rectal surgery is a promising alternative to treat patients with mid or low rectal cancer and is expected to shorten the learning curve for the beginner in this field. This technique was successfully performed in initial 20 patients with excellent immediate postoperative and pathological results.

**Keywords:** Robotic rectal surgery, Full robotic low anterior resection.
**PP2-057**  
**Surgical and Oncological Outcomes of Surgical Treatment for Colorectal Cancer with End-Stage Renal Disease: A Propensity-Score Matching Analysis**  
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**Background:** End-stage renal disease (ESRD) patients are thought to be associated with an increased postoperative complication of colorectal cancer (CRC). Only a few case reports had addressed the use of chemotherapy in patients with both ESRD and CRC. This study aimed to evaluate the surgical and oncologic outcomes of ESRD patients with CRC.

**Methods:** Between 2002 and 2014, Thirty-two consecutive patients with ESRD underwent colorectal resection for CRC (ESRD group). To minimize the effect of potential confounders on selection bias, a propensity-score matching analysis was performed to compensate for the differences in baseline patient characteristics (age, gender, location of tumor and stage). Totally, 96 patients were enrolled with 64 patients without ESRD. Perioperative outcomes, overall survival (OS) and time to recurrence (TTR) were compared between two groups.

**Results:** The most common cause of ESRD was diabetic nephropathy (n = 20). Thirty patients were treated with hemodialysis. There was no difference in ALI, VI, PI, and retrieved lymph nodes. The postoperative complication rate was significantly higher in ESRD group (28.1% vs. 9.4%; p = 0.017). The ESRD group had a lower adjuvant chemotherapy treatment. Median follow up period was 43.9 months (range: 1.3–161.9 months). TTR did not differ between ESRD and Non-ESRD group (5-year recurrence rate: 20.1% vs. 16.7%; p = 0.587). 5-year OS did not differ between ESRD and Non-ESRD group (5-year recurrence rate: 20.1% vs. 16.7%; p = 0.587). 5-year OS did not differ between ESRD and Non-ESRD group (5-year recurrence rate: 20.1% vs. 16.7%; p = 0.587).

**Conclusion:** ESRD patients with CRC had more postoperative complications and worse in OS compared to Non-ESRD patients, but TTR were not different, indicating that surgical treatment for CRC in ESRD is warranted. OS of ESRD patients were worse than Non-ESRD patients in stage IV, and it might be due to lower rate of chemotherapy.

**Keywords:** Colorectal cancer, End-stage renal disease, Propensity-score matching.

**PP2-058**  
**Short-Term Surgical Outcome of TAMIS-TME for the Distal Rectal Cancer**  
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**Introduction:** TransAnal Minimally Invasive Surgery of TME for distal rectal cancer facilitates dissection of tumors in patients with a narrow pelvis, bulky tumor, and obesity. TAMIS provides good visibility and safer transanal TME, while extensive rectal mobilization reduces abdominal procedures.

**Subjects:** Surgery was performed in 19 patients (15 men and 4 women, mean age: 66.7 years, mean BMI: 20.8) from October 2013. Those operative procedures were ISR for 10 patients, LAR/CAA for 5, APR for 4.

**Transanal Procedures:** Initially we start from the anal side for intersphincteric dissection under direct vision, and mount the EZ to provide access to the transanal TME. Posterior dissection follows a connective tissue outside the pre-hypogastric nerve fascia as a landmark. Laterally, dissection proceeds inside the pelvic splanchnic nerves as a landmark. In males, dissection between the prostate/seminal vesicles and rectal wall is considered difficult, but magnification facilitates it. Dissection proceeds cephalad from the rectum along the prostate midline to the pouch of Douglas, followed by right and left dissection with awareness of the anterior rectal wall. Using the lateral pelvic fascia enclosing the prostate and rectum as a landmark, transection is done as far as possible to prevent neurovascular bundle injury. Dissection near the prostate reaches Denonvillier’s fascia attached to the rectum.

**Results:** Pathological Stage was 0/I/II/III/IV: 1/5/4/5/3, R0 resection rate of primary tumor was 100%. Average operation time was 445.7, median blood loss was 96 (10–765 cc). Postoperative complications include a urinary retention in 3 patients, stoma trouble in 2, intestinal obstruction in 2, and compartment syndrome of lower extremity in 1. All of those complications were grade2 of CD classification.

**Summary:** TAMIS-TME for lower rectal cancer allow safer TME and decreases abdominal procedures. However, proficiency in recognizing anatomical knowledge from the anal side is essential to avoid nerve injury and bleeding.

**Keywords:** Rectal cancer, TAMIS, TME.
PP2-059
Visceral Obesity and Umbilical Hernia are Risk Factors for Incisional Hernia after Laparoscopic Colorectal Surgery
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Background: Incisional hernia (IH) is frequent complication after colorectal surgery. However, risk factors for incisional hernia formation are not fully elucidated. The aim of this study was to evaluate the risk factors for IH after laparoscopic colorectal surgery (LCRS).

Method: Four hundred eighty consecutive patients who underwent laparoscopic surgery for colorectal cancer between September 2012 and December 2014 were examined, retrospectively. The patients with laparoscopic abdominoperineal resection were excluded. All laparoscopic wounds were closed incorporating identical closure technique. The diagnosis of IH was performed by CT scan. Additional independent reviewing of all CTs by three surgeons was performed. Preoperative CT scans were used to measure visceral fat area (VFA), subcutaneous fat area (SFA).

Results: 1-year incidence of IH was 14.1% and 2-year incidence was 18.1%. Mean follow up was 21.2 months. Univariate analysis revealed that Umbilical hernia, body mass index (BMI)>25 kg/m2, VFA >100 cm2, SFA >110 cm 2, blood loss >100 ml and length of wound >50 mm were significantly associated with incidence of IH after LCRS. Multivariate analysis identified umbilical hernia (hazard ratio (HR) 3.231; 95% confidence interval (CI) 1.372–7.613; P = 0.007), VFA >100 cm2 (HR 2.45; CI 1.351–4.440; P = 0.003) and blood loss (HR 1.879; CI 1.102–3.203; P = 0.021) as independent risk factors for IH after LCRS.

Conclusions: The risk factors of IH after laparoscopic surgery for colorectal cancer were umbilical hernia, VFA >100 cm 2 and blood loss >100 ml.

Keywords: Incisional hernia, Laparoscopic colorectal surgery, Risk factor.

PP2-060
The Association between Preoperative Anemia and Prognosis in Resected Colorectal Cancer
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Introduction: Anemia is one of the symptoms of colorectal cancer and 25% of colorectal cancer patients have anemia less than 10 g/dl. Because preoperative anemia and perioperative blood transfusion have been reported to worsen the prognosis, iron is administrated to improve anemia and to avoid perioperative blood transfusion. The aim of this study was to evaluate prognostic factor including preoperative anemia and perioperative blood transfusion in patients underwent the curative resection of colorectal cancer.

Materials and Methods: From April 2005 to March 2013, 369 patients with Stage 0~III were undergone colectomy and enrolled in this study. Preoperative anemia was defined as Hb <10 g/dl and perioperative blood transfusion was defined as blood transfusion until POD7 from operation. Overall survival (OS) and disease free survival (DFS) were evaluated.

Results: Patients’ mean age was 70 years old (range: 27–90 years); 218 patients were male and 151 were female. Ninety-two patients had right colon cancer and 277 had left colon cancer. Preoperative chemotherapy was done in 13 cases and adjuvant chemotherapy in 108 cases. Stage 0:I:II:III = 21:132:119:97. The mean operation time was 276 minutes (range: 112–1056 minutes), the mean blood loss was 84 g (range: 0–9131 g), 64 patients (17.3%) had preoperative anemia, 64 patients (17.3%) had perioperative blood transfusion. Multivarate analysis for DFS revealed that tumor depth (p = 0.003, HR:2.48), lymph node metastases (p = 0.0001, HR:2.69), preoperative chemotherapy (p = 0.0006, HR:2.40) and preoperative anemia (p = 0.01, HR:2.13) were independent predictive factors. Lymph node metastases (p = 0.01, HR:2.28) and preoperative anemia (p = 0.07, HR:2.70) were independent predictive factor for OS.

Conclusion: Preoperative anemia worsen prognosis in patients underwent the curative resection of colorectal cancer, and the improvement of preoperative anemia may improve the prognosis of colorectal cancer.

Keywords: Colorectal cancer, Surgery, Preoperative anemia.
**PP2-061**

**Is There the Worst Indication of Laparoscopic Surgery for Rectal Cancer: A Cross Sectional Study for Long-Term Oncologic Outcomes in a Tertiary Referral Hospital with Experienced Surgeons**

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**Background:** Laparoscopic surgery for rectal cancer should be performed selectively because several randomized controlled trials failed to show that laparoscopic surgery is non-inferior to open surgery. This study aimed to investigate the risk factors for poor oncologic outcomes after laparoscopic rectal cancer surgery.

**Methods:** We performed a retrospective review of patients who underwent laparoscopic surgery for extraperitoneal rectal adenocarcinoma in a tertiary-referral hospital with experienced surgeons between March 2006 and December 2013. Patients who had stage IV or underwent transanal excision were excluded.

**Results:** Of the 439 patients with a median follow-up period of 40 months (range 0–145 months), 62 patients (14.1%) had recurrence. Nodal metastasis (hazard ratio [HR] 3.098, 95% confidence interval [CI] 1.763–5.963, \( p < 0.001 \)) and positive circumferential resection margin (CRM) (≤1 mm, HR 2.833, 95% CI 1.346–5.963, \( p < 0.001 \)) were independent risk factors. However, following factors were not related to recurrence: large tumor size (≥5 cm, HR 1.768, 95% CI 0.994–3.142, \( p = 0.052 \)), elevated preoperative carcinoembryonic antigen (>5 ng/ml, HR 1.680, 95% CI 0.953–2.961, \( p = 0.073 \)), tumor located in the low-rectum (<5 cm from anal verge, HR 1.672, 95% CI 0.952–2.936, \( p = 0.074 \)), male (HR 1.138, 95% CI 0.672–1.930, \( p = 0.630 \)), high body mass index (≥25 kg/m², HR 0.925, 95% CI 0.517–1.655, \( p = 0.792 \)), and T4 lesion (HR 0.949, 95% CI 0.273–3.295, \( p = 0.934 \)).

**Conclusion:** This study reveals that laparoscopic surgery under experienced surgeon does not increase oncologic risk for rectal cancer with well-known risk factors, such as large tumor size, low rectal tumor, male, obesity, or T4 lesion. In addition, we confirm that node metastasis and positive CRM are oncologic risk factors for laparoscopic rectal cancer surgery.

**Keywords:** Oncologic risk factor, Laparoscopic surgery, Rectal cancer.

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**PP2-062**

**Comparison Study of the Long-Term Outcomes between Open Surgery and Laparoscopic Surgery for Stage II and III Colorectal Cancer (CRC)**

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**Purpose:** A cohort study of long-term outcomes for advanced colorectal cancer (Stage II and III) was analyzed.

**Subject:** Consecutive 299 patients of stage II/III of CRC were received radical operation from 2010 to 2014, 116 patients of open surgery <O group> and 183 of laparoscopic surgery <Lap group> were compared for the recurrence rate and the RFS. Statistical analysis was performed. \( p \) values were considered significant \(<0.05\).

**Patients Characteristic:** <O group>: Stage (ll/lll: 61/55), gender (F/M: 47/69), age 35–92 (median: 69), site of the lesion (Colon 84/Rs 13/R + b 19), adjuvant chemotherapy (±: 52/64). <Lap group>: Stage (ll/lll: 112/71), gender (F/M: 78/105), age 38–91 (median 70), site of the lesion (Colon 120/Rs 27/R + b 36), adjuvant chemotherapy (±: 95/88).

**Result:** The recurrence rates was significantly lower in Lap group than O group, 10% and 21% (\( p = 0.010 \), Odds ratio = 2.38). PFS was also better in Lap group, but there was no significant difference.

Sub group analysis were performed between T4 and T3/less, the recurrence rate of T3/less showed a significantly lower value in Lap group (O group: 22.1%, 19/86 cases vs. Lap group: 6.5%, 10/153 cases, \( p = 0.001 \), OR = 4.03), but in T4 the recurrence rate in Lap group showed higher, but not significantly (O group: 16.7%, 5/30 cases vs. Lap group: 26.7%, 8/30 cases).

RFS showed no difference between T4 and T3/less in O group, on the other hand, in Lap group the RFS of T4 showed worse than T3/less significantly (\( p < 0.001 \)).

**Consideration:** It was suggested that the recurrence rate and RFS might be worse in T4 laparoscopic group.

**Keywords:** Colorectal cancer, Laparoscopic surgery, Recurrence.
PP2-063
The Comparison of Results between Endoscopic Submucosal Dissection or Transanal Endoscopic Microsurgery for Early Rectal Cancer and Rectal Subepithelial Tumor

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Background/Aims: The effectiveness of colorectal endoscopic submucosal dissection (ESD) and transanal endoscopic microsurgery (TEM) for early rectal cancer has increased. These two procedures are effective for diagnosis and definitive treatment for rectal subepithelial tumor (SET). The aim of this study was to compare the treatment efficacy of ESD and TEM for the treatment of early rectal cancer and rectal SET.

Methods: We retrospectively analyzed 25 patients with early rectal cancer and 15 patients with rectal SET who were treated with ESD (16 patients and 8 patients respectively) or TEM (9 patients and 7 patients respectively) between January 2013 and November 2015. Treatment results were analyzed with respect to en bloc resection rate, procedure time, hospital stay, local recurrence, additional procedure rate, complications.

Results and Discussion: There were no significant differences in tumor size and histological depth and endoscopic appearance between the two groups. For ESD compared with TEM in rectal cancer, En block resection rates were 100% vs. 100% and R0 resection rates were 93.7% vs. 88% (P = 0.66). And in rectal SET, en block resection rates and R0 resection rates were 100% vs. 100% respectively. The net procedure time was 81.9 ± 57.4 min vs. 92.2 ± 27.2 min (P = 0.62) in rectal cancer and 27.1 ± 9.8 min vs. 77.1 ± 27.2 min (P = 0.002) in SET respectively. Hospital stay was 4.1 ± 27.1 min (P = 0.62) in rectal cancer and 27.1 ± 9.8 min vs. 77.1 ± 27.2 min (P = 0.002) in SET respectively. There was no Recurrence except one case in TEM group of rectal cancer.

Conclusion: Both ESD and TEM showed favorable en block (R0) resection rate and recurrence rate. ESD and TEM are effective, efficient and safe for the treatment of early rectal cancer and rectal SET. ESD should be considered as effective treatment option of early rectal cancer and rectal SET.

Keywords: Endoscopic submucosal dissection (ESD), Transanal endoscopic microsurgery (TEM).

PP2-064
The Status of Margins in Liver Resection for Hepatocellular Carcinoma

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Background: The definition of adequate margins in hepatocellular carcinoma remains debatable. Traditionally, it was believed that wider resection margins are associated with lower rates of recurrence. However, many factors such as impaired liver function, inadequate future liver remnant or proximity between tumour and major vasculature may preclude this. We aim to investigate the relationship between resection margins and survival outcomes such as recurrence pattern, rate and overall survival.

Methods: All liver resections performed with a curative intent for HCC was reviewed from a prospectively maintained database. Patients were divided into 4 groups according to their resection margins – Positive (<0.1 mm), Close (0.1–0.9 mm), Narrow (1–9 mm) and Standard (≥10 mm). Patients’ clinicopathologic characteristics, the relationship between the width of the surgical margins and rates of recurrence rate, patterns and overall survival was analysed.

Results: From 1993 to 2012, 737 patients with HCC who underwent liver resections. The clinicopathologic characteristics between the 4 groups were not significantly different. The overall recurrence-free survival and 5-year recurrence-free survival (RFS) for the Positive, Close, Narrow and Standard margins group were 57, 31, 62, 91 months, and 30, 25, 32, 48% respectively. The median overall survival (OS) and 5-year OS for the Positive, Close, Narrow and Standard margins group were 74, 44, 91, 69 months, and 47, 47, 56, 62% respectively. There is significant differences among the margin recurrence curves (p = 0.005). After adjustment for multiple variables, only the Standard margins recurrence curve was significant different from the three other groups (all p < 0.002). There is an improved OS trend towards significance in patients in the Standard margins vs. the other 3 groups (p = 0.06).

Conclusion: Wide margins provide the best OS and RFS and should be attempted wherever possible. However, where close margins are expected, they should not preclude the patient from undergoing the hepatectomy as they do not show significantly worse outcomes as compared to the standard resection margins.
PP2-065
Prediction of Surgical Site Infection after Liver Resection with Various Nutritional Indexes
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Background/Aims: Surgical site infections (SSIs) have decreased by progress of wound management and perioperative care, but we frequently experience SSIs after liver resection relatively. The aim of this study is to examine the relationship between various nutritional indexes and development of SSIs in patients after liver resection.

Methods: We retrospectively evaluated 135 consecutive patients undergoing liver resection without extrahepatic bile duct resection between April 2008 and March 2014. Nutritional indexes were Glasgow prognostic score (GPS, Miki’s criteria), Prognostic Nutritional Index (PNI), and Controlling Nutritional Score (C0-NUT score). Wound closure method was as follows: peritoneum and fascia was sutured by absorbable monofilament and after jetted cleaning the subcutaneous space with saline, placed a closed-suction drain in subcutaneous space. Finally subcuticular suture was performed. Univariate and multivariate analyses were performed to identify clinicopathological variables and nutritional indexes associated closely with SSIs.

Results: SSIs were observed in 19 of 135 patients (14.1%) after liver resection without extrahahepatic bile duct resection. Superficial and organ/space SSIs were observed in 10 patients (7.4%) and 9 patients (6.7%), respectively. On univariate analysis, males (p = 0.002) were significantly associated with increasing risk of superficial SSIs, and the organ/space SSIs were significantly frequent in GPS (CD group of Miki’s criteria, p = 0.030) and long operating time (≧6 hr, p = 0.001). On multivariate analysis, GPS (CD group, p = 0.043) and males (p = 0.002) were associated with superficial SSIs independently and long operating time was associated with organ/space SSIs.

Conclusion: We retrospectively evaluated SSIs after liver resection in terms of clinicopathological variables and nutritional indexes. GPS reflects the inflammation and nutritional status, and it considered to be clinically useful predictor of the superficial SSIs after liver resection.

Keywords: Hepatocellular carcinoma, Surgical site infection, Glasgow prognostic score, Prognostic nutritional index.

PP2-066
Interrelationships between Regional Hemodynamics, Regeneration Rates and 99mTc-Mebrofenin Hepatobiliary Scintigraphy of the Functional Liver Remnant in Alpps Procedures: Preliminary Results of a Pilot Study
Federico Tomassini, Giammauro Berardi, Karen Geboes, Stephanie Laurent, Marc De Man, Bieke Lambert, Clarisse Lecluyse, Jo Van Dorpe, Roberto Troisi
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Background/Aims: Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy (ALPPS) enables faster regeneration of the future liver remnant. Hepatobiliary scintigraphy with 99mTc-Mebrofenin is an accurate method to assess post-hepatectomy risk of liver failure. We assessed the role of the hemodynamic stress and its relationships with regeneration and function of the future liver remnant in a pilot study.

Methods: From June 2013 sixteen patients (61 ± 12.4 years old) were selected for ALPPS. The majority of patients (n = 10; 62.5%) suffered by Colorectal liver metastases. Tri-phasic-CT and Mebrofenin were done before ALPPS1 and 2. Portal vein flow, portal vein pressure and hepatic vein pressure gradients were measured before and after the splitting in ALPPS1 and before and after completion of hepatectomy in ALPPS2.

Results: The waiting time between ALPPS1 and 2 was of 13.4 ± 3.6 days with an overall regeneration-rate before ALPPS2 of 57 ± 26.3%. Analyzing the Mebrofenin % increase was of 11 ± 8.1%. Patients with a higher regeneration rate (>40%, n = 10/16) had a significantly lower hepatic vein pressure gradient after splitting (5 vs. 9.3 mm Hg; p = 0.05). Regarding the post-operative results 10 pts (62.5%) experienced post-operative complications defined in the majority of cases with Clavien-Dindo Grade 2. Persisting ascites on postoperative day 7 (2028.6 ± 1003 ml) was observed in 7/16 pts (62.5%) and resulting in a lower regeneration rate after ALPPS2 (44 ± 13.8% vs. 58 ± 38%).

Conclusions: ALPPS procedure increase future liver remnant volume of at least 50% and the Mebrofenin uptake up to 12% following a mean delay of 13 days. The regeneration rate is higher in patients with a hepatic vein pressure gradient below 5 mm Hg whereas persisting postoperative ascites production is correlated to a higher portal vein pressure and hepatic vein pressure gradient post ALPPS1.

Keywords: Associating liver partition and portal vein ligation, Staged hepatectomy, Hemodynamic stress, Mebrofenin, Scintigraphy.
PP2-067
Hemodynamic Changes in Hepatocellular Carcinoma and Liver Parenchyma Under Balloon Occlusion of the Hepatic Artery
Fumie Sugihara1, Satoru Murata1, Tatsuo Ueda1, Daisuke Yasui1, Hidenori Yamaguchi1, Izumi Miki1, Chiaki Kawamoto2, Shin-ichiro Kumita1
1Radiology, Nippon Medical School, 2Internal Medicine, Nippon Medical School, Japan

Background and Aims: Balloon-occluded transarterial chemoembolization has been used to treat hepatocellular carcinoma (HCC). However, hemodynamics of the liver and tumor under balloon occlusion of the hepatic artery has not been evaluated. Therefore, the aim of this study was to investigate hemodynamic changes in HCC and liver parenchyma under hepatic artery occlusion.

Methods: Thirty-eight HCC nodules in 25 patients were included. Computed tomography (CT) hepatic arteriography (CTHA) with and without balloon occlusion of the hepatic artery was performed. CT attenuation and enhancement volume of HCC and liver parenchyma with and without balloon occlusion were measured on CTHA. Influence of balloon position (segmental or subsegmental branch) was evaluated based on differences in HCC-to-liver parenchyma attenuation ratio (H/L ratio) and enhancement volume of HCC and liver parenchyma.

Results: In the segmental group (n = 20), H/L ratio and enhancement volume of HCC and liver parenchyma were significantly lower with balloon occlusion than without balloon occlusion. However, in the subsegmental group (n = 18), H/L ratio was significantly higher and liver parenchyma enhancement volume was significantly lower with balloon occlusion; HCC enhancement volume was similar with and without balloon occlusion. Rate of change in H/L ratio and enhancement volume of HCC and liver parenchyma were lower in the segmental group than in the subsegmental group. There were significantly more perfusion defects in the segmental group.

Conclusions: Hepatic artery occlusion causes hemodynamic changes in HCC and liver parenchyma, especially with segmental occlusion.

Keywords: Balloon occlusion, Transarterial chemoembolization, Hepatocellular carcinoma, Hemodynamics.

PP2-068
Ipsilateral Liver Lobe Devascularization Treatment for the Large Hepatocellular Carcinoma
Osama Elsanousi1, Ibrahim Abuzeid2, Murtada Mohamed3, Elsadig Adam4
1Surgery, Faculty of Medicine, The National Ribat University, 2Surgery, Omdurman Islamic University, 3Interventional Radiology, Ribat University Hospital, 4Pathology, The National Ribat University, Sudan

Background/Aims: Hepatocellular carcinoma rapid growth and invasiveness largely depend on its vascularity and active angiogenic capacity. The aim of this study is to assess the safety and the short term effects of the surgical isolation of the arterial blood supply of the liver lobe involved with large and unresectable hepatocellular carcinoma.

Method: Thirteen adult patients with large-sized hepatocellular carcinoma (diameter greater than five centimeters) were enrolled in this study. During a laparotomy their ipsilateral hepatic artery(ies) were ligated; ipsilateral ligaments and any other malignant adhesions were also divided. Ultrasonography was used to assess the postoperative changes.

Results: The mean age of the patients was 61.9 ± 9.4, ranging from 40 to 75 years. Eight patients (61.5%) had tumors of diameter > ten centimeters. Seven patients (53.8%) were advanced stage and two patients (30.8%) were terminal stages. One mortality (7.7%) in the fourth postoperative week was encountered. Major postoperative complications were noted in four (38.5%) patients. The highest Clavien-Dindo grade of complications experienced by one patient (7.7%) was grade ‘III-a’ (incisional hernia). One month following the operation the main hepatic artery diameter increased in average by 9.4 ± 6.4%. The contralateral hepatic artery diameter increased in average by 16.2 ± 8.7%. The contralateral liver lobe maximum diameter increased by a mean percentage of 31.4 ± 17.3% (range of 7.1–52.5%) after one month of the operation. The tumor maximum diameter decreased by a mean percentage of 12 ± 7.8% (range of 2.7–28.8%).

Conclusion: The preliminary results of this study show that devascularization of the liver lobe diseased with large hepatocellular carcinoma is safe; produces increased blood supply and hypertrophy of the contralateral liver lobe and make the tumor size smaller.
Surgical Resection of a Solitary Lymphnode Metastasis from Hepatocellular Carcinoma: Resection or Systemic Treatment

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Introduction: Hepatocellular carcinoma (HCC) is the fifth most common solid tumor in the world, but outcomes after hepatic resection remain still unsatisfactory due to recurrence. The most frequent site of extrahepatic metastases is the lung, followed by the adrenal gland and bone. Lymph node (LN) metastases after HCC resection are uncommon and there is currently no standard treatment. We describe the surgical resection of a solitary LN metastasis from HCC.

Presentation of Cases: Jan. 2013, a patient was performed left hepatectomy due to HCC. After 6 months, intrahepatic recurrence was diagnosed, and he received TACE, twice. In 4 months after the last TACE, and 13 months after hepatic resection, a single LN metastasis was found in the PET scan. He was 58-year-old man and chronic hepatitis B patient. He had no jaundice and Child A state. The tumor marker, AFP was 92.84 ng/ml, and PIVKA-II was 8850 mAU/ml. Because there was no other metastasis in the PET scan we decided surgical resection. Recurrence has not been found at CT scan during 38 months after operation. The levels of tumor markers remained normal, also.

Conclusion: LN metastases at distant sites without metastases in the hepatoduodenal ligament are relatively rare. Patients with a solitary metastasis from a controlled intrahepatic tumor can be treated surgically, and good outcomes have been reported. However, it is still difficult to decide solitary LN metastasis from hepatocellular carcinoma whether to be resected or to be received systemic treatment.

Keywords: Hepatocellular carcinoma, Single LN metastasis.

Evaluating Relationship between Location of Hepatocellular Carcinoma and Efficacy of Transcatheter Arterial Chemoembolization

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1Radiology, Nippon Medical School, 2Radiology, Ebina-Sogo Hospital, 3Radiology, Tamanagaya Hospital, 4Division of Gastroenterology and Hepatology, Nippon Medical School, 5Gastrointestinal and Hepato – Biliary – Pancreatic Surgery, Nippon Medical School, Japan

Background/Aims: The aim of this study was to evaluate the relationship between location of hepatocellular carcinoma (HCC) and efficacy of transcatheter arterial chemoembolization (TACE).

Methods: Between January 2011 and June 2014, 97 patients (107 nodules) with untreated HCC nodules received TACE with an emulsion of lipiodol and cisplatin or epirubicin. The location ratio of HCC was defined as followed: the straight line was traced through the bifurcation of the right and left branches of portal vein to the center of target nodule and the peripheral surface of liver using multi-planar reconstructed images. The location ratio of HCC was determined as a ratio of the distance from internal surface of the liver to the center of HCC/diameter of the liver on the traced line. The effect of TACE was evaluated according to Modified Response Evaluation Criteria in Solid Tumors. The location ratio of HCC was compared between complete response (CR) group and non CR group in Child Pugh A and B patients each.

Results: The median location ratio of HCC in the right lobe and caudate lobe was significantly higher (0.81 vs. 0.63, P = 0.0026) in CR group than in non-CR group in the Child-Pugh A patients. While, the median location ratio of HCC in the lateral segment and medial segment was no significant difference (0.73 vs. 0.72, P = 0.839) between CR and non-CR groups. In the Child-Pugh B patients, the median location ratio of HCC was not significantly difference between CR group and non-CR group in each lobe and segment.

Conclusion: TACE may be particularly effective in the cases of HCC located in the peripheral area of the right lobe and medial segment in patients with Child-Pugh grade A.

Keywords: Hepatocellular carcinoma, Transcatheter arterial chemoembolization.

Remnant Liver Ischemia Is Associated with Early Recurrence and Poor Survival after Liver Resection in Patients with Hepatocellular Carcinoma

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Background: The remnant liver after heptectomy may suffer from inadequate blood supply postoperatively, especially after non-anatomical resection or vascular damage. Remnant liver ischemia (RLI) may have an adverse impact on long-term survival and morbidity after liver resection.

Method: RLI was graded on postoperative computed tomographic scans in 328 patients who underwent heptectomy for hepatocellular carcinoma (HCC) between January 2004 and December 2013. We defined RLI as reduced or absent contrast enhancement during the venous phase. RLI was classified as minimal (none to mild), mild-moderate, or moderate-severe.

Results: Radiologic signs of severe RLI were found in 98 patients (29.9%), of which 63, 16, and 19 had partial, segmental, or necrotic RLI. These patients experienced more complications (P < 0.001) and longer hospital stay (P = 0.002) than patients with minimal RLI. Preoperative history of transarterial embolization (P = 0.040), use of the Pringle maneuver (P = 0.028), and longer operation time (P < 0.001) were independent risk factors for severe RLI.
The early recurrence rates within 6 or 12 months after hepatectomy were greater in patients with severe RLI than in patients without RLI (P < 0.001). RLI was an independent risk factor for overall survival (OR: 6.984; 95% CI: 3.615–7.345; P < 0.001) and disease-free survival (OR: 5.153; 95% CI: 3.615–7.345; P < 0.001).

Conclusion: Preventive management and technical refinements in hepatectomy are important to decrease the risk of RLI and to improve survival of patients with HCC.

Keywords: Reperfusion, Inflammation, Complication, Prognosis, Hypoperfusion.

Table 1. Baseline characteristics (for Abstract PP2-072)

<table>
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<tr>
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<tr>
<td>Sex (male), n (%)</td>
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<tr>
<td>Age, years</td>
<td>62.3±9.7</td>
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<tr>
<td>Etiology (A/B/C), n (%)</td>
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<td>BCLC (A/B/C), n (%)</td>
<td>0/10/60 (0/14.3/85.7)</td>
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<td>Okuda (I/II/III), n (%)</td>
<td>1/35/34 (1/40.5/48.6)</td>
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<td>Tumor volume (&gt;50%)</td>
<td>35 (50)</td>
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<td>PVT, n (%)</td>
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<td>Metastasis, n (%)</td>
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<td>Ascites, n (%)</td>
<td>37 (52.9)</td>
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<td>Encephalopathy, n (%)</td>
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<td>Prior HCC treatment history, n (%)</td>
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<td>Intrahepatic bile duct dilatation, n (%)</td>
<td>35 (50)</td>
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<td>Location (Total/Right/Left/Segment 4)</td>
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<td>Child (A/B/C), n (%)</td>
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<td>Aspartate transaminase, IU/l</td>
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<td>C-reactive protein, mg/dl</td>
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<td>Prothrombin time (INR)</td>
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</table>

Continuous variable, mean ± standard deviation.

Methods: From 2010 to 2015, total 70 received endoscopic biliary drainage for jaundice due to advanced HCC. Jaundice resolution was defined as follows; complete resolution: total bilirubin less than 2 mg/dl, partial resolution: total bilirubin decreased but >2 mg/dl.

Results: Child-Pugh class was B in 65.7% (46/70), C in 31.4% (22/70). BCLC stage was B in 14.2% (10/70) and C in 85.8% (60/70). Intrahepatic bile duct dilatation was observed in 50% (35/70) and tumor location were whole liver in 27.1% (19/70) and whole right lobe in 27.1% (19/70). Table 1 showed baseline characteristics of 70 patients. Success rate of biliary drainage was 95% (67/70). After drainage, jaundice was resolved completely in 27.1% (19/70), partially in 28.5% (20/70). The median time to resolution was 19 days (range, 2–96 days). However, in these patients, jaundice was aggravated in 74.3% (29/39) median 88 days (range, 5–399 days) after resolution. The presence of intrahepatic bile duct dilatation was significantly associated with complete resolution of jaundice in multivariate analysis (p = 0.040). In overall, 90 days survival rate was 24.2% and median survival was 30 days (95% CI; 9–50 days). Predicting factors for overall survival was jaundice resolution (p < 0.001), Child-Pugh class (p = 0.019), aspartate aminotransferase (p = 0.021) and BCLC stage (p = 0.036) in multivariate analysis, respectively.

Conclusions: Through endoscopic biliary drainage, jaundice was improved in 55.7% with advanced HCC and survival can be prolonged in patients who showed jaundice resolution. In jaundice in presence of intrahepatic bile duct dilatation, biliary drainage can be appropriate palliative treatment in advanced HCC patients.
IDFS to the TACE group. (Re-resection vs. TACE: median 57.0 m vs. 13.0 m, p = 0.021) However, there was no significant difference comparing RFA group. (Re-resection vs. RFA: median 57.0 m vs. 20.0 m, p = 0.260) (fig. 1). In multivariate analysis, the Re-resection group was still superior in IDFS to the TACE group. (Risk Ratio 95% CI: 2.35 (1.03–5.35), p = 0.043) (table 1).

Conclusion: Re-resection of recurred HCC may improve patients’ survival comparing to TACE.

Keywords: Hepatocellular carcinoma, Recurrence, Intrahepatic, Therapy modalities, Survival rate.

PP2-074
Usefulness of Laparoscopic Liver Resection for Liver Damage Degree B Patient with Hepatocellular Carcinoma
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Gastroenterological Surgery, Kumamoto University, Japan

Background: A lot of surgeons tend to perform Laparoscopic Liver Resection (LLR) because of low invasion for patients at more institution. It is still unknown to be useful to perform LLR for the patients with poor liver function. We analyzed the safety and usefulness LLR for liver damage B patients with hepatocellular carcinoma (HCC).

Patients and Methods: Liver Resection (lateral segmentectomy and partial resection) was performed to 183 patients with HCC to January, 2011 from December, 2015. 1) LLR was performed to 71 (38.8%) patients, 12 (16.9%) of those patients were liver damage B. We analyzed patient characteristics and short-outcomes between liver damage A and B. 2) Liver resection was performed to 25 patients with liver damage B, 13 (52%) of those patients were performed OLR. We analyzed patient characteristics and short-outcomes between LLR and OLR.

Results:
1) There was no significance between liver damage A and B in Age, sex, the extent of resection and the approach of resection (Pure and hybrid+HALS). The median operative time and bleeding volume according to the liver damage was 290 vs. 277 min and 59 vs. 152 ml (not significantly). In complication and hospitalization, there was no significance between A and B (1.7 vs. 8.33%; p = 0.20, 9 vs. 11 days; p = 0.085).

2) There was no significance between OLR and LLR in Age, sex, the extent of resection. The median operative time and bleeding volume according to the liver damage was 375 vs. 277 min and 307 vs. 152 ml (not significantly). In complication and hospitalization, there was no significance between A and B (15.4 vs. 8.33%; p = 0.39, 10 vs. 11 days; p = 0.66).

Conclusion: We considered that LLR was more safely and useful method for liver damage B patients competing with OLR for them or OLR for liver damage A patients.

Keywords: Hepatocellular carcinoma, Laparoscopic liver resection, Liver damage B.

PP2-075
Laparoscopic Wedge Resection for Suspected Large (≥5 cm) Gastric Gastrointestinal Stromal Tumors
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Hepatobiliary and Transplantation Surgery, Singapore General Hospital, Singapore

Background: Laparoscopic wedge resection (LWR) for small gastrointestinal stromal tumors (GIST) is now widely accepted. However, its application for large gastric GISTs remains controversial. This study aims to evaluate the feasibility and safety of LWR for suspected large (≥5 cm) gastric GISTs.

Methods: This is a retrospective review of 82 consecutive patients who underwent attempted LWR for a suspected gastric GIST at a single institution between 2002 to 2015. The patients were stratified into large (≥5 cm) (n = 23) and small (<5 cm) tumors (n = 59). The 23 patients who underwent LWR of large tumors were also compared to 36 consecutive patients who underwent open wedge resection (OWR) of large tumors.

Results: Comparison between the outcomes of patients who underwent LWR for large versus small tumors demonstrated that resection of large tumors was associated with a longer operating time [210 (150–475) vs. 140 (60–415) minutes, P < 0.001]. There was no difference in other perioperative outcomes, and oncological outcomes such as frequency of close margins (≤1 mm) and recurrence-free survival. Comparison between patients who
underwent LWR versus OWR for large tumors showed that LWR was associated with decreased median time to fluid diet [2 (1–4) vs. 3 (1–6) days, P < 0.001], decreased median time to solid diet [3 (1–9) vs. 5 (2–9) days, P < 0.001], shorter postoperative stay [4 (2–72) vs. 7.5 (4–64) days, P < 0.001] but longer operating times [210 (150–475 vs. 105 (50–245) minutes, P < 0.001]. There was no difference in oncological outcomes between LWR and OWR.

**Conclusion:** LWR for large gastric GIST (≥5 cm) is feasible and safe. It is associated with the same favorable short-term outcomes over OWR as LWR for small tumors without compromising on oncological outcomes.

**Keywords:** GIST, laparoscopy, Gastrointestinal stromal tumor.

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<th>3 year</th>
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<th>Multi p</th>
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* Reference.
study aims to evaluate the safety and feasibility of laparoscopic minor hepatectomy (LMH) in elderly patients with HCC.

**Methods:** Between 2007 to 2016, 134 consecutive patients who underwent LMH for HCC were retrospectively reviewed. A total of 40 consecutive elderly (≥70 years) patients were compared with 94 young patients (<70 years). The 40 patients were also compared with 87 consecutive elderly patients who underwent open minor hepatectomies (OMH) between 2006–2015.

**Results:** Comparison between the baseline characteristics of elderly and young HCC patients who underwent LMH showed that elderly patients were significantly more likely to have >1 comorbidity and had a higher median AFP level. Comparison between perioperative outcomes demonstrated that elderly patients were significantly more likely to have a longer operation time, increased blood loss, increased need for blood transfusion, longer Pringles duration and longer postoperative stay. Comparison between LMH and OMH in elderly patients demonstrated no significant difference in baseline characteristics except elderly patients who underwent LMH were significantly more likely to have >1 comorbidity and had a higher median AFP level. Comparison between outcomes demonstrated that LMH in elderly patients was associated with longer operation time, increased median blood loss, longer Pringles duration but decreased postoperative pulmonary complications and shorter postoperative stay compared to OMH.

**Conclusion:** LMH is safe and feasible in elderly patients with HCC. However, LMH in elderly patients is associated with poorer perioperative outcomes compared to LMH in young patients. Comparison between LMH versus OMH in elderly patients demonstrated mixed perioperative outcomes.

**Keywords:** Laparoscopic hepatectomy, Hepatocellular carcinoma, Elderly, Laparoscopic liver resection.

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**PP2-077**

Laparoscopic Liver Resection for the Patients with HCC and Chronic Liver Disease May Lead to Extending Overall Survival of the Patients

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After liver resection (LR) for HCC patients, multicentric metastatic recurved lesion with the need of repeated treatments is often occurred from the background chronic liver disease (CLD). Adequate treatment to such lesion is one of the important factors of long-term survival of the patients. Less postoperative adhesion and, also, minimum requirement to adhesiolysis in repeat LR due to good view and manipulation in relatively small operative field are among the advantages of laparoscopic LR (LLR). In this setting, LLR may be beneficial for the patients over open LR (OLR).

Among 120 LLR, we experienced 73, including 19 repeat and 6 three or more time resections, for HCC/CLD patients. Repeat LLR were performed in 10 cases after OLR. There is no patient who underwent repeat LLR of one or more section. Operation time (OT), intraoperative bleeding (OB) and postoperative hospital stay (HS) were compared in the groups of patients with first LLR (F, n = 43, excluding the resections of one or more sections and with combined resections of the other organ), repeat LLR (R, n = 19), and three or more time LLR (T, n = 6).

OT (min, median (range)) are 301 (112–606), 220 (104–580), and 211 (194–274) in the groups of F, R, and T, respectively. OB (ml) are 100 (0–3270), 50 (0–1700), and 30 (0–240) and HS (day) are 18 (8–254), 12 (8–42), and 9 (8–10). There is no statistically significant difference.

Increases of OT and OB are not observed in the groups of R and T in LLR setting, unlike in OLR. HS has a tendency to be shorter in group R, and more in T. Patients in T group show no deterioration of ICG R15 value over times. Shorter HS in this group seems to be mainly occurred by the psychologically good accessibility of the patients to LLR.

**Keywords:** Laparoscopic liver resection, Hepatocellular carcinoma, Chronic liver disease, Repeat hepatectomy.

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**PP2-078**

Usefulness of Measuring Functional Liver Volume by Using 99mTc-Galactosyl Human Serum Albumin Scintigraphy Single-Photon Emission Computed Tomography

Takafumi Kumamoto1, Yu Sawada2, Yoshio Yabushita1, Seigo Hiratani1, Gakuryu Nakayama1, Kazuha Takeda1, Kuniya Tanaka2, Ryuataro Mori1, Ryusei Matsuyama1, Hirotoshi Akiyama1, Itaru Endo1

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**Objective:** Preoperative assessment of hepatic function of future remnant liver is still a major issue in hepatobiliary surgery. We investigated the usefulness of measuring functional liver volume using 99mTc-galactosyl human serum albumin (GSA) scintigraphy-single-photon emission computed tomography/computed tomography (SPECT/CT) imaging.

**Methods:** We performed a prospective analysis of 39 patients with colorectal liver metastases or hepatocellular carcinomas, underwent hepatic resection after portal vein embolization (PVE), and evaluated their functional liver volume perioperatively with GSA SPECT/CT. The percentage of the non-tumorous remnant liver volume (%LV) and the percentage of functional remnant liver volume (%FLV) were estimated. We have been using the prediction score (PS) (Yamakata et al. Ann Surg 1994;219(4):342–6) which was consists of %LV, indocyanine green retention rate, and patient’s age for predicting postoperative liver failure. We compared the PS and modified PS (mPS) which adopted %FLV instead of %LV for prediction of postoperative liver failure using Area under receiver operatorating characteristic curve (AUC).

**Results:** %LV increased significantly, from 40.3 to 52.8%, and the increment was 5.9% greater for the %FLV compared to %LV. %FLV increased significantly, from 43.1 to 61.5%, and the increment was 18.4% (P < 0.01). The increment was 5.9% greater for the %FLV compared to that of the %LV (P = 0.01). All patients were received subsequent operation following PVE. Postoperative liver failure of grade B and C (ISLGS definition) occurred in 3 cases. AUC of PS and mPS were 0.674 and 0.913, respectively.
Background: Patients with decompensated cirrhosis have a high incidence of abdominal wall hernias with a poor outcome following the current surgical management.

Aim: To evaluate the outcome of a new technique in the repair of complicated hernias in patients with decompensated cirrhosis.

Methods: Thirty consecutive patients with decompensated cirrhosis underwent herniorrhaphy for complicated hernia. Patients were randomized into group I (New technique: A. Three layers technique (a 5 to 7 interrupted suture without tie b. Continuous suture starting 3 cm away from the angles c. Tie the previous interrupted suture over the continuous tied suture d. The third layer continuous suture to invaginate the previous sutures). B. Regular paracentesis 4 l daily (2 l every 12 h) through peritoneal drains for at least five days with replacement by human albumin and fresh Freon plasma every time., C. Spinal anesthesia using (shiba needle 27) with precaution from hypotension using Human albumin 20% 50 ml on 500 cc Ringer acetate plus two fresh frozen plasma during induction n = 15) and group II (non-anatomical repair, n = 15).

Post-operatively, patients were followed for one year. Results: Patients were comparable between groups I and II regarding age (48.27 ± 9.51 vs. 44.33 ± 9.98, P = 0.279), sex [12 males (80%) vs. 12 males (80%), P = 1], grade of ascites [moderate: 3 (20%) vs. 11 (73.3%), and marked: 12 (80%) vs. 4 (26.6%), P = 0.003], respectively. Both wound dehiscence and post-operative wound leakage (ascitic fluid) were significantly lower in group I compared to group II [0% vs. 5 (33.3%), P =<0.005 and 0% vs. 8 (53.3%), P = 0.003, respectively]. In concern to morbidity there is significant difference between group I and II (negative in GI 11 (73.3%) vs. 5 (33.3%) in GII (P = 0.028). The grade of ascites was significantly reduced in group I vs. group II [marked: 0% vs. 7 (46.7%), P = 0.003]. Postoperative hematemesis was significantly lower in group I than group II (negative in 15 (100%) in G I vs. 7 (46.7%) in GII and P = 0.003)). Postoperative hospital stay was significantly shorter in group I vs. group II (6.5 ± 4.0 vs. 12.8 ± 3.0, P < 0.0001). Hernia recurrence was lower in groups I than II at 6 months [no recurrence in GI 13 (86.6%) vs. G II 5 (35.7%), P = 0.014, and no recurrence in GI, 11 (73.3%) vs. G II 4 (28.57%), P = 0.011 respectively].

Conclusion: The use of the new technique of hernia repair was associated with a significant reduction in wound leakage (ascitic fluid), wound dehiscence, hospital stay, morbidity and recurrence in patients with decompensated cirrhosis presenting with complicated abdominal hernia.

Keywords: Hepatic resection, Neutrophil elastase inhibitor.

PP2-080
Can Neutrophil Elastase Inhibitor Improve Postoperative Outcomes in Liver Resection?

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Digestive Surgery, Nihon University School of Medicine, Japan

Background: Neutrophil elastase inhibitor (NEI) is known reducing the respiratory complications in thoracic surgery. Based Moreover, NEI may have a good response for avoiding ischemia reperfusion injury in liver resection.

Objectives: The current study aimed to examine the impact of NEI on the postoperative outcomes after liver resection.

Patients and Methods: The data were collected from 374 consecutive patients scheduled to undergo liver resection. Seven peri-operative variables were matched on the basis of the patients’ background. Then, the NEI (n = 61) and control (n = 61) groups were compared. NEI was administered at a dose of 0.2 mg/kg/h for three days from the postoperative day 0 (POD0). The liver function, coagulation activity, inflammatory response, respiratory complications, and overall complications were compared.

Results: The levels of serum interleukin-6 (NEI group: 113 pg/ml [26.9–522.0] vs. control group: 174 [28.6–1040.6], P < 0.01) and C-reactive protein (CRP) (2.9 IU/L [range: 0.1–8.6] vs. 4.11 [0.3–13.8], P = 0.01) on the first postoperative day (POD1) and the alveolar-arterial oxygen tension difference (32.3 Torr [-28.6–132.3] vs. 46.6 [-11.2–251.6], P = 0.04) on the third postoperative day (POD3) were significantly lower in the NEI group than the control group. The rate of pleural effusion was significantly lower in the NEI group compared to that of the control group [13 patients (21.3%) vs. 23 (37.7%), P = 0.04]. However, the coagulation activities (P = 0.68), liver function (P = 0.69), non-respiratory complications (P = 0.84), and overall complications (P = 0.71) did not differ significantly between the groups.

Conclusions: NEI administration had positive impact on the postoperative inflammatory response and oxygenation while it did not affect either coagulation or the liver function, as well as severe grade complications.

Keywords: Complication, Liver resection, Neutrophil elastase inhibitor.
PP2-081
Primary Hepatic Schwannoma Mimics Cystadenoma of the Liver: A Case Report
Hidetaka Arima, Shintaro Yamazaki, Yusuke Mitsuka, Tadatoshi Takayama
Digestive Surgery, Nihon University School of Medicine, Japan

Introduction: A primary schwannoma of the liver is rare entity and hard to diagnose preoperatively. We encountered a primary schwannoma which misdiagnosed to as a hepatic cystadenocarcinoma.

Case Presentation: A 51-year-old female was admitted to our hospital because of a 93 mm tumor in Segment 4 of the liver. The tumor had a solid component in the cystic mass and had a partial enhancement in arterial phase on CT. The tumor was preoperatively diagnosed as a hepatic cystadenocarcinoma and underwent liver resection. At operation, intraoperative ultrasound sonography confirmed a solid part of the tumor in the 77 mm cystic mass. There were no the other intra-abdominal and lymph node metastasis. The left liver resection was performed without biliary reconstruction. On gross findings, the tumor had a firm capsule and had yellowish solid part. There were multiple segmentation in the cystic part.

Pathologically, the Antoni A hypercellular and Antoni B hypocellular area were observed in a complex. Immunohistochemical staining revealed that a strong positive S-100 protein reaction was diffusely observed in the solid part of the tumor. The MIB-1 index was less than 5%. However, the desmin, α-smooth muscle actin, CD34, c-kit and cytokeratin (AE1/AE3) staining was all negative. Finally the tumor was diagnosed as primary hepatic schwannoma. The patient has been of attention as precursor lesion of cholangiocarcinoma. The mild to middle biliary intraepithelial neoplasia was found around the pseudo tumor.

Conclusion: We encountered an inflammatory pseudo tumor of the liver which coexistence of biliary intraepithelial neoplasia around the tumor. Such borderline tumor like present case, the surgical treatment is justified.

Keywords: Biliary intraepithelial neoplasia, Inflammatory pseudotumor.

PP2-082
Inflammatory Pseudo Tumor Mimics Cholangiocarcinoma of the Liver: A Case Report
Yusuki Ohkuma, Shintaro Yamazaki, Yusuke Mitsuka, Nao Yoshida, Tadatoshi Takayama
Digestive Surgery, Nihon University School of Medicine, Japan

Introduction: Biliary intraepithelial neoplasia (BilIN) is a new concept for the microscopic biliary cell atypia with intraductal papillary lesion defined by WHO in 2010. The high grade atypia has been of attention as precursor lesion of cholangiocarcinoma.

Case Presentation: A 61-year-old man was admitted to treat a 40 mm irregular solid mass in the paracaval portion of the caudate lobe. He has a history of advanced gastric cancer and was underwent total gastrectomy. The mass was found in the course of follow up and it increased in size twice in 6 months. The abdominal CT showed that the non-enhanced irregular tumor was invaded widely to the inferior vena cava, middle hepatic vein and left hepatic vein. The MRI and PET confirmed this tumor as a malignant lesion. The laboratory examination is nonspecific and there was no elevation of tumor markers. The tumor was diagnosed to the cholangiocarcinoma or liver metastasis from gastric cancer and was performed extended left lobectomy. Under the side clump of IVC, a part of IVC was resected. Pathologically, there was no finding of malignancy and the tumor was diagnosed as inflammatory pseudo tumor of the liver. The mild to middle biliary intraepithelial neoplasia was found around the pseudo tumor.

Conclusion: We encountered an inflammatory pseudo tumor of the liver which coexistence of biliary intraepithelial neoplasia around the tumor. Such borderline tumor like present case, the surgical treatment is justified.

Keywords: Biliary intraepithelial neoplasia, Inflammatory pseudotumor.

PP2-083
The Long Term Prognosis of the Patients with Initially Unresectable Colorectal Liver Metastases Converted to Resectable Disease by Chemotherapy
Daisuke Kudo, Keinosuke Ihido, Norihisa Kimura, Taiichi Wakiya, Kenichi Hakamada
Gastroenterological Surgery, Hirosaki University Graduate School of Medicine, Japan

Background: Innovation of systemic chemotherapy for advanced colorectal liver metastases (CRLM) have increased chance of hepatectomy.

Methods: One hundred ten cases received hepatectomy for CRLM between 2000 and 2012 were evaluated. Patients with future liver remnant less than 30% or uncontrollable extrahepatic disease were considered as initially unresectable.

Results: Twenty cases were diagnosed as initially unresectable, and all of them received oxaliplatin or irinotecan regimen combined with molecular targeting agents. Overall survival rate in the patients with unresectable disease were 45.0% at three year after hepatectomy, and were 6.0% at five year (p = 0.002). Three-year relapse free survival rate of the unresectable cases was 0%, on the other hand, that of resectable cases was 38.5% (p = 0.003). Recurrence in the remnant liver was observed in 18 patients with unresectable disease. Non-tumoral liver parenchyma were histopathologically evaluated for the detection of chemotherapy associated liver damage. All of cases with unresectable disease had sinusoidal obstruction or steatohepatitis, where patients with resectable disease had fewer liver damage (22.5% and 31.4%, respectively, p = 0.013).

Conclusion: Patients with conversion disease should be receive hepatectomy without continue of chemotherapy under the consideration of non-tumoral liver parenchymal damage.

Keywords: Colorectal liver metastases, Hepatectomy, Chemotherapy.
**PP2-084**

Simultaneous Resection for Colorectal Cancer with Synchronous Liver Metastases

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**Background:** The traditional staged resection for patients presenting with synchronous colorectal liver metastases (SCLM) has been shift to simultaneous resection recently in many center. But, the optimal surgical strategy for treating colorectal cancer liver metastases (CRLM) in patients requiring major liver resection (MLR) is controversial, especially in left sided and rectal cancer patients.

**Methods:** Our strategy has been offer simultaneous resection for patients with resectable hepatic metastases regardless of the location of primary tumor since 2007. A retrospective review of 96 patients undergoing simultaneous liver resection for SCLM between 2007–2015 was performed. Patients were divided into three groups according their location of primary tumor: group A (right colon or transvers colon), group B (left colon or sigmoid colon), group C (rectum).

**Results:** Location of liver metastases, type of hepatectomy, surgical margin status, concomitant extra hepatic metastases, primary tumor T and N stage distribution was similar and not shown any statistical differences between the groups (p > 0.05). Receiving preoperative chemotherapy was significantly higher in primary with rectal cancer group (p < 0.05). Transfusion of RBCs, ASA score, anastomotic failure has not shown any statistical differences between the three groups (p > 0.05).

**Conclusions:** Due to advances in surgical techniques and enhancements in anesthesia and critical care, the safety and efficacy of simultaneous resection of colorectal and liver tumor have improved. And, can be carried out without excess morbidity in carefully selected patients; regardless of the location of the primary tumors and type of hepatectomy.

**Keywords:** Liver, Colorectal metastases.

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**PP2-085**

Feasibility, Safety and Faults of Simultaneous Colon Resection with Split in Situ Hepatectomy among Synchronous Colorectal Liver Metastases Patients

Ivan Rebeko1, Nikolaj Suslov1, Anatolij Lobinsky1, Dzianis Michnuk2, Dmitry Chizh2, Feliks Erzinkiani1, Eugenij Semakov2, Vladimir Tatarkinovich2, Georgij Trizno2

1Abdominal Oncological Department, N.N. Alexandrov National Cancer Centre, 2Oncological Coloproctological Unit, N.N.Alexandrov National Cancer Centre, Belarus

**Background:** Most consensuses recommend carrying out neoadjuvant chemotherapy as first-line treatment of borderline resectable or high-risk synchronous colorectal cancer liver metastases (SCRCLM), despite losing up to 30% of patients due to chemotherapy failure or chemotherapy-associated liver injury. Furthermore, no data of simultaneous colorectal resection and split hepatectomy in resectable SCRCLM performance without previous chemotherapy is found in the papers. The aim was to estimate feasibility, safety and faults of colorectal resection simultaneously with associating liver partition and portal vein ligation for staged hepatectomy (ALPPS), or right in situ split hepatectomy in SCRCLM.

**Method:** Nine included patients had symptomatic tumor and SCRCLM. The average age of patients was 59 ± 6.7 years. ALPPS was performed in 3 cases, in situ right hepatectomy – in 6. The 1st surgery stage comprised colorectal resection and first step of hepatectomy (nonanatomical resection of left liver with/without RFA, liver partition and right portal vein branch ligation). The 2nd surgery comprised right lobectomy or hemihepatectomy conducted after an interval.

**Result:** Median number of metastases was 10 (from 4 to 28) with average maximum size – 12.8 ± 6.7 cm. Duration of the 1st surgical stage was 348.9 ± 57.6 and 197.8 ± 50.6 minutes for 2nd. Average blood loss was 496.7 ± 279.0 and 650.0 ± 165.8 ml for 1st and 2nd stages respectively. The average interval between two stages was 37.2 ± 13.7 days. According to Dindo-Clavien classification, postoperative 3–5 grade complications were observed in 4 cases: biliary fistula, peritonitis, and abscess with liver insufficiency after two-stage hemihepatectomy resulting in 1 death within 90 days after 2nd surgery stage.

**Conclusion:** Despite great technical difficulty of simultaneous colorectal resections with split hepatectomy or ALPPS, this strategy enables to reach R0 resection with acceptable mortality and postoperative complications rate in SCRCLM with high probability of chemotherapy failure.

**Keywords:** Simultaneous colon resection, Split in situ hepatectomy, Colorectal liver metastases, Colorectal cancer, Neoadjuvant chemotherapy.
**PP2-086**

**Negative Impact of Skeletal Muscle Loss after Preoperative Chemotherapy in Patients with Colorectal Liver Metastasis**

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Department of Gastroenterological Surgery, Graduate School of Medical Sciences, Kumamoto University, Japan

**Background:** In colorectal liver metastasis, the hepatectomy is the only radical treatment. On the other hand, there is several report that sarcopenia is related to prognosis in colon cancer.

**Aim:** The aim of this study is to examine the relation between prognosis and the change of sarcopenia after preoperative chemotherapy in patients with colorectal liver metastasis.

**Method:** From January 2003 to April 2016, 44 patients with colorectal liver metastasis who received preoperative chemotherapy were enrolled in this study. I measured the skeletal muscle of the L3 level using the CT within one month in operation and in start of chemotherapy.

**Results:** Of 44 patients, 28 men and 16 women were enrolled in this study. Patients’ median age was 63 (42–82) years old with 28 men, woman 16. The primary tumor site was 23 in colons and 21 in rectum. Thirty-three cases were synchronous and 11 cases was metachronous liver metastasis. The median skeletal muscle before chemotherapy was 54.7 (42.7–76.4) cm²/m², and after chemotherapy was 53.2 (41.4–70.7) cm²/m². The relationship between prognosis and sarcopenia in pre- and post-chemotherapy was not recognized. It was recognized that the tendency in patients with more than 20% decrease of skeletal muscle were poor prognosis (p = 0.074).

**Conclusion:** In patients with colorectal liver metastasis received preoperative chemotherapy, skeletal muscle loss may predict prognosis. The further study is needed to clarify the relation between prognosis and skeletal muscle loss.

**Keywords:** Sarcopenia, Visceral fat, Colorectal liver metastasis.

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**PP2-087**

**A Review of Liver Resection for Colorectal Liver Metastasis in Elderly**

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**Background:** Life expectancy in the world in generally increasing. Being the most common cancer in Hong Kong, the percentage of elderly patient having colorectal cancer has been increasing. Resection of the tumors provide the best tumor control. However, data evaluating the outcome of elderly patients having liver resection is lacking. The aim of this study is to review the survival of liver resection in elderly patients having colorectal liver metastasis (CLM).

**Methods:** Clinical data of patients who had liver resection for CLM was prospectively collected. A total of 222 patients in the period of 1999–2016 were included. They were divided into two groups according to their age (<70 or ≥70 years old). Overall survival and disease free survival were calculated.

**Results:** A total of 222 patients were included. 51 patients (23.0%) were in the elderly group. Baseline characteristics were similar, except patients in elderly group having more co-morbidities (p = 0.012). 1-year overall survival were 94.4% and 90.4% for the ‘young patient’ group and ‘elderly patient’ group respectively. 5-year overall survival were 45.9% and 40.8% (p = 0.138) in ‘young patient’ group and ‘elderly patient’ group respectively. The 5-year disease free survival were 29.4% and 12.1% (p = 0.669) in ‘young patient’ group and ‘elderly patient’ group respectively. Both overall and disease free survival showed no statistical difference.

**Conclusion:** Resection of CLM in elderly patients is feasible with similar survival compared with younger patients group. It should be considered in selected patients to provide the best oncological outcome.

**Keywords:** Liver resection, Colorectal liver metastasis, Elderly.

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**PP2-088**

**Laparoscopic Combined Colorectal and Liver Resection for Primary Colorectal Cancer with Synchronous Liver Metastases**

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Nowadays regarding a personalized multimodal approach laparoscopic liver (including major resections) and colorectal resections, separately distinguished, are accepted as feasible, safe and oncologically equivalent to open resections surgical methods of treatment for colorectal carcinoma. However, there is still no consensus, regarding the applicability of combined laparoscopic colon and liver resection in primary colorectal cancer with synchronous liver metastases. The aim of the present study is to determine the feasibility of combined different volume laparoscopic colon and liver resection at selected patients with primary colorectal cancer and synchronous liver metastases.

From April 2014 to April 2016 nine patients with primary CRC and a clinical diagnosis of SLM underwent combined totally laparoscopic or ‘hybrid’ liver and colorectal surgery. Patient and tumor (primary and metastatic) characteristics, operative variables, and postoperative outcomes were evaluated prospectively.

The primary tumor was located at colon in 6 patients and at rectum in 3 patients. The synchronous liver metastasis was solitary in 6 patients and multiple in 3 patients. Surgical approach was totally laparoscopic in 7 patients, ‘hybrid’ technique was applied in 2 patients. The major hepatic resections were 2 right hepatectomies in combination with resection of sigmoid colon and left colectomy. Median operation time was 288 min, with a mean blood loss of 125 ml for the combined major liver resections and 70 ml for the group with minor liver resections. The average postoperative hospital stay was 9,1 days. Postoperative complications
were observed in two patients (grade IIIa and IIIb, respectively). Mortality rate was zero. R0 resection was achieved in six patients, but one in which the first stage of two stage liver resection was performed.

Simultaneous laparoscopic colorectal and liver resection appears to be feasible in selected patients with CRC and SLM on providing an adequate preoperative selection and combined surgical expertise.

**Keywords:** Simultaneous laparoscopic colorectal and liver resection, Major laparoscopic resections, Colorectal cancer, Synchronous colorectal liver metastases.

**PP2-089**

**Complications and Mortality after Adult to Adult Living Donor Liver Transplantation: A Retrospective Cohort Study**

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1Hepatobiliary Surgery, National Liver Institute, Menoufiya University, Egypt, 2Anaesthesia, National Liver Institute, Menoufiya University, Egypt, 3Hepatology, National Liver Institute, Menoufiya University, Egypt, Arab Republic

**Background and Aims:** Living donor liver transplantation (LDLT) is widely performed for patients to resolve the critical shortage of organs from cadavers. Despite rapid implementation of the procedure, both complications and mortality of LDLT are annoying problems. The aim of this study was to analyze complications and mortality of patients after adult to adult LDLT (A-A LDLT) in a single center.

**Methods:** The study included 161 (A-A LDLT) patients who had operations between April 2003 and February 2013 after exclusion of mortality due to intra-operative bleeding. We retrospectively analyzed the pre-, intra- and post-operative factors that may influence patient outcome in the department of hepatopancreatobiliary (HPB) surgery, national liver institute (NLI), university of Menoufiya, Menoufiya, Egypt, in the period from the beginning of 2013 to the end of 2015.

**Results:** The overall incidence of complications was 86.2% (n ¼ 144) and classified as biliary 43.7% (n ¼ 73), vascular 21.6% (n ¼ 36), Small for size syndrome (SFSS) 12.6% (n ¼ 21), Gastrointestinal tract (GIT) 19.8% (n ¼ 33), wound 12.6% (n ¼ 21), chest 19.8% (n ¼ 33), neurological 26.3% (n ¼ 44), renal 21% (n ¼ 35), intra abdominal collection 21.6% (n ¼ 36), recurrent hepatitis C virus (HCV) 16.8% (n ¼ 28), recurrent hepatocellular carcinoma (HCC) 2.4% (n ¼ 4), acute rejection 19.2% (n ¼ 32), 65 (45.1%) of 144 complicated patients died, while 10 (43.5%) of 23 non complicated died. The incidence of whole, in hospital and late mortalities were 44.9%, 28.7% and 16.2% respectively.

**Conclusions:** Mortality was higher among complicated cases where vascular complications and SFSS had significant effect on it so prevention and treatment of them is required for improving outcome.

**Keywords:** Living donor liver transplantation (LDLT), Outcome post LDLT, Complications after LDLT, Mortality after LDLT.

**PP2-090**

**Deceased Donor Liver Transplantation Using a Lacerated Graft with Isolated Hyperbilirubinemia: Case Report with Review of Literature**

Seong uk Kwon, YoungRok Choi, Ho-Seong Han, Yoo-Seok Yoon, Jae Young Cho, Jae Seong Jang, Seongho Kim, Jangkyu Choi

Surgery, Seoul National University Bundang Hospital, Korea

The main limitation of liver transplantation is the shortage of organ donors. The big gap between supply and demand exist in liver transplantation. The scarcity of donor has led to the increased use of marginal grafts.

An injured liver, especially lacerated, is generally considered as the marginal graft having high risk, poor outcome. Because it is susceptible for malfunctioning, bleeding, bile leakage and infection after liver transplantation.

However, some authors have reported successful liver transplantation using injured graft under the meticulous care and careful selection of recipient. We report a case of successful liver transplantation using a right liver graft after in situ left hepatectomy with a lacerated graft with hyperbilirubinemia.

**Case:** Recipient was 52 years old male with alcoholic Liver cirrhosis patient. And he was admitted because of esophageal variceal bleeding. At that time MELD score was 27 and Child Pugh score was 11.

The donor was a 23 years old male who had multiple injury from fall down injury (24 m height). Emergency laparotomy was performed for intraabdominal bleeding. But his condition was deteriorated to brain death. Liver function test revealed high bilirubin level (6.04 mg/dl) and elevated AST/ALT Levels (213/224 U/L).

The graft liver has 5 cm vertical linear laceration in the inferior surface of segment and it was sutured by Nylon 1-0 in the previous laparotomy. Procurement team decided to performed Lt. hemihepatectomy to discard an injured left liver.

Authors did harvest only right Liver because of we supposed that Left main bile duct was obstructed by repairing suture. After Liver transplantation using a right graft, Liver function was normalized and he discharged without any major complication.

**Keywords:** Lacerated graft.

**PP2-091**

**Use of Marginal Graft in Living Donor Liver Transplantation**

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1Digestive Surgery, Nihon University School of Medicine, 2Hepato-Biliary-Pancreatic-Transplantation Surgery, Japanese Red Cross Medical Center, Japan

A 57-year-old woman with familial amyloid polyneuropathy (FAP) was scheduled to undergo living-donor liver transplantation (LDLT), but the operation was cancelled because the only potential donor had chronic alcohol-related liver disease (ALD). One
year later, FAP-related neurological symptoms progressed rapidly, and emergency LDLT was planned. The donor’s hepatic function had returned to normal range after 1 year of abstinence. The left liver graft volume was equivalent to 37.7% of the standard liver volume (SLV) of the recipient. However, a liver biopsy revealed mild fibrosis (score: F1). LDLT was successfully performed without any complications. The recipients’ neurological findings returned to normal. One year after LDLT, the liver graft volume was equivalent to about 90% of the SLV, and the fibrosis had improved. LDLT using a graft with a fibrosis score of up to F1 might be an acceptable alternative for recipients with normal hepatic function.

Keywords: Liver transplantation, Marginal donor, Fibrosis.

PP2-092
Evaluation of New Technique of Intimal Fixation for Hepatic Artery in Living Donor Liver Transplantation

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1Surgical Department, Gastroenterology Surgical Center Mansoura, Egypt, 2Radiology, Gastroenterology Surgical Center Mansoura, Egypt

Background: In living-donor liver transplantation (LDLT), reconstruction of the hepatic artery is challenging because the recipient artery is located deep in the abdominal cavity and the operating field is limited. Hepatic arterial thrombosis (HAT) after liver transplantation is a life-threatening event associated with a high rate of graft loss or death.

Patients and Methods: From May 2004 to April 2016, 430 LDLT were done in our center. 427 single and 3 cases double anastomosis median diameter of donor hepatic artery 2 mm (1–3 mm). Rt hepatic artery branch is used in most cases intimal dissection was found in 19 cases. Intimal fixation using one, two or 3 quadrant fixation suture from inside out using 8/0 proline was done, combined with edge sutures in 3 cases with grade 4 dissection. 5 cases were anastomosed without fixation.

Results: Intimal fixation was successful in 9 cases with excellent Doppler and angiographic picture in suspected cases. 2 cases failed and splenic artery interposition graft was used hepatic artery thrombosis occurred in 1% in our series.

Conclusion: Intimal fixation of dissected hepatic artery was successful in more than 80% using our technique of combined fixation and decrease shift to interposition grafts and more pedicle dissection with implication in biliary complications.

PP2-093
A Comparison of SUV in PET CT and Laboratory Results Indicating Insulin Resistance before and after the Palliative Gastrojejunostomy: A Retrospective Study

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Aim: The purpose of the study was to compare the laboratory results indicating insulin resistance and standardized uptake values (SUVs) in PET-CT at jejenum before and after the palliative gastrojejunostomy.

Methods: A retrospective chart review over 10 years (2006–2015) of all palliative gastrojejunostomy with PET CT was done. Fifty patients who performed palliative gastrojejunostomy with PET CT which was taken before and after the surgery or after the surgery were included in this study. SUV calculations were performed by drawing region of interest encompassing the entire hot spot at jejenum level where the anastomosis site after the surgery on the PET CT console. The laboratory results, which were written in the chart, indicating insulin resistance included serum glucose, total cholesterol, HbA1c & serum insulin. A linear mixed model was applied to investigate the variation of the laboratory results.

Results: There was not a significant difference between SUV at jejenum before and after the surgery. There were difference in glucose level (p = 0.014) and cholesterol level (p = 0.039) between before the surgery and after the surgery by linear mixed model.

Conclusions: This analysis demonstrates that serum glucose and serum total cholesterol level were down graded after gastrojejunostomy as it was seen in other studies about control of diabetes after bypass surgery. While a difference of SUV at Roux limb after Roux en Y gastric bypass surgery in rodent model, there was not a significant difference of SUV in human.

Keywords: Palliative gastrojejunostomy, PET CT, SUV, Glucose.

PP2-094
A Comparative Study between Stapled and Handsewn Intestinal Anastomosis in Emergency Surgery

Mebin Mathew, Anandan Prem Kumar
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Introduction: The use of stapling devices has increased in recent years with the introduction of new and reliable disposable instruments. Previous studies comparing stapled and hand sewn anastomosis have been equivocal. New studies are necessary to clear the ambiguity. Furthermore, most studies have tested the staples in elective setup, which usually gives good results as the general condition and bowel is good. But in emergency the situation is different and difficult, which demands much more exploration and evidence on the reliability of staples.
Methodology: This study evaluates the efficacy and to compare the rates of anastomotic complications (leak/intra-abdominal abscess) of intestinal anastomosis in emergency surgeries with the two methods, Stapled & Hand sewn anastomosis. A total of 110 cases that meet the inclusion and exclusion criteria are included from Victoria Hospital and Bowring and Lady Curzon Hospital associated to Bangalore Medical College and Research Institute, Bangalore, Karnataka, India for a duration of 18 months November 2014 to April 2016.

Results: The data revealed few statistically significant differences like as in operative time and user/surgeon friendliness. But in regard to others like leakage rates, appearance of bowel sounds resumption of oral feeds, post-operative hospital stay, they remained almost identical.

Conclusion: It is concluded by this study that both hand sewn and stapler anastomosis can be performed safely with added advantage of shorter operating time for stapler anastomosis. The ambiguity about the different results in both the group were cleared in many aspects. The other factors involved in emergency setup like the general condition of the patient, the pre op albumin level, hemoglobin levels were highlighted. Further large studies are indicated.

Keywords: Anastomosis, Emergency, Staples, Hand sewn, Leakage.

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**PP2-095**

**Post-Incisional Ventral Hernia Repair in Patients Undergoing Chemotherapy: Improving Outcomes with Biological Mesh**

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**Backgrounds/Aims:** Patients requiring ventral hernia repair during peri-operative chemotherapy have a higher risk for post-operative complications. The aim of the study was to perform a case-controlled analysis in patients undergoing chemotherapy who underwent ventral hernia repair using biological mesh or synthetic mesh.

**Methods:** From January 2013 to December 2015, thirty-two patients within 8 weeks from chemotherapy administration, were treated electively for VH repair using a biological mesh (BIO-MESH). A control group receiving chemotherapy within the same time interval and treated with synthetic mesh was selected. There were no differences regarding sex, age, ASA Score III, BMI and size of the defect. Morbidity, type of complications and recurrence rate were investigated and compared between the two groups.

**Results:** In the BIOMESH Group, 8 patients (25%) experienced complications. Wound dehiscence occurred in 4 (12.5%) patients and were treated conservatively. Only 3 small seromas not requiring treatment were observed. The Control Group presented a higher mean Clavien-Dindo complication grade (1.94 ± 0.44 vs. 1.63 ± 0.52; p = 0.13), and a higher incidence of wound dehiscence (n = 9/32 28.1% vs. n = 4/32 12.5% p = 0.11). Five patients developed seroma, treated by wound drainage. One patient experienced an intra-abdominal collection treated by percutaneous drainage. At the univariate and multivariate analysis use of traditional mesh, BMI and the ASA III were predictive factors of post-operative complications. Two patients (6.3%) developed a Ventral Hernia recurrence only in the Control Group.

**Conclusions:** Biological meshes could be considered a valid option to improve post-operative short-term outcomes in selected high-risk patients undergoing chemotherapy treated for ventral hernia repair.

**Keywords:** Ventral hernia, Biological mesh, Chemotherapy, Wound complication.

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**PP2-096**

**Risk Factors Associated with In-Hospital Complication Post Gastrointestinal, Pancreatic, Hepatic Cancer Surgery: A Retrospective Case Control Study (RAPHA Study)**

Nestor Subong Jr., Guntur Darmawan, David Raymund Salvador, Margrette Ruth Bernardo

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**Background:** Worldwide, gastrointestinal, pancreatic and hepatic malignancies remain a public health issue. Up to now, there is no scoring system specifically used to assess possible complications of post gastrointestinal, pancreatic hepatic cancer surgery pre-operatively. This was the first study study aimed to develop a scoring system predicting in-hospital complication post gastrointestinal pancreatic hepatic cancer surgery in adult patients.

**Methods:** This is a retrospective case control analytic study included 285 adult patients (142 cases, 143 controls) who underwent gastrointestinal pancreatic hepatic cancer surgery from 2010 to July 31, 2014 at a tertiary, teaching hospital in the Philippines. Cases are patient who developed complications post-operatively including death, acute kidney injury, arrhythmia, hospital acquired pneumonia, surgical site infection and sepsis or septic shock. Variables were evaluated in the univariate and multivariate analysis. Calculation of specific score from the resulting factors was performed by logistic regression analysis to develop the scoring system and to determine the best score in predicting in-hospital complications.

**Results:** Out of 142 patients with post-operative complications, factors significantly associated with complications were as follows: age ≥75 years (p = 0.002), low serum albumin (p = 0.00), abnormal ECG findings (p = 0.036) and emergency surgery (p = 0.000). The proposed formula was RAPHA Score = (1.4 x Age ≥75) + (2.1 x Albumin non normal) + (0.6 x ECG findings) + (2.1 x Emergency Surgery). Based on the obtained formula, risk levels with equivalent scores were then determined with corresponding p values: 0.00–2.0 Low risk (n = 35, 24.31% p = 0.0001), 3–4 Moderate risk (n = 81, 71.05%, p = 0.0001) and 5–6 High risk (n = 26, 96.30%, p = 0.0001).

**Conclusions:** It is concluded by this study that both hand sewn and stapler anastomosis can be performed safely with added advantage of shorter operating time for stapler anastomosis. The ambiguity about the different results in both the group were cleared in many aspects. The other factors involved in emergency setup like the general condition of the patient, the pre op albumin level, hemoglobin levels were highlighted. Further large studies are indicated.

**Keywords:** Anastomosis, Emergency, Staples, Hand sewn, Leakage.
Conclusion: The RAPHA scoring system may serve as a promising aid in predicting morbidity and mortality among patients who will undergo gastrointestinal, pancreatic and hepatic cancer surgery.

Keywords: RAPHA, Rapha score, Cancer surgery.

PP2-097
Outcomes of Metastatic Neuroendocrine Tumors with Cape-Tem Regimen: A Retrospective Tertiary Care Centre Analysis
Nikhil Pande, Vikas Ostwal, Arvind Sahu, Anant Ramaswamy, Bhavesh Poladia, Shailesh Shrikhande
Medical Oncology, Tata Memorial Hospital, India

Introduction/Background: The utility of cytotoxic chemotherapy for advanced or metastatic gastro-entero-pancreatic-neuroendocrine tumors (GEP) continues to be debated. No consensus exists with regards to chemotherapeutic regimensas per standard published guidelines.

Methods: This is a retrospective analysis of prospectively maintained database of 22 consecutive patients of advanced/metastatic moderately differentiated GEP (mib index 3 to 30%) treated in our centre with Capecitabine-TMZ during the period, October 2014 to February 2016. Criteria for starting Cape-Tem Regimen included higher Mib index, non DOTA avid disease, FDG avid disease and progression after prior therapy. Tolerability, response rates and early outcomes were analysed in these patients.

Results: Of the 22 patients, the commonest primary was in pancreas (40.9%). The disease was DOTA avid in 16 (72.7%) while 4 (18.2%) had no or low grade uptake on DOTA scan. FDG avidity was seen in 63.6% cases. All patients had at least liver metastasis. Reasons for starting Cape-Tem in these patients included FDG avid disease in 41%, progression after 1st line therapy 41% DOTA non avidity in 13.6%. Six patients (27.3%) received sequential PRRT and Cape-Tem regimen (both DOTA and FDG avid). Median number of cycles administered was 4. Response evaluation has been done in 13 patients with four patients (18.2%) achieving a partial response, 7 (31.8%) having stable disease (clinical benefit rate: 50%) and 2 (9.1%) patients showing progressive disease. Median follow up duration was 9 months. The median PFS was 14.7 months. Common Gr3/4 toxicity were seen in 5 (23%) patients and were commonly vomiting, anaemia, thrombocytopenia and diarrhoea.

Conclusion: CAP-TEM is well tolerated, active with good clinical benefit and may prolong survival in patients with metastatic NET both in the first line and second line.

Keywords: Neuroendocrine tumor, Capecitabine-temozolomide, GEP tumor.

PP2-098
The Improvement of Surgeon’s Treatment in Our Hospital to Increase the Number of Young Surgeon
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Introduction: The number of surgeons has been decreasing, possibly due to unfavorable working conditions compared to other departments. To increase the number of young surgeons, our hospital has implemented several strategies to encourage young doctors to adopt surgery as a profession. In this paper, we propose a strategy for the encouraging the next generation of doctors to pursue surgery as a specialty.

Method: Our hospital performs almost 2000 operations in the surgery department. To maintain competitiveness for our busy hospital, it is important to recruit young surgeons into the workforce. To attract young doctors to a surgery specialty, two strategies are suggested.

First, the period of surgery training is a mandatory six months in our resident program; however, many young doctors have finished their initial training program without experiencing surgery training in many Japanese hospitals. To realize the importance of surgery, it is important to be exposed to a surgery rotation during initial training. Experiences of surgery training have changed young doctors’ impressions of surgery from merely a difficult specialty to a rewarding career path.

Second, surgical staff are expected to work tirelessly. Young doctors will likely decide their specialty based on the current senior doctors’ lifestyle: if senior doctors are fulfilled in their work, young doctors will more readily select the same route. Many trial measures have been implemented as follows: 1) a provision that surgeons can go home the day after working on duty, 2) a buddy system allowing surgeons to help each other, 3) a financial incentive of 10% of the operation fee, 4) reimbursement for presenting at congresses, etc.

Result: Many young doctors have selected surgery specialization. Surgical stuff are satisfied with the current status.

Conclusion: Strategies have been implemented to successfully change surgeon treatment and increase the number of young surgeons.

Keywords: Surgeon’s treatment, Resident program, Surgery rotation, Buddy system, Incentive.
PP2-099
How Natural Enterosbents Bentonite and Kaolin Clays Benefit Wounds Healing
Sviatoslav Mykytiuk, Volodymyr Tavokin, Sergii Misiak

Background: The variety of wound types has resulted in a wide range of wound dressings with different medicines frequently introduced to target all aspects of the wound healing process. A novel wound dressing based on polymer hydrogel with bentonite or kaolin clay is a good alternative. Natural ‘healing’ clays can cleanse and heal the different wounds.

Aim: To present the first results of wounds treatment by hydrogel dressing with bentonite and kaolin clays.

Materials and Methods: Both laboratory SSK ‘Harmonia’ and Department of Organic Chemistry of Lviv Polytechnic National University developed and then private company ‘Ukrtechmed’ (Ukraine) started production of hydrogel-impregnated polypropylene mesh ’Arma-Gel+’ saturated different drugs. Hydrogel dressing was applied at 30 patients (average age 54 ± 12 years) to treat burns, bleeding wounds, acute and chronic wounds, trophic ulcers, bedsores, diabetic foots.

Results: Hydrogels are insoluble, swellable hydrophilic materials from synthetic polymers. Hydrogel dressing has usefull biomedical properties such as: blood compatibility, antioxidant activity, mucoadhesion, antimicrobial activity, oxygen/water vapour permeability, microbial penetration. Hydrogel dressing does not stick to the wound surface. It is easily modeling and can be used on awkward surfaces for applying bandages. Several types of hydrogel bandages armored mesh and saturated different drugs enable surgeons to select the desired content of bandage in a particular case. Addition of bentonite (‘Benta’) and kaolin clay ‘Nanokremnevıt’ has funded new generations of superabsorbent hydrogel nanocomposites for wounds healing. It stimulates healing process, enhances granulation and epithelialization of wounds. Investigation of antiproliferative and antiadhesiogenic properties of hydrogel-impregnated with drug-eluting prosthetic mesh for intraabdominal hernia repair and temporary abdominal wall closure (laparostomy) may be modern approaches to the problem and represents the state of the art.

Conclusion: Creation of modern hydrogel dressing with saturation natural enterosbents such as Bentonite and Nanokremnevıt has potential for clinical application in different directions of surgery including oncology.

Keywords: Wounds healing, Healing clay, Hydrogel dressing.

PP2-100
The Features of Cervical Cancer Course in HIV-Infected Women in Association with HPV
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Oncology and Radiation Diagnostics, Tashkent Medical Academy, Uzbekistan

According to the data MRI and ultrasound studies of the abdomen and pelvis revealed that HIV-infected patients exposed to a more aggressive course of invasive cervical cancer, which is manifested in the iliac lymph node metastasis in combination with spread to pelvic organs (80%). Compared with the HIV-negative patients of metastasis where mainly or only in the iliac/uterine glands. And rarely seen germination in adjacent organs (10%). Cervical cancer is progressing faster and more severe among HIV-infected women compared with HIV-negative (51% against 10% of cervical cancer stage at T4), which proves that the role of the immune status at the severity of the disease. All patients suffering from cancer of the cervix are infected with HPV (100%) Moreover, HIV-infected patients are mainly infected with both HPV types 16 + 18 (80%). While HIV-negative patients suffer only one serotype HPV 16 or 18.

Keywords: Relations of HPV and cervical cancer in HIV infected women, Role of immune status.

PP2-101
Anti-Ovarian Cancer Efficacy Elicited by Umbilical Cord Mesenchymal Stem Cells Infected with Lentivirus-IL-21 in Combination with miR-200c in Nude Mice
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1Obstetrics and Gynecology Department, Southeast University, 2Department of Pathogenic Biology and Immunology, Southeast University, China

Objective: This study was designed to combine gene therapy with cell transplantation therapy, use the lentivirus (LV)-IL-21, and infect the human umbilical cord mesenchymal stem cells (hUCMSCs) to investigate anti-ovarian cancer effects and analyze the possible mechanisms.

Methods: hUCMSCs was cultured and identified by flow cytometry, then hUCMSCs was infected by LV-IL-21. After the activity of IL-21 in hUCMSC was detected the hUCMSCs-LV-IL-21 were used to treat the ovarian cancer bearing nude mice injected with SKOV3 cells. The experiments was divided into seven groups: NS, hUCMSCs, hUCMSCs-LV-Vec, hUCMSCs-LV-IL-21, miR-200c, hUCMSCs-LV-IL-21 combined with miR-200c, and cisplatin groups.

Results: hUCMSCs was cultured successfully, and indicated CD34 (−), CD45 (−), CD29 (+), and CD90 (+). The biological activity of IL-21 in hUCMSCs-LV-IL-21 was confirmed by spleen cell proliferation experiment. The results of animal experiments showed that the inhibition effects on ovarian cancer growth in
nude mice was hUCMSCs-LV-IL-21 combined with miR-200c group > cisplatin group > hUCMSCs-LV-IL-21 group > hUCMSCs group = hUCMSCs-LV-Vec group > control group. After four weeks of treatment, the serum levels of IFN-γ, IL-21 and TNF-α in nude mice were significantly increased in hUCMSCs-LV-IL-21 combined with miR-200c group compared with other six groups, and the killing activity of mouse spleen cells to YAC-1 and SKOV3 was significantly enhanced in hUCMSCs-LV-IL-21 group compared with other groups. Immunohistochemical results showed that the expression of β-catenin, cyclin-D1 and ZEB1 was decreased, accompanied with increase of E-cadherin, in hUCMSCs-LV-IL-21 combined with miR-200c group versus the other groups.

**Conclusions:** hUCMSCs-LV-IL-21 combined with miR-200c increased the secretion of IFN-γ and TNF-α to promote the numbers and activity of NK cells, playing a good role of anti-ovarian cancer in nude mice. The findings provide a new strategy and method for the treatment of ovarian cancer.

**Keywords:** hUCMSCs, Ovarian cancer, IL-21, miR-200c, Targeted therapy.

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**PP2-102**  
**Primary Malignant Melanoma of the Esophagus**

_Hyun Ho Choi, Sung Soo Kim, Jihan Yu, Hyung-Keun Kim, Sang Woo Kim, Hiun-Suk Chae_

Internal Medicine, College of Medicine, The Catholic University, Korea

**Background/Aims:** Primary malignant melanoma of the esophagus is a rare disease and aggressive tumor of the esophagus. Primary malignant melanoma represents 0.1% to 0.2% of all primary esophageal cancers. Hematogenous and lymphatic metastasis are common. The prognosis is quiet poor, so early detection and accurate diagnosis should be made. We encountered a patient with a black esophageal lesion, which was histopathologically confirmed to be primary malignant melanoma of the esophagus.

**Case:** A 65-year-old man was admitted for evaluation of a black pigmentation at lower esophagus which was found at regular general physical exam. He had no symptoms, no history of any illness and no family history of cancer. Physical examination found no abnormal pigmentation of the skin or mucosa. Endoscopy revealed multiple scattered 0.4 cm sized black pigmented ulcerative lesion at 37 cm from the incisors. Pathological findings from endoscopy show tumor cells nodular-growth pattern with dark brown pigmentation. Immunohistochemical staining was positive for HMB45, Ki-67, S100 and melan-A. Computed tomography of chest and abdomen showed no evidence of discernible lesion in the stomach, lung and regional lymphadenopathy. Positron emission tomography demonstrated no regional or distant metastasis. He received esophagectomy and gastroesphagostomy. Muscularis mucosa was involved, but the surgical margin of the esophagus was free from tumors. And all regional lymph nodes were found free of tumor.

**Conclusion:** We report a patient with a black esophageal lesion, which was histopathologically confirmed to be primary malignant melanoma of the esophagus.

**Keywords:** Melanoma, Esophagus, Endoscopy.
resection is defined as histologically positivity of the resected margins, lymphovascular infiltration, piecemeal resection or beyond expanded criteria for ESD.

**Results:** A total 291 patients with more than 6 months follow-up periods were analyzed and the mean (± S.D.) follow up duration was 43.4 (±22.9) months. Of them, 160 patients (55.0%) and 37 patients (12.8%) underwent surgery and endoscopic treatment after non-curative resection, whereas 94 patients (32.3%) were observed. 75 (25.8%) patients had lymphovascular infiltration, 150 (51.5%) patients had EGCs that had margin positive resection, 36 (12.4%) patients had EGCs that had not en bloc resection.

The disease-free survival (DFS) rates was higher in patients with endoscopic treatment than in those with observation group (86.5% and 81.9%, \( p < 0.001 \)). When we compared three subgroups, the 5-year overall survival (OS) was statistically significant in patient with additional surgery group, additional endoscopic treatment group, and observation group (97.5%, 94.6% and 90.8%, respectively, \( p = 0.031 \)).

Among additional endoscopic treatment group, 4 patients (10.8%) developed recurrence of EGC.

**Conclusions:** In this study showed that compared to observation group, additional surgery or endoscopic treatment improved overall survival and disease-free survival in patients with non-curative ESD.

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Table 1. Baseline characteristics of enrolled participants (for Abstract PP2-103)

<table>
<thead>
<tr>
<th></th>
<th>EGC (n = 546)</th>
<th>AGC (n = 193)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD, years</td>
<td>62.6±11.1</td>
<td>63.9±12.6</td>
<td>0.172</td>
</tr>
<tr>
<td>Sex, M:F %</td>
<td>390 (73.9%):138 (26.1%)</td>
<td>154 (73.9%):55 (26.1%)</td>
<td>0.532</td>
</tr>
<tr>
<td>Family history of GC</td>
<td>110 (20.1%)</td>
<td>27 (14.0%)</td>
<td>0.035</td>
</tr>
<tr>
<td>Current or previous H. pylori infection</td>
<td>339 (62.7%)</td>
<td>39 (20.4%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Interval between endoscopic examinations, months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤12</td>
<td>152 (77.2%)</td>
<td>45 (22.8%)</td>
<td></td>
</tr>
<tr>
<td>12–24</td>
<td>126 (77.8%)</td>
<td>36 (22.2%)</td>
<td></td>
</tr>
<tr>
<td>24–36</td>
<td>154 (79.0%)</td>
<td>41 (21.0%)</td>
<td></td>
</tr>
<tr>
<td>36–48</td>
<td>10 (83.3%)</td>
<td>2 (16.7%)</td>
<td></td>
</tr>
<tr>
<td>48–60</td>
<td>11 (73.3%)</td>
<td>4 (26.7%)</td>
<td></td>
</tr>
<tr>
<td>&gt;60</td>
<td>93 (58.9%)</td>
<td>65 (41.1%)</td>
<td></td>
</tr>
<tr>
<td>Histology</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Intestinal type</td>
<td>373 (68.3%)</td>
<td>60 (31.1%)</td>
<td></td>
</tr>
<tr>
<td>Diffuse type</td>
<td>173 (31.7%)</td>
<td>133 (68.9%)</td>
<td></td>
</tr>
<tr>
<td>Treatment modality</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ESD or EMR</td>
<td>215 (51.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td>161 (38.2%)</td>
<td>88 (61.5%)</td>
<td></td>
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<tr>
<td>Palliative chemotherapy</td>
<td>1 (0.2%)</td>
<td>21 (14.7%)</td>
<td></td>
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<tr>
<td>Follow-up loss</td>
<td>44 (10.6%)</td>
<td>34 (23.8%)</td>
<td></td>
</tr>
</tbody>
</table>
| EGC = Early gastric cancer; AGC = advanced gastric cancer; M = male; F = female; H. pylori = Helicobacter pylori; GC = gastric cancer; ESD = endoscopic submucosal dissection; EMR = endoscopic mucosal resection.

Table 2. Association between early gastric cancers and the interval between endoscopic examinations (for Abstract PP2-103)

<table>
<thead>
<tr>
<th>Interval between endoscopic examinations, months</th>
<th>OR 95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;24</td>
<td>1.318 0.907–1.914</td>
<td>0.148</td>
</tr>
<tr>
<td>&lt;36</td>
<td>1.874 1.250–2.808</td>
<td>0.002</td>
</tr>
</tbody>
</table>

OR = Odds ratio; CI = confidence interval.
Possible confounding variables (family history of GC, H. pylori status and histology of GC) at diagnosis were adjusted in this analysis.

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Simple and Safe Forcep Strip Technique for Gastric Submucosal Tumors Originating from Muscularis Propria Layer

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**Background and Aims:** Resection of submucosal tumors by means of endoscopy has been reported using a variety of techniques. However, lesions originating from the muscularis propria layer are unlikely to be resected completely and safely. Here, we...
report the first series describing the new technique of endoscopic resection for submucosal tumors of the stomach using the simple and safe forcep strip technique.

**Methods:** Endoscopic submucosal tumor resection using hot biopsy forcep was attempted in ten consecutive patients in clinical indications for lesion removal. Following injection around the submucosal tumor, the adjacent mucosa or submucosa was grasped with the forceps and pulled away forming a ‘tent’. Electrocoagulating current was applied for dissection of tissue. For repeating described process, the tumor was dissected from the muscularis propria layer and then carefully removed using forcep.

**Results:** All of the ten patients that underwent Forcep Strip Technique for the gastric submucosal tumors were successful, with the complete resection rate of 100%. There was no major bleeding and the procedure time was reduced compared to the conventional methods. No complications occurred and follow-up was unremarkable. It is possible to resect submucosal tumor any part of the stomach (fundus, cardia, body). On histology, all tumors were resected completely (eight gastrointestinal stromal tumor, two leiomyomas).

**Conclusions:** Forcep Strip Method appears to be an easy, safe, and effective procedure for treatment of gastric submucosal tumor originating from the muscularis propria layer. **Keywords:** Gastric submucosal tumor, Muscularis propria, Forcep.

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**PP2-106**

**Comparison of the Characteristics of Synchronous and Metachronous Gastric Tumor after Endoscopic Resection**

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**Background:** Endoscopic submucosal dissection (ESD) and endoscopic mucosal resection (EMR) have become a standard treatment for in a certain early gastric cancer (EGC). However, metachronous or synchronous tumor after endoscopic resection is observed and become a main problem in follow up. We aimed to compare the characteristics of synchronous and metachronous tumor in patient with EGC or adenoma with high grade dysplasia after endoscopic resection.

**Methods:** A total of 552 patients who underwent endoscopic resection (ESD or EMR) between January 2002 and February 2016 in Seoul Paik Hospital were reviewed retrospectively. We analyzed the characteristic of synchronous or metachronous tumors after endoscopic resection with endoscopic findings, pathologic findings and EGC types.

**Results:** In total, 33 (5.9%) patients had synchronous tumors, and 30 (5.4%) patients had metachronous tumors. Male and older (> 65 years old) patients had more common in synchronous and metachronous group (69.8%, 73.0%). The median period until discovery of metachronous tumor after initial ESD was 28.8 months. Helicobacter pylori infection rate was only 12.7% in both groups. Severe mucosal atrophy (grade 2–3) had more frequent in metachronous group (90%, P = 0.01). Marginal involvement of primary tumor was more frequent in synchronous group (57.6% vs. 26.7%, P = 0.01). Histological type (EGC type) was similar distribution on both groups. Intestinal metaplasia and location of tumor was not showed difference between two groups.

**Conclusion:** Synchronous and metachronous tumor after endoscopic resection of EGC and gastric adenoma is observed in 11.3%. We recommend careful follow up in old male patients with severe mucosal atrophy or margin involvement. Physicians should observe the stomach not only previous resection site but also whole stomach during follow-up EGD. **Keywords:** Gastric submucosal tumor, Muscularis propria, Forcep.

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**PP2-107**

**The Effectiveness and Long-Term Outcomes of Carcinomatosis and Ascites Status of Palliative Treatment in the Patients of Advanced Gastric Cancer with Bowel Obstruction**

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**Background/Aims:** Advanced gastric cancer (AGC) patients with colorectal obstruction usually underwent palliative therapy by using self-expandable metal stent (SEMS) placement or surgery. However, the clinical efficacy and impact of carcinomatosis and ascites status have not been evaluated in patients with colorectal obstruction by AGC according to treatment modalities.

**Method:** We retrospectively evaluated 232 patients with colorectal obstruction in AGC that were diagnosed between 2006 and 2014. The study population was analyzed by the patency and overall survival between SEMS placement versus surgery according to carcinomatosis and ascites status.

**Result:** The median age of the study population (126 men, 106 women) was 55 years (SD 12.8). During the follow-up period (mean 24 months, SD 32), 185 (79.7%) patients deployed SEMS and 47 (20.3%) patients received palliative colorectal surgery. The clinical success (57.3% vs. 78.7%, P = 0.007,) and technical success rate (74.1% vs. 93.6%, P = 0.004,) were higher in the palliative surgery group than the SEMS placement group. The patency of palliative surgery group was longer than the SEMS placement group (P < 0.001 by log-rank test). In subgroup analysis, the patients with good performance who had carcinomatosis with ascites, the patency duration was longer in the surgery group than in the SEMS placement group (P = 0.005). In patients who had neither carcinomatosis nor ascites, patency duration was longer in the surgery group than in the SEMS placement group (P = 0.041). In a subgroup of patients who had carcinomatosis without ascites, patency duration was not significantly different between surgery groups and the SEMS placement groups (P = 0.153). The overall survival rates were not significantly different between surgery and the SEMS placement groups according to carcinomatosis with ascites status.
Conclusion: The efficacy of palliative treatment modality for bowel obstruction caused by AGC was affected by carcinomatosis and ascites status.

Keywords: Advanced gastric cancer, Colorectal obstruction, stent placement, Palliative surgery, Carcinomatosis, Ascites.

PP2-108
Study on Incidence of Helicobacter Pylori in Patients of Gastroduodenal Perforation Admitted in Tertiary Care Center – Hamidia Hospital Bhopal

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Background/Aim: Acid-reduction surgery has been strongly advocated in past for perforated peptic ulcers because of the high incidence of ulcer relapse after simple closure. Since Most patients with Gastroduodenal perforation are associated with Helicobacter pylori (H. pylori) infection, Simple oversewing procedures either by an open or laparoscopic approach together with H. pylori eradication appear to supersede definitive ulcer surgery.

Method: Total number of 70 patients were included in this prospective study with diagnosis of perforation peritonitis admitted in emergency ward. These patients were operated in emergency by simple closure of perforation with omental patch repair. Peroperative biopsy sample was taken from margin of perforation and sent for staining by H & E and Giemsa staining for H pylori. After 15 days endoscopic biopsy was taken from gastric antrum for H pylori staining. Anti H pylori Eradication Therapy (Triple therapy—1 PPI + 2 antibiotic) for 14 days was given to the positive cases.

Result: Out of 70 consecutive patients (mean age = 47 years, range 15–75) of perforation H pylori was seen in 48 patients (68.57%). Total 28 patients (40%) were having h/o use of NSAIDS in recent past. Male to female ratio was 3:1 and most common age group was 46–55 years. In the H pylori positive patients, Anti H pylori eradication therapy was given. These all patients were in follow up for 1 year and are asymptomatic.

Conclusion: H pylori is strongly associated with Gastroduodenal perforation, (48/70) 68.57% were positive for H pylori. Gastric perforation was more common than duodenal perforation and prepyloric region was commonest site. For H pylori detection, biopsy and staining is a good method. Early Anti H pylori therapy for patients of Gastroduodenal perforation who were positive for H pylori, provide an excellent cure after simple closure of perforation.

Keywords: H. pylori, Gastroduodenal perforation, Peptic ulcers.

PP2-109
Chemotherapy for Patients with Initially Unresectable Gastric Cancer, Focusing on Conversion Gastrectomy

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Aims: This study was conducted to evaluated the effectiveness of biweekly docetaxel/S-1 treatment (DS) in facilitating conversion gastrectomy and improving long-term survival and to elucidate the predictive factors for conversion of tumors from unresectable to resectable in this patient population.

Methods: A total of 78 advanced gastric cancer patients diagnosed as initially unresectable (with bulky N2/3, T4b (SI), H1. P1 and/or M1) receiving biweekly docetaxel/S-1 treatment (DS) were including this study between July 2007 and August 2010. To identify the impact of DS, univariate and multivariate analyses were performed.

Results: The median survival time was 15.5 months. Thirteen of 78 patients (16.7%) underwent gastrectomy. Univariate and multivariate analyses revealed that the gastrectomy after DS treatment, Eastern Cooperative Oncology Group performance status and Glasgow prognostic score (GPS) significantly affected prognosis. The 1-year and 2-year cumulative overall survival (OS) rate of conversion surgery group vs. non-surgery group are 56.0% (p = 0.001), and 63.5% vs. 11.9% (p<0.001), respectively.

Multivariate analysis revealed that cStageIII was significant predictive factor for conversion gastrectomy after DS therapy (OR 3.717; p = 0.022).

Conclusions: DS may facilitate conversion gastrectomy and allow for favorable outcomes in selected patients with initially unresectable gastric cancer.

Keywords: Unresectable, Gastric cancer, Conversion gastrectomy.
PP2-110
Gastrectomy for Gastric Cancer with Synchronous Multiple Primary Cancers
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Background/Aims: Advances in the surgical treatment and perioperative management for various cancers changes the strategy for the patients with multiple primary cancers. Recently, concomitant resection of multiple primary cancers were often conducted. However, surgical outcomes and the usefulness of concomitant resection were not established. The aim of this study is to evaluate the surgical outcomes for the patients of gastric cancer with multiple primary cancers.

Method: A total of 259 patients who underwent radical operation for gastric cancer were retrospectively analyzed. Surgical outcomes of gastric cancer patients with other synchronous cancers (Multiple cancer group: MC group) and those without other cancers (GC group) were compared.

Result: MC group contained 49 (18.9%) patients. The average age was 69.7 years in MC group and 67.4 years in GC group. Triple cancers were observed in 8 patients and double cancers were 41. There were 15 esophageal cancer patients (5.8%), 10 hepatocellular carcinomas (3.9%), 9 oral, pharynx, or larynx cancers (3.5%), 8 lung cancers (3.1%), 6 colon cancers (2.3%), 4 prostate cancers (1.5%), 1 bladder, uterus, breast, ovary, skin, suprarenal gland, and pancreatic cancer in each (0.4%). Multiple organs treatment with gastrectomy was performed in 32 cases. The complication rate more than Clavien-Dindo classification III was 28.1% and 10.4%, respectively. The mean observational period was 4.7 years. The mean number of harvested lymph nodes were 48.3 ± 12.3.

Conclusion: This study suggests that gastrectomy with other organ treatment could be safely performed in gastric cancer patients with multiple primary cancers. In addition, it might also have survival benefit as well as gastrectomy in patients without multiple primary cancers.

Keywords: Multiple primary cancers, Gastric cancer, Gastrectomy.

PP2-111
Reduced Port Laparoscopic Distal Gastrectomy for Gastric Cancer by Using Only an Electrothermal Bipolar Vessel Sealing Device: Result of a Pilot Study from a Single Institute
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Background/Aims: LVSS (LigasureTM vessel sealing system) is a commercially developed electrothermal bipolar vessel sealing device, and supplies a strong vessel-sealing power. However, there was still few report of laparoscopic surgery for gastric cancer by using only LVSS. The purpose of this study is to investigate the feasibility of solo reduced port laparoscopic distal gastrectomy for gastric cancer by using only LVSS.

Method: From April 2014 to December 2014, patients in whom reduced (single or three) port laparoscopic distal gastrectomy had been engaged for early gastric cancer enrolled in this study. We performed D1+ lymph node dissection by using only LigaSureTM Maryland (Medtronics, Minneapolis, U.S.A.), a recently issued instrument for LVSS. In addition, Unitrack (Aesculap, Tuttingen, Germany) was used for holding the scope in every case. Clinical outcomes were investigated in these patients.

Result: 14 patients enrolled in this study. The mean total operation time was 253.3 ± 22.2 minutes. The mean time for lymph node dissection was 162.5 ± 15.6 minutes. Only one patient underwent the morbidity of Clavien-Dindo grade more than II. There was no mortality in all the patients. Mean number of harvested lymph nodes were 48.3 ± 12.3.

Conclusion: Reduced (single or three) port laparoscopic distal gastrectomy for gastric cancer by using only LVSS was feasible. Moreover, LVSS has a benefit for time-saving in solo laparoscopic distal gastrectomy.

Keywords: Ligasure, Reduced port, Laparoscopic surgery, Gastric cancer.

PP2-112
Effects of Laparoscopic Approach on the Timing of Adjuvant Chemotherapy Administration for Patients with Gastric Cancer
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Background: Laparoscopic gastrectomy has become one of standard surgical procedures and this approach offers several important benefits including accelerated recovery, earlier return to bowel function, reduced postoperative pain, and early discharge from hospital which can lead to earlier administration of adjuvant chemotherapy.

Methods: Between January 2008 and December 2012, histologically confirmed stage II and III gastric cancer patients who un-
nderwent gastrectomy and received adjuvant chemotherapy in Seoul National University Bundang Hospital were enrolled. In a total of 403 patients, 245 patients underwent laparoscopic gastrectomy and 158 patients underwent open gastrectomy. The primary endpoint was the timing of adjuvant chemotherapy administration and the secondary endpoint was DFS rates. DFS were estimated by the Kaplan-Meier method.

Results: The patients who received adjuvant chemotherapy in 4 weeks were 15, 380 patients in 4–8 weeks and 8 patients after 8 weeks. In univariate analysis of factors effecting late timing of adjuvant chemotherapy, there were significantly different in surgical extent (TG vs. STG), complications and surgical approach (open vs. laparoscopy). But in multivariate analysis, there was significantly difference in only complications. In prognostic factors for DFS, there were significantly difference in TNM stage and timing of adjuvant chemotherapy.

Conclusions: The patients who underwent laparoscopic gastrectomy were received adjuvant chemotherapy earlier comparing open gastrectomy because of lower complication rates.

PP2-113
Vessel Navigation Using Indocyanine Green Fluorescence during Robotic and Laparoscopic Gastrectomy
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Purpose: Nevertheless preservation of infrapyloric artery (IPA) is a key step for the successful pylorus-preserving gastrectomy, it remains challenging to identify the type of IPA intraoperatorically. Indocyanine green (ICG) fluorescence technique is known to visualize the blood vessel and flow during reconstruction, thus we speculated that this emerging technique would be helpful for identifying the type of IPA.

Methods: From August 2015 to February 2016, 18 patients who undergoing robotic or laparoscopic gastrectomy were prospectively enrolled to this study. After the ligation of right gastroepiploic vein, about 3 ml of ICG (2.5 mg/ml) was injected intravenously and near-infrared fluorescence apparatus was applied. The identified shape of IPA was classified into distal, caudal and proximal type, and it was confirmed by the real anatomy after infrapyloric dissection.

Results: Twelve robotic and six laparoscopic gastrectomies were performed. The mean interval time between ICG injection and visualization of the artery was 22.4 seconds (range 14–30), and the mean duration of arterial phase was 15.7 seconds (range 9–30). The overall accuracy of ICG fluorescence for identifying IPA type was 77.8% (14/18). Four cases were failed to predicting actual IPA type, which all occurred in obese patients with BMI of more than 23 kg/m².

Conclusion: Our preliminary results indicate that intraoperative vascular imaging using ICG fluorescence technique would be helpful for robotic or laparoscopic pylorus-preserving gastrectomy.

Keywords: Gastric cancer, Laparoscopic surgery, Indocyanine green, Fluorescence.

PP2-114
Indication and Efficacy of Single Port Staging Laparoscopy for Peritoneal Dissemination of Gastric Cancer
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Background: Peritoneal dissemination (PD) in gastric cancer (GC) is critical factor determining the prognosis. Despite developments of imaging, it remains difficult to detect PD exactly. Staging laparoscopy (SL) is effective modality to detect unsuspected PD, leading to avoiding unnecessary laparotomy. The aim of this study is to confirm the indication for SL and evaluate the efficacy of single port SL.

Methods: i) Indication for SL: We retrospectively identified the factors associated with PD from 293 resected specimens with serosal invasion and developed scoring system for PD. We evaluated the predictive power of scoring system for PD in 78 GC patients without clinically suspected PD underwent SL. ii) efficacy of single port SL: We used the SILS® port for 43 patients and the multichannel port (X-Gate®) for 17 patients. We evaluated and compared the safety and efficacy between SILS® and X-gate®.

Results: i) We identified 4 factors (tumor size, Type 3 or 4, undifferentiated type and LN metastasis) associate with PD and demonstrated the efficacy of predictive power of scoring system. The cut off value was determined by ROC (AUC: 0.72). The detection rate of PD was 39.7% (31/78) and sensitivity, specificity, positive or negative predictive value and accuracy were 90.3%, 53.2%, 56%, 89.3% and 64.1%, respectively. ii) The average of operative time were 67.1 min (SILS) and 69.4 min (X-Gate) respectively. In the SILS vs. X-gate, 20 vs. 3 patients diagnosed as P0CY0 at SL underwent laparotomy after the SL. Of these patients, PD was found at the laparotomy in 1 patients in SILS group (false-negative rate 2.9%).

Conclusion: We confirmed the predictive factors associated with PD and demonstrated the efficacy of predictive power of scoring system, which is useful for detecting previously unsuspected PD. And SL by single port is safe and useful for accurate diagnosis, leading to avoid unnessesary laparotomy.

Keywords: Staging laparoscopy.
PP2-115
Long-Term Oncologic Outcomes of Laparoscopic Gastrectomy for Advanced Gastric Cancer
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Background: We conducted a prospective phase II clinical trial to evaluate the feasibility of laparoscopic gastrectomy (LG) with D2 lymph node dissection (LND) in advanced gastric cancer (AGC).

Methods: The primary endpoint was 3-year disease-free survival (DFS). The eligibility criteria were as follows: 20–80 years of age, cT2N0-cT4aN2, American Society of Anesthesiologists score of 3 or less, and no other malignancy. A total of 204 patients were enrolled to this single-arm study between Nov 2008 and May 2012. 47 were excluded because of far advanced stages in laparoscopic exploration or early gastric cancer. All patients underwent D2 lymphadenectomy. Three year DFS rates were estimated by the Kaplan-Meier method.

Results: The overall short-term complications rates were 11.5%. One patient died from operation-related complications. Conversion to open surgery occurred in 11 patients (7.0%). The mean follow-up was 48 months (1–81 months). Recurrence was observed in 39 patients (24.8%), including hematogenous (n = 6), peritoneal (n = 18), locoregional (n = 1), distant node (n = 6) and mixed recurrence (n = 8). The cumulative 3-year DFS rates were 73.9% for all stages, 100% for stage I, 93.2% for stage II, 89.6% for stage IIIA, 73.9% for stage IIIB, and 36.1% for stage IIIC.

Conclusions: In addition to being safe and technically feasible for the treatment of AGC, with acceptable rate of morbidity and mortality, LG with D2 LND for locally AGC showed acceptable 3-year DFS outcomes. ClinicalTrial.gov Registration: NCT01441336.

Disclosure of Conflict of Interest (COI): NO.

PP2-116
Clinical Outcome and Clinicopathological Characteristics for Remnant Gastric Cancer
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Background: Remnant gastric cancer after gastrectomy has been reported to be rare, so clinicopathological characteristics and the optimal surgical strategy has not been well known. The purpose of this study was to evaluate the clinical and surgical impact of remnant gastric cancers.

Patient and Methods: Between January 2000 and September 2015, 34 patients with remnant gastric cancer underwent gastrectomy. We investigated clinicopathological features, lymphatic flow and the clinical outcome.

Results: The number of initial surgery for benign was 14 and for malignancy was 20. The mean intervals between the initial gastrectomy for benign and diagnosis of remnant gastric cancer was 39 years, and for malignancy was 12.4 years. Location of remnant cancer was mainly anastomotic line and non-stump area. 16 cases were at anastomotic line and 12 cases were at non-stump area. In 34 patients, 25 cases achieved Ro resection and 9 cases were R1. Almost all R1 cases were positive of cytology. Metastasis in the regional lymph nodes were observed in 14 cases. Remnant gastric cancer initially resected for gastric cancer had few LN metastases and that case, station of LN metastasis were at the splenic hilum. Lymph node involvement in the jejunal mesentery was observed for the remnant gastric cancer after Billroth II reconstruction. All that cases, cancer location was anastomotic line and especially invaded to the jejunum site. Prognosis of stage I and II patients were relatively good, but Stage III and IV were poor prognosis and no one gained 3-year survival.

Conclusion: Remnant gastric cancer located on anastomotic line, especially invaded to the jejunum site, have to take the jejunum mesenteric lymphadenectomy.

Keywords: Remnant gastric cancer, LN flow.

PP2-117
Nutritional Status in Elderly Patients after Gastrectomy for Stomach Cancer Comparing that in Young Patients: Six-Months Results of Prospective Cohort Study
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Purpose: The aims of this study were to evaluate postoperative nutritional status in elderly patients (≥70 years old) at postoperative 1 month, 3 month and 6 month and to compare that with the younger patients’ nutritional status.

Method and Patients: From May 2014 to Aug 2015, 54 elderly patients (E-group) and 69 younger patients (Y-group) applied Mini-Nutrition Assessment Short form (MNA-SF). We collected data on demographics, surgical and pathologic characteristics, body weight, hemoglobin (Hb), total lymphocyte count (TLC), serum albumin, cholesterol, prealbumin, and ferritin at each period.

Results: E-group had similar demographic, surgical and pathological characteristics with Y group except that E-group had more comorbidity, laparoscopic gastrectomies and lesser postoperative chemotherapy. Their weights decreased at postoperative 1 month and lasted after that. Their MNA-SF scores decreased at postoperative 1 month and recovered between postoperative 3 and 6 month. Their level of Hb and prealbumin decreased at postoperative 1 month and recovered at postoperative 3 month. Preoperatively, E-group had similar weight and MNA-SF score with Y-group, but had lower levels of Hb, TLC, serum albumin, cholesterol, and prealbumin than Y-group. Their level of Hb became similar at postoperative 3 month. Their levels of albumin and cholesterol became similar at postoperative 6 month. Their Their MNA-SF scores became worse than Y-group’ scores at postoperative 1 month and became similar at postoperative 3 month.
Conclusion: Six months after gastrectomy, most elderly patients who were assessed as malnourished by MNA-SF at postoperative 1 month had returned to their preoperative status, although their weight, BMI, and cholesterol were not recovered. So we need more attention to the elderly patients’ nutritional status at short-term period after gastrectomy.

Keywords: Nutritional status, Elderly, Gastrectomy, Gastric cancer.

PP2-118
Long-Term Results of Definitive Concurrent Chemoradiotherapy in Esophageal Squamous Cell Carcinoma
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Background and Aims: Definitive chemoradiation is one of the treatment modalities for esophageal cancer, especially for cervical cancer. However, long-term effectiveness of chemoradiation for esophageal cancer, regardless of cancer location is not well understood. The aim of this study is to analyze the long-term survival of combined chemoradiation as a definitive treatment of cervical or thoracic esophageal cancers.

Patients and Methods: We retrospectively reviewed consecutive patients who received high-dose external beam radiotherapy and concurrent cisplatin-based chemotherapy for known esophageal cancers between January 2011 and January 2016.

Results: Definitive chemoradiation (median dose 60 Gy, range 50–70Gy) was performed in 102 patients (median age 68 years, range 45–82 years, IQR 60–74 years) with esophageal cancers (stage I: 18; stage II: 30; stage III: 30; stage IVa: 9; stage IVb: 14 patients). Esophageal stricture was detected in 21 (20%) patients. The location of cancer (cervical or upper thoracic vs. others, OR 5.476; 95% CI 1.508–19.885; P = 0.010) and length of cancer (>5 cm vs. ≤5 cm, OR 1.17; 95% CI 1.022–4.003; P = 0.043) were statistically associated with subsequent esophageal stricture after definitive chemoradiation.

Conclusions: The incidence of esophageal stricture after definitive chemoradiation was high. The location and length of cancer have influence on the occurrence of esophageal stricture after definitive chemoradiation.

Keywords: Esophageal cancer, Definitive chemoradiation, Esophageal stricture, Location, Length.

PP2-120
Preoperative Smoking Cessation Less than 90 Days Increases Postoperative Morbidity after Esophagectomy for Esophageal Cancer
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Background: Smoking is one of the risk factors for postoperative morbidity. There were no studies on the correlation between the duration of smoking cessation and the incidence of morbidities after esophagectomy.

Methods: A total of 287 patients undergoing elective esophagectomy with 2 or 3-field lymphadenectomy for esophageal cancer between April 2005 and March 2016 were retrospectively analyzed. Patients were divided into five groups according to the duration of smoking cessation: 0–29 days, 30–59 days, 60–89 days, 90–119 days, and ≥120 days.

Results: The incidence of postoperative complications was significantly higher in patients who quit smoking for less than 90 days (P < 0.01). The risk of postoperative morbidity was highest in patients who quit smoking for less than 90 days (OR 1.92, 95% CI 1.04–3.57; P = 0.037).

Conclusions: Preoperative smoking cessation less than 90 days increases postoperative morbidity after esophagectomy. Smoking cessation less than 90 days needs to be avoided for patients undergoing esophagectomy.
smoking cessation (no smoking cessation (including cessation for a few days), cessation for 7 to 30 days, 31 to 90 days, ≥91 days, never smoker).

Results: Any morbidity of Clavien-Dindo classification (CDc) ≥II, pneumonia, any pulmonary morbidity, surgical site infection, cardiovascular morbidity, and severe morbidities of CDc ≥IIIb frequently occurred in patients with no smoking cessation. The incidence of pneumonia and severe morbidities decreased as the duration of smoking cessation became longer. Logistic regression analysis suggested that no smoking cessation was the independent risk factor for any pulmonary morbidity (HR 2.26, 95% CI 1.061–4.682; p = 0.035). Smoking cessation ≤30 days was also the independent risk factor for severe morbidities of CDc ≥IIIb (HR3.07, 95% CI 1.448–6.742; p = 0.003).

Conclusions: Preoperative smoking cessation more than 90 days are ideal to reduce morbidities after esophagectomy. When patients with insufficient smoking cessation undergo esophagectomy, careful perioperative management is required.

Keywords: Esophagectomy, Morbidity, Smoking cessation.

PP2-121

Body Mass Index May Predict the Long-Term Outcomes of Advanced Gastric Cancer

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Background/Aims: Radical gastrectomy followed by adjuvant chemotherapy for advanced gastric cancer causes serious nutritional impairment. Our study evaluated the clinical impact of body mass index (BMI) on the long-term outcomes of advanced gastric cancer (Stage II and III).

Method: We analyzed 211 cases of Stage II and III gastric cancer between January 2005 and December 2010 at Chung-Ang University Hospital. Patients were divided into 4 groups according to BMI: underweight, normal, overweight, and obese. In addition, we divided patients into two groups: BMI-High (BMI ≥23) versus BMI-Low (BMI <23). We assessed age, sex, tumor location, lymph node involvement, operation method, initial cancer stage, recurrence, and survival between the two groups.

Result: There was significant difference in overall survival between the underweight group and the other groups (P = 0.005). The survival of the BMI-H group was better than that of the BMI-L group. The rate of cancer-related death in the BMI-H group was significantly lower than that in the BMI-L group (cancer-related death: BMI-L 27% vs. BMI-H 12.6%, P = 0.022).

Conclusion: Our findings suggest that preoperative BMI may have an influence on the long-term outcomes of advanced gastric cancer after radical surgery and chemotherapy.

Keywords: Body mass index, Gastrectomy, Gastric cancer, Outcome.

PP2-122

E-PASS Scoring System to Estimate Short-Term Outcome after Esophagectomy in Patients with Esophageal Cancer

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Background/Aims: Postoperative morbidity after esophagectomy for esophageal cancer is still frequent. Tools for prediction of postoperative complication have been sought, with the Estimation of Physiologic Ability and Surgical Stress (E-PASS) scoring system being one of the candidates. The aim of this study was to determine the usefulness of the E-PASS system for risk assessment of esophagectomy.

Method: The clinical courses of 494 patients who underwent elective subtotal esophagectomy with lymph node dissection for esophageal cancer were analyzed. The incidence and severity of complication and influence of preoperative therapy were investigated using the E-PASS scoring system.

Results: The incidence of any complication was as high as 42.5%. The frequency of severe and critical complications was 12.1% and 6.9%, respectively. The E-PASS system could estimate the incidence and severity of complication. Patients with a comprehensive risk score (CRS) >0.9 had a significantly higher probability of incidence of severe or critical complication. The incidence of complication and the CRS increased linearly according to preoperative treatment and these were significantly higher after salvage esophagectomy.

Conclusion: The E-PASS scoring system was useful for risk assessment after esophagectomy. Patients undergoing salvage esophagectomy and patients with a CRS >0.9 should be treated carefully after surgery.

Keywords: Esophageal cancer E-PASS.
PP2-123
Quality of Life Outcomes after Endoscopic and Surgical Treatment of Early Gastric Cancer: A Prospective Cohort Study

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Objectives: To evaluate changes in the quality of life (QOL) of patients with early gastric cancer (EGC) after treatment, and compare changes in the QOL by the treatment procedures (endoscopic resection [ER] vs. surgery).

Methods: We reviewed the baseline characteristics and questionnaire results of patients who had undergone ER or surgery for EGC that were prospectively collected by the Korean Gastric Cancer Cohort study. To measure QOL, the validated Korean version of the European Organization for Research and Treatment of Cancer 30-item core QOL questionnaire (EORTC-QLQ-C30) and its gastric module (STO22) were used. We compared the QOL outcomes at pretreatment, and 1 year and 2 years after ER and surgery.

Results: In this study, 2,283 patients were included; 542 and 1,741 patients underwent ER and gastrectomy, respectively. Patients in the ER group were more likely to report a better QOL, except for the global QOL, after treatment than those in the surgery group. All the symptom domains were better in the ER group in terms of the absolute score and symptomatic percentage. In the surgery group, role functioning, diarrhea, dysphagia, eating restriction, anxiety, and body image scores deteriorated at 1 year and recovered at 2 years, except diarrhea did not recover to the baseline level. In the surgery group, the percentage of symptoms such as diarrhea, dysphagia, eating restriction, body image, and pain (gastric module) increased at 1 year and decreased at 2 years postoperatively, but not to the baseline level. Although the global QOL significantly improved postoperatively, patients who underwent ER had slight improvement at 1 year but deterioration at 2 years.

Conclusions: ER for EGC results in a better QOL than surgery, specifically in terms of symptom-related QOL, not the global QOL.

Keywords: Quality of life, Early gastric cancer, Endoscopic resection, Gastrectomy.

PP2-124
Estimated Glemerular Filtration Rate is Useful for Risk Stratification of Postoperative Complications in Patients with T2-4 Gastric Cancer

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Background/Aim: D2 gastrectomy is a mainstay of treatment options in patients with resectable gastric cancer and is a complex procedure associated with relatively high morbidity. Identifying predictive factors for surgical morbidity enables to provide patients appropriate informed consent and perioperative management. We aimed to evaluate the predictive value of preoperative estimated glomerular filtration rate (eGFR) for postoperative morbidity among patients who underwent curative gastrectomy for T2-4 gastric cancer.

Methods: This study included 310 patients with resectable T2-4 gastric cancer. The predictive values of clinical parameters including preoperative eGFR for postoperative morbidity (grade III and IV in the Clavien-Dindo classification) were evaluated. Subgroup analyses were conducted according to age, body mass index, types of gastrectomy and disease stage.

Results: The median preoperative eGFR was 72.9 ml/min/1.73 m². The area under the curve for predicting complications was greater for eGFR compared with the serum creatinine level or estimated creatinine clearance. The optimal cutoff value of eGFR was 64.6 ml/min/1.73 m². Patients with low preoperative eGFR had a significantly higher morbidity rate and prolonged postoperative hospital stay. Multivariate analysis identified low preoperative eGFR as an independent risk factor of postoperative morbidity (odds ratio 3.33, 95% CI 1.54–7.39, P = 0.002). When subdivided patients by age, body mass index, types of gastrectomy and disease stage, the morbidity rate was higher in patients with low preoperative eGFR.

Conclusions: Our results indicated that preoperative eGFR served as a useful predictor of postoperative morbidity in patients with T2-4 gastric cancer.

Keywords: Estimated glomerular filtration rate.
PP2-125
The Effectiveness of Irreversible Electroporation According to Tissue Properties of Upper Gastrointestinal Tract
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Introduction: Irreversible electroporation (IRE) is a promising novel technique for the ablation of tumors. IRE has an advantage over other ablation technique in its mechanism to remove undesired cells by affecting the cell membrane without thermally destructing blood vessels, nerves and the surrounding tissues. But there was no study about treatment effect of IRE according to tissue properties in upper gastrointestinal tract. Our purpose was to study effectiveness of IRE according to tissue properties in rat upper gastrointestinal tract.

Aims and Methods: The Sprague-Dawley rats were used throughout this study. IRE ablation was applied in upper stomach and esophagus (squamous cell epithelium) and lower stomach (columnar cell epithelium) with same energy parameters. The energy delivered for each ablation was 50/100 pulses of 1 KV/cm ~ 3 KV/cm. All samples for histologic analysis and tunnel assay were got at 0 hrs, 10 hrs, 24 hrs and 48 hrs after IRE. And we used DNA microarrays to measure the expression levels of large numbers of genes in rat stomach according to different electrical energy. And we measured several apoptotic gene expression using real time RT-PCR.

Results: All animals survived for their designated times. H-E staining showed extensive cell death area, which were proved by a pyknotic nucleus and eosinophilic cytoplasm near absence of cell at 10 hours after IRE ablation in upper and lower gastric tissue. The number of significantly up-regulated apoptotic genes was higher in 2 KV, 100 pulse and 10 hr than that of other electrical energy groups. The significantly up-regulated genes related to apoptosis after IRE ablation in all IRE setting were s100a8/9, Ccl2, Timp1, Aif1, Lcn2, hspb1 genes, but caspase-related genes were down-regulated in 2 KV, 100 pulse and 10 hr than that of other electrical energy groups. The number of significantly up-regulated apoptotic genes was higher at 10 hours after IRE ablation in upper and lower gastric tissue. The pyknotic nucleus and eosinophilic cytoplasm near absence of cell staining showed extensive cell death area, which were proved by a tunnel assay.

Conclusion: This study showed that IRE ablated upper gastrointestinal tissue through cellular apoptosis. And the degree of apoptosis after IRE ablation was tissue and electric energy specific in gastrointestinal tract.

Keywords: Barrett’s esophagus, Esophageal neoplasm, Irreversible electroporation, Stomach neoplasm.

PP2-126
Comparison of Pre-Operative Peritoneal Wash and Drainage versus Urgent Laparotomy Strategy in Patients with Late Stage Secondary Perforation Peritonitis. A Randomized Controlled Trial
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Objective: Peritonitis is inflammation of peritoneum which is most commonly due to generalized or localized infection. Secondary peritonitis is the commonest form and a large percent of them is due to perforation or impending gastrointestinal perforation. The prognosis of which depends on multiple factors by which Mannheim Peritonitis Index (MPI) appears to be more practical.

Aim of the Study: To assess the value of pre-operative aspiration of peritoneal fluid followed by peritoneal wash and drainage before proceeding to definitive surgery in patients with MPI score >20.

Material and Methods: A prospective study. Each patient admitted to the emergency department in these hospitals with perforation peritonitis was evaluated with MPI score. If the score was less than 20; the patient managed with resuscitation and broad spectrum antibiotics for 2–3 hours then definitive surgery while those with MPI more than 20 were randomly divided into two groups; the first were managed with 2–3 hours resuscitation with intra-venous fluid resuscitation and antibiotics followed by urgent surgical exploration (USE). The second group were managed with percutaneous peritoneal drainage (PPD) with aspiration of the fluid and then irrigation of the peritoneal cavity with isotonic saline and followed by a drainage with aid of the gravity through another catheter located in the right iliac fossa.

Results: Sixty two patients entered the study. The most common cause of their high MPI score is the late presentation and the evidence of organ failure. Renal failure is the most prevalent organ failed in both groups. The most common underlying causes were perforated peptic ulcer. There is a decrease in overall mortality in group (PPD). Those with (USE) showed no improvements in the pre-operative vital signs, prolonged operation time and a higher mortality and more severe post-operative complication than PPD group.

Conclusion: The pre-operative percutaneous peritoneal aspiration of the fluid followed by peritoneal irrigation and drainage in patients with advanced stage of perforation peritonitis is associated with a significant improvement in the pre-operative pulse rate and blood pressure, decrease in the operation time, a decrease in the overall mortality and deep seated wound infection and dehiscence but it is associated with a higher mortality in the first post-operative day.

Keywords: Peritonitis, Mannheim peritonitis index (MPI), Urgent surgical exploration (USE), Percutaneous peritoneal Drainage (PPD), Organ failure, Mortality.
PP2-127
Postoperative Neutrophil-to-Lymphocyte Ratio as an Independent Predictor of Survival in Patients with Gastric Adenocarcinoma

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Background and Aim: A high preoperative neutrophil-to-lymphocyte ratio (NLR) has been reported to be a prognostic factor for patients with gastric cancer after treatment. However, the clinical implication of postoperative NLR change remains unclear. Most studies focused on the pretreatment values of inflammatory markers. We aim to investigate the prognostic role of postoperative NLR in patients with gastric adenocarcinoma.

Methods: 616 patients diagnosed as gastric adenocarcinoma between 2003 and 2014 from two institutions were included. The following clinicopathologic variables were recorded: patient age; AJCC stage; tumor location; tumor size; histological grade; lymphatic, vascular, and perineural invasion; adjuvant chemotherapy; margin involvement. All preoperative white cells and differential counts were taken within 3 days before surgical procedure, and postoperative NLR was obtained at 6 months follow-up visit. Baseline characteristics, overall survival (OS) and disease-free survival (DFS) were compared according to preoperative NLR and/or postoperative NLR change.

Results: Compared with preoperative NLR, postoperative NLR decreased in 402 patients and increased in 214 patients after surgical treatment. Receiver operating characteristic (ROC) curve exhibited good discriminatory power considering the overall survival for postoperative NLR than preoperative NLR (area under the ROC = 0.707). Comparing to preoperative NLR, increased postoperative NLR was significantly associated with poor OS and DFS (p < 0.001). The survival of patients with lower or higher preoperative NLR can be distinguished more accurately by postoperative NLR change. Multivariate analysis showed that postoperative increased NLR change was an independent prognostic factor for both OS (p < 0.001, HR = 2.552, 95% CI 1.744–3.734) and DFS (p < 0.001, HR = 2.442, 95% CI 1.609–3.707).

Conclusions: There was a significant correlation between increased NLR change, and worse relapse-free and overall survival, especially in patients with gastric adenocarcinoma. After operation, increased NLR change was an independent prognostic factor for gastric adenocarcinoma undergoing surgical procedure, comparing with decreased NLR change.

Keywords: Gastric adenocarcinoma, Neutrophil-to-lymphocyte ratio.

PP2-128
Post Gastrectomy Internal Hernia in Patients with Gastric Cancer

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Background: Internal hernia has been a critical complication after gastrectomy in patients with gastric cancer. However, the incidence of internal hernia is not well described. The purpose of this study was to analyze the incidence, characteristics of internal hernia and management after gastrectomy.

Methods: A total of 1,219 gastric cancer patients who underwent gastrectomy with various surgical methods were reviewed at Seoul National University Bundang Hospital from January 2013 to December 2014.

Results: 900 patients had potential space for internal hernia after gastric cancer surgery. 13 patients underwent surgical treatment of internal hernia after gastrectomy for gastric cancer. They included 2 women and 11 men, aged 37–80 years (median 58 years). The median interval between preceding gastrectomy and surgery for internal hernia was 436 days. The mean body mass index (BMI) at time of surgery for the hernia was 20.84 Kg/m2, and the mean BMI reduction ratio was 11.6%. The hernia was classified as a jejunojejunoscopy with a mesenteric defect in 7 patients, Petersen’s space in 6 patients.

Conclusion: Internal hernia after gastrectomy is likely underreported. A high degree of suspicion of internal hernia should be given to patients with nausea, vomiting and abdominal pain after gastrectomy. Closure of mesenteric defects after open or laparoscopic gastrectomy should be considered as a standard method to reduce internal hernia.

Keywords: Gastric cancer, Internal hernia, Gastrectomy.

PP2-129
LincRNA HOTAIR Determines Chemosensitivity for 5-FU and Cisplatin in Gastric Cancer Cell Lines

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Background/Aims: In gastric cancer, 5-FU and cisplatin are mostly used for chemotherapy of advanced gastric cancer, however, their effectiveness is limited by drug resistance. Emerging evidences suggest that the long intergenic noncoding RNA (lincRNA) HOTAIR contributes to carcinogenesis and progression of gastric cancer. This finding suggests that HOTAIR might have correlation with anticancer drug resistance. In this study, we investigated the relationship between lincRNA HOTAIR expression level and the drug resistance after 5-FU and cisplatin treatment in gastric cancer cell lines.

Abstracts
PP2-130
Genes Associated with Prognosis of Hepatocellular Carcinoma: Validation of Microarray Results Using Quantitative Real Time RT-PCR

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Introduction: In the previous array-based analysis of gene expression and DNA methylation associated with recurrence of HCC, up- and down-regulating genes affecting on the HCC recurrence were extracted, that was reported already by our cooperative group.

Method: In this study, we validated the down-expressed and hyper-methylated genes (MRPL4, PCDHB11, SN2, CYGB, HS-D17B6) and an overexpressed and hypo-methylated gene (NMB) in independent cohort (n = 90) using HCC tissues and paired normal liver tissues collected from multicenter in Korea. We measured gene expression of the six genes using real time RT-PCR from the normal and HCC tissues, analyzed correlation of prognosis and gene expression between tumor and non-tumor.

Result: Out of six genes, CYGB and PCDHB11 were little expressed in both tumor and non-tumor, which is not consistent with our previous result. In apart, GPSN2 and MRPL4 were over expressed in tumor tissues in comparison to normal.(p < 0.0001) However NMB was overexpressed in tumor tissue than in non-tumor tissue.(p = 0.0002) as same as the previous result.

PP2-131
CDK9 Is a Prognostic Marker and Therapeutic Target in Pancreatic Cancer

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Background/Aim: Despite recent advances in diagnosis and therapy, prognosis of pancreatic cancer remains very poor. Consequently, novel therapeutic approaches are urgently needed. The family of cyclin-dependent kinases (CDKs) comprises 20 kinases which contribute to malignancy by promoting proliferation, migration, invasion, and apoptosis resistance of cancer cells. In this work we investigated the role of CDK9 in pancreatic cancer. Furthermore the therapeutic potential of selective CDK9-inhibition was evaluated in pancreatic cancer cells.

Material and Methods: Tumor and normal tissue of pancreatic cancer patients was immunohistochemically analyzed for CDK9 expression and correlated with patients’ survival. Moreover, the therapeutic potential of a selective CDK9-inhibitor on pancreatic cancer cells was evaluated by analysis of cell viability, long-term survival and apoptosis and characterized using western blotting and flow cytometry.

Results: CDK9 is overexpressed in pancreatic cancer tissue. In addition, high CDK9 expression in tumor tissue is associated with significantly shortened survival, especially in highly differentiated tumors. Pharmacological CDK9-inhibition drastically reduced...
cell viability in pancreatic cancer cells and potently suppressed long-term survival. Analyzing the molecular mechanism revealed that CDK9-inhibition induced apoptosis and cell cycle arrest in a time-dependent manner. Moreover, CDK9-inhibition is capable of intensifying the therapeutic effect of chemotherapeutics and apoptotic-inducing agents in pancreatic cancer cells.

**Conclusion:** CDK9 is a negative prognostic marker in pancreatic cancer. Furthermore, pharmacological CDK9-inhibition is a novel and promising therapeutic approach for pancreatic cancer.

**Keywords:** Pancreatic cancer, CDK9, Kinase-inhibitor, Prognostic marker, Anti-cancer therapy.

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**PP3-001**

**Surgery in Overweight Patients with Insulinoma: Effects on Weight Loss and Metabolic Control**

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**Background:** Only several case reports have demonstrated complete resection of insulinoma contributes to weight loss. The aim of this study was to explore the weight loss and metabolic changes in overweight insulinoma patients after surgery.

**Methods:** A retrospective study was conducted to review the follow-up data of weight changes in insulinoma patients (BMI ≥ 25 Kg/m²) who underwent complete lesion resection between September 2010 and May 2015. The outcomes included weight changes, body mass index (BMI), percentage excess weight loss (%EWL) and remission situation of metabolic comorbidities, respectively at three months, 1 year, 3 years after surgery.

**Results:** Of the 42 patients, 61.9% were women. All patients had no hypoglycemic symptoms after surgery. Mean BMI at baseline was 29.2 ± 3.3 Kg/m² (mean±SD), significantly more than BMI at 3 months postoperatively, 25.2 ± 2.5 (P < 0.01) and 1 year postoperatively, 25.0 ± 2.8 (P < 0.01). Sixteen patients had complete data during 3-year follow-up. BMI of sixteen patients at 3 years postoperatively was 25.2 ± 1.8 Kg/m² (mean±SD), significantly more than 1 year postoperatively (p = 0.04) but lower than baselines (P < 0.01). Mean %EWL in low BMI group (BMI < 27.5) was 90.4%, significantly more than 62.4% in high BMI group (BMI ≥ 27.5), at 1 year after surgery. 7 out of 11 patients with hypertension had normal blood pressure within 1 year after surgery. All patients with obstructive sleep apnea syndrome had improved sleep quality and 50% didn’t use positive airway pressure machines.

**Conclusions:** Mean BMI decreased during the 3 months postoperatively and remained significantly lower than basal values throughout follow-up in spite of slightly increase at 3 years after surgery. Patients in low BMI group are more likely to reach ideal weight. Most patients with OSAS or hypertension received remission.

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**PP3-002**

**The Efficacy of Differential Diagnosis between Neoplastic and Non-Neoplastic Gallbladder Polyps on Color-Flow Doppler Endoscopic Ultrasonography**

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**Background/Aim:** Endoscopic ultrasonography (EUS) is useful imaging modality for identifying gallbladder (GB) polyps, however, the differential diagnosis between non-neoplastic polyps and neoplastic polyps of the gallbladder is limited. We evaluated the usefulness of color-flow doppler EUS (CFD-EUS) for differentiating neoplastic GB polyps from non-neoplastic polyps.

**Method:** Between August 2014 and February 2016, a total of 172 patients with GB polyps who underwent CFD-EUS were consecutively enrolled in this prospective study.

**Result:** Of the 172 patients, 83 patients underwent surgical resection. Of these, there were 66 (79.5%) cases of non-neoplastic GB polyps and 17 cases (20.5%) of neoplastic GB polyps. The remaining 2 patients were not diagnosed with GB polyps (submucosal hyalinization and gastric heterotopia). The overall diagnostic accuracy of EUS for neoplastic polyps was 75.9%. In a multivariate analysis, color-flow imaging (CFI) was the significant predictive factor for neoplastic polyps (odds ratio [OR] 8.65, 95% CI, 1.48–50.44, P = 0.017); the sensitivity, specificity, positive predictive value, and negative predictive value were 88.2%, 40.9%, 27.8%, and 93.1%, respectively. In addition, solitary polyp had an increased risk of neoplasm (OR 10.02, 95% CI, 2.28–43.96, P = 0.002), as did those with polyps ≥ 15 mm (OR 6.60, 95% CI, 1.52–28.62, P = 0.012).

**Conclusion:** The presence of CFI, solitary, polyps with diameters ≥ 15 mm on EUS could be predictive factor for neoplastic GB polyps. In view of no danger to the patient and no requirement for additional equipment, we regard that CFD-EUS is likely to become supplemental tool for differential diagnosis of GB polyps (CRIS: KCT0001373).

**Keywords:** Endoscopic ultrasonography, color-flow doppler, Gallbladder polyp.
PP3-003
Outcomes of Surgical Management for Pancreatic Neuroendocrine Tumors (PNETs): A Single-Center Experience
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Background: The optimal management for patients with pancreatic neuroendocrine tumors (PNETs) is surgical resection. While the indication for small PNETs (≤2 cm) and the appropriate operation method remains controversial. We summarized our PNETs cases in recent years to assess the outcomes of surgical management for PNETs.

Methods: From March 2003 to December 2015, a total of 71 consecutive patients with PNETs underwent surgery were selected. Data were identified from a prospectively maintained database. Postoperative and survival outcomes were retrospectively analyzed. We also compared different operation method (tumor enucleation and standard resection) to evaluate feasibility and the difference in postoperative complications. 5-year survival rate was investigated between patients with PNETs ≤2 cm and >2 cm.

Results: There were 28 patients (38.4%) who exhibited clinical symptoms. Enucleation was performed in 16 patients (22.5%), pancreatoduodenectomy in 17 (23.9%), distal pancreatectomy in 22 (31%) and partial pancreatectomy in 11 (15.5%). Overall morbidity was 28.2% (20/71), while the most common complications were pancreatic fistula (6/71, 8.5%) and anastomotic bleeding (7/71, 9.9%). Based on our data, enucleation was regarded as a relatively safe procedure dealing with small tumor located at the surface layer away from the pancreatic duct. The rate of pancreatic fistula between the enucleation group (6.25%) and standard resection group (10.0%) was comparable (P = 0.548). About 40.8% patients (29/71) had a small PNET (≤2 cm), and these patients had an overall survival advantage over patients with PNETs >2 cm (5-year survival rate: 94.1% vs. 81.2%, P = 0.048).

Conclusions: Based on tumor size and location, enucleation may be a safe procedure during resection of small PNET away from the pancreatic duct. Patients with PNETs ≤2 cm have a survival benefit to those with PNETs >2 cm. However, a longer follow-up in a well-designed randomized controlled trial is necessary to more thoroughly evaluate.

Keywords: Pancreas, Neuroendocrine tumor, Survival.

PP3-004
Outcome Analysis Based on the Revised Histological Classification by the World Health Organization (2010) for Pancreatic Neuroendocrine Tumors
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Background and Aim: Pancreatic neuroendocrine tumors (PNETs) are a rare subgroup of tumors, for which the factors predictive of survival and prognosis are not well known. Recently, the European Neuroendocrine Tumors Society (ENETS) proposed the TNM staging and the World Health Organization (WHO) revised its histological classification in 2010. This study aimed to evaluate whether the ENETS staging and the revised WHO classification can predict survival after surgical resection of PNETs.

Methods: Twenty-seven consecutive curative resections for PNETs were performed at Hirosaki University Hospital from 1998 to 2015. The treatment outcomes and prognostic factors for survival based on the revised WHO histological classification (2010) were evaluated retrospectively.

Results: The median patient age was 61 (33–84) years. The median tumor diameter was 17 (8–140) mm. According to the ENETS staging, 18 (66.7%), 3 (25.0%), 4 (14.8%), and 2 (7.4%) had stage I, II, III, and IV tumors, respectively. According to the revised WHO histological classification (2010), 20 (74.1%), 5 (18.5%), 1 (3.7%), and 1 (3.7%) patient was diagnosed with neuroendocrine tumor (NET) G1, NET G2, neuroendocrine carcinoma (NEC), and mixed adeno-neuroendocrine carcinoma (MANEC), respectively. All patients with NET G1 were still alive without recurrence, while all with NEC and MANEC were dead. Five (18.5%) patients had the lymph node involvement and all of them had the tumor >20 mm in diameter. Recurrence occurred in 4 patients (14.8%) with NETG2 and more. Univariate analysis revealed that both the ENETS staging and the revised WHO histological classification (2010) significantly predicted survival after surgical resection for PNETs.

Conclusions: Some PNETs >20 mm in diameter are likely to have the lymph node involvement, therefore, radical surgery with lymphadenectomy is strongly recommended. The ENETS staging and the revised WHO histological classification (2010) may be useful to predict survival in PNETs.

Keywords: Pancreatic neuroendocrine tumor, ENETS staging, WHO histological classification 2010, Prognosis.
Multiple endocrine neoplasia type 1 (MEN1) is a rare hereditary syndrome known to predispose subjects to endocrine neoplasms in a variety of tissues such as the parathyroid glands, pituitary gland, pancreas and gastrointestinal tract. We herein report a patient with MEN1 presenting with recurrent jejunal perforation. A 32-year-old female patient presented to our hospital with the complaint of whole abdominal pain. Physical examination present whole abdominal tenderness and rebound tenderness and computed tomography showed free air and jejunal first portion perforation. Laparoscopic primary closure and omentopexy was done. One year later, she readmitted with same symptom and CT scan shows free air and proximal jejunum was suspected as perforated site. Laparoscopy showed jejunal perforation of previously perforated site and primary closure was performed. To differentiate the cause of recurrent jejunal perforation, abdominal MRI was performed. Three well-enhancing pancreatic nodules (1 cm in head, 2.3, and 2.1 cm in tail area) were found in MRI. Technetium (99 mTc) sestamibi scan showed active uptake in both lower parathyroid glands. In neck sonography, two extrathyroidal (1.5 cm in left and 2.1 cm in right side) nodules were found in inferior portions. Serum prolactin concentration was also elevated (489.26 ng/ml, reference range 3–35 ng/ml) and 1.6 cm sized pituitary adenoma was found in sella MRI. Enucleation of pancreatic neuroendocrine tumors was performed. Insulin was expressed in both head and tail tumors and gastrin was expressed in tail in immunohistochemistry. Total parathyroidectomy with autotransplantation was done for hyperparathyroidism. Genetic testing was done to evaluate MEN1 gene mutation and 1546dupC mutation in exon 10 was found in this patient and her daughter. The results observed in our patient suggest that perforation might be symptoms of Zollinger-Ellison Syndrome in patients with MEN1.

Keywords: Multiple endocrine neoplasia: Zollinger-ellison, Pancrea, Parathyroid, Pituitary.

Aims: Concomitant vascular injury with post cholecystectomy bile duct injury is possible. It is considered as an increasing finding during repair. Thus, assessment of those injuries is crucial for defining the optimal surgical management.

Methods: One hundred and sixty patients were managed for post cholecystectomy bile duct injury between January 2010 to December 2015. Patients records were revised including preoperative, intraoperative and postoperative data. Follow up visits were also revised. Vascular injury was identified intra-operatively at the beginning of the study while, later, all patients were carried out Computed Topographic hepatic angiography.

Results: Thirty five patients had concomitant vascular injury. Majority were females (75%) with mean age 35 years (range, 30–50 years). Most of the injuries were post open cholecystectomy (71%). All the patients had right hepatic artery injury while seven had added right portal vein injury. Sixteen patients had right hepatectomy and left hepatico-jejunostomy (46%). Three patients died (9%) due to sepsis and multi-organ failure. The remaining patients had conventional hepatico-jejunostomy.

Conclusions: Assessment of vascular injury is an important part in the management of patients with bile duct injuries. Isolated arterial or combined portal injuries may lead to hepatectomy while mortality occurred due to cholangitic abscesses, severe cholangitis with subsequent sepsis.

Keywords: Right hepatic artery, Iatrogenic injury, Post-cholecystectomy complications.

Background: Gallbladder cancer (GBCA) is a rare malignancy with vague symptoms. GBCA is sometimes diagnosed after urgent cholecystectomy for acute cholecystitis. We investigated the differential diagnosis point of GBCA from acute cholecystitis.

Methods: Thirteen patients were diagnosed with GBCA after urgent cholecystectomy for acute cholecystitis. A radiologist who performed the emergency cholecystectomy diagnosed GBCA in all cases. Physical examination and laboratory test were carried out in all patients. Initial diagnosis was made based on clinical and radiological findings. Ultrasound and CT scan were performed in all patients. Histological and immunohistochemical examination were carried out in all cases.

Results: Gallbladder cancer was diagnosed in 13 patients. CT scan and ultrasound showed wall thickening, mural nodules, and pericholecystic fluid collection. Histological examination of the resection specimen confirmed the diagnosis of gallbladder cancer. Immunohistochemical examination showed positive staining for cytokeratin and negative staining for bcl2 in all cases.

Conclusions: Emergency cholecystectomy is the initial treatment option in acute cholecystitis. However, post-operative diagnosis of gallbladder cancer may be delayed due to vague symptoms and complications. Therefore, radiological and histological examination is essential for early diagnosis of gallbladder cancer.
did not know patient diagnosis reviewed computed tomography (CT) scans of the patients with GBCA and 25 patients with acute cholecystitis. We compared clinical characteristics and CT findings. We also investigated prognostic factors.

**Results:** GB stones were more often found in patients with acute cholecystitis ($n = 17, 68\%$) than patients with GBCA ($n = 7, 53.8\%$) ($p = 0.486$). Some patients with GBCA showed typical GB masses or focal enhanced wall thickening. However, some GBCA patients showed irregular mural thickening and GB enhancement. Differentiating carcinoma from acute cholecystitis might not be possible. Those patients had lower C-reactive protein (CRP) levels ($p = 0.033$) and less regional fat stranding ($p = 0.047$). Survival was affected by aggressive tumor characteristics rather than bile spillage.

**Conclusion:** When the surgeon must decide to perform emergency cholecystectomy in elderly patients with acute cholecystitis, surgeon must suspect GBCA in patients that showed irregular mural thickening and enhancement of GB without regional fat stranding and low CRP level.

**Keywords:** Acute cholecystitis, Gallbladder cancer, Irregular mural thickening.

**PP3-008**
*Clinicopathological Features of Cystic Duct Carcinoma: CDC could be Sub-Type of Gallbladder Carcinoma or Not?*

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**Background:** Cystic duct cancer (CDC) is a rare tumor, and CDC sometimes spreads in a complicated manner due to its anatomical features. Therefore, it has remained unclear whether CDC could be subtype of Gallbladder carcinoma or not. The purpose of this study was to evaluate the clinicopathological features of CDC and compare them to those of perihilar cholangiocarcinoma (PHC), distal cholangiocarcinoma DCC, and Gallbladder carcinoma that required extrahepatic bile duct resection (GBC).

**Patients and Methods:** The diagnosis of CDC was defined based on our diagnostic criteria. There were 45 cases with CDC, 193 cases with PC, 111 cases with DC, and 46 cases with GC from January 2000 to December 2014.

**Results:** The need for preoperative biliary drainage was similar in CDC patients and PC and DC patients. There were no significant differences between CDC patients and other patients in the preoperative platelet count, serum albumin level, serum CEA level, and serum CRP level. Major hepatectomy was performed for $47\%$ of CDC patients. Operation time and operative bleeding of CDC patients were similar to those of PC/GC patients. The postoperative complication rate was $62\%$ in CDC patients, higher than in PC/GC patients. The mortality rate was $6.7\%$, similar to that of PC/GC patients. There were no significant differences in the pathological lymph node metastasis rate between CDC patients and the others. The incidence of perineural invasion of CDC patients was similar to that of PC/DC patients. The incidence of portal vein invasion of CDC patients was similar to that of PC/GC patients. The 5-year overall survival rate and the 5-year disease-specific survival rate were $20.5\%$ and $28.4\%$, respectively, lower than for other patients.

**Conclusion:** Because CDC shows similar clinicopathological features, but its prognosis would be worse than that of PC/DC/GC.

**Keywords:** Cystic duct carcinoma, Clinicopathological feature, Cholangiocarcinoma.

**PP3-009**
*Gemcitabine Plus Cisplatin Chemotherapy in Advanced Biliary Tract Cancer: A Single Center Analysis*

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**Background:** A combination chemotherapy of gemcitabine and cisplatin is one of the recommended treatment options for patients with advanced biliary tract cancer (BTC) based on the ABC-02 trial since 2010. The aim of this study was to assess the efficacy and safety of this regimen.

**Methods:** Patients with advanced BTC who were treated with gemcitabine plus cisplatin as an initial chemotherapy between January 2010 and March 2016 at Yeungnam University Hospital were reviewed retrospectively. Treatment consisted of cisplatin $30 \text{mg/m}^2$ and gemcitabine $1000 \text{mg/m}^2$ on days 1, followed by gemcitabine $1000 \text{mg/m}^2$ on days 8, repeated every 3 weeks. Tumor response was evaluated using the Response Evaluation Criteria in Solid Tumors (RECIST) version 1.1 every 2–3 cycles. Toxicity was assessed by the Common Terminology Criteria for Adverse Events (CTCAE) version 3.0.

**Results:** A total $34$ patients with advanced BTC ($15$ intrahepatic cholangiocarcinoma, $12$ gallbladder cancer and $7$ extrahepatic cholangiocarcinoma) were enrolled. There were $22$ men and $12$ women with a median age of $61.7$ years (range: $45–76$). The median number of administered cycles was $5$ (range: $2–14$). After $2–3$ cycles of chemotherapy, $3$ patients ($8.8\%$) had partial response, $19$ patients ($55.9\%$) had stable disease and $9$ patients ($26.5\%$) had progressive disease. The response rate (CR+PR) was $8.8\%$ and tumor control rate (CR+PR+SD) was $64.7\%$. The median time to progression (TTP) and median overall survival (OS) of $34$ patients were $4.9$ months and $6.9$ months, respectively. TTP and OS were significantly longer in tumor control group than tumor progressive group ($6.2 \text{vs. } 2.3 \text{months}$ and $8.2 \text{vs. } 4.6 \text{months}$, respectively). Adverse events included anemia ($14$ patients, $41.2\%$), neutropenia ($13$ patients, $38.2\%$), thrombocytopenia ($11$ patients, $32.3\%$), anorexia ($3$ patients, $8.8\%$) and peripheral neuropathy ($1$ patient, $2.9\%$).

**Conclusion:** Gemcitabine plus cisplatin seems to be an effective first-line chemotherapy regimen with manageable toxicity in patients with advanced BTC.

**Keywords:** Advanced biliary tract cancer, Chemotherapy.
PP3-010
Diagnostic Efficacy of EUS-FNA in Patients with Suspected Bile Duct Malignancy
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Background/Aims: There are only few reports that described the efficacy of endoscopic ultrasound (EUS) guided fine needle aspiration (FNA) for biliary tract malignancy. The aim of this study is to investigate the efficacy of EUS-FNA on diagnostic yield for bile duct malignancy which includes wall thickening of biliary tract and mass forming lesions.

Method: In this retrospective study, patients who underwent EUS-FNA due to suspected biliary tract malignancy in a tertiary medical center were included. Clinically suspected pancreatic cancer, gallbladder cancer, ampulla of vater cancer or other malignancy which involved biliary tract were excluded.

Result: Total of 127 patients underwent EUS-FNA due to suspected biliary malignancy from January 2011 to January 2016 at a single tertiary medical center. Among them, 28 (22.0%) lesions were hilar level bile duct and 99 (78.0%) lesions were common bile duct. 75 (59.1%) lesions showed mass forming feature and 52 (40.9%) lesions showed wall thickening feature in imaging modalities. Sensitivity and accuracy of EUS-FNA in total of 127 patients were 50.9% and 58.3%, respectively. However, the sensitivity and accuracy in mass forming lesions were 62.3% and 65.3%, respectively and those in lesions with wall thickening were 30.8% and 48.1%, respectively. Among the 60 patients who performed both EUS-FNA and ERCP biopsy, 25 (41.7%) patients had wall thickening lesions. The sensitivity and accuracy of ERCP biopsy in those patients were 52.9% and 68.0%, respectively and when ERCP biopsy was combined with EUS-FNA, the sensitivity and accuracy were improved to 70.6% and 80.0%, respectively.

Conclusion: EUS-FNA is a promising diagnostic modality for bile duct malignancy. Especially in bile duct lesions showing wall thickening without definite mass formation, additional EUS-FNA can improve the diagnostic yield of ERCP biopsy.

Keywords: Bile duct, Endoscopic ultrasound, Fine needle aspiration.

PP3-011
Pancreatoduodenectomy versus Ampullectomy for T1 Ampullary Cancer: Clinicopathological Analysis Based on Treatment Outcome
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Background and Aim: Pancreatoduodenectomy (PD) has been established as the standard surgical procedure for ampullary cancer. Alternatively, ampullectomy has also been performed for benign tumors and early cancers (T1) in the ampulla of Vater. However, this procedure has not yet been established as a treatment option. The aim of this study was to evaluate the prognostic factors for recurrence and survival after curative resection for ampullary cancer and to investigate whether ampullectomy can substitute for PD in T1 ampullary cancer.

Methods: Seventy-three consecutive patients with ampullary cancer underwent initial curative resection (66 PD, 7 ampullectomy) at our institute between 1983 and 2015. The clinicopathologic factors for recurrence and survival were evaluated retrospectively by univariate and multivariate analyses.

Results: Recurrence was confirmed in 30 patients (41.1%), and the most frequent site of recurrence was the distant organs (n = 22), such as the liver or lungs. In univariate analysis, the presence of obstructive jaundice, high level of CA19-9, moderate or poor differentiation, lymph node involvement, lymphovascular invasion, and perineural invasion were significant factors for both recurrence and survival. In multivariate analysis, high CA19-9 and PT2-4 were independent factors for recurrence, and high CA19-9 was the only independent factor for survival. In multivariate logistic regression analysis, high CA19-9 and gross morphology, except for the exposed protruded type, predicted lymph node involvement. Of the 25 patients with T1, three (12%) had lymph node involvement. Six (66.7%) of the seven patients who underwent ampullectomy had recurrence.

Conclusion: High level of CA19-9 was the most important predictor for lymph node involvement and recurrence, especially distant metastasis, after radical surgery for ampullary cancer. Thus, more effective systemic adjuvant therapy for oncological control in patients with high CA19-9 is necessary in order to improve future outcomes. We suggest that PD is the optimal surgical procedure at present, even for T1 cancer. Furthermore, ampullectomy should not be chosen easily due to the possibility of lymph node involvement and high rate of recurrence.

Keywords: Ampullary cancer, T1 cancer, Ampullectomy, Pancreatoduodenectomy.

PP3-012
Clinicopathological Features of Cystic Duct Cancer
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Introductions: Cystic duct cancer (CDC) is classified as gallbladder cancer (GBC) according to the Japanese classification system. On the other hand, CDC is considered to be histologically similar to bile duct cancer (BDC) because both the cystic duct and the bile duct lack the muscularis propria layer. Much of the clinicopathological features of cystic duct cancer remain unknown.

Patients and Methods: We investigated the clinicopathological features of 11 patients with CDC who underwent surgical resection at Hirosaki University Hospital, and compared them with 54 patients of GBC and 179 patients of BDC.

Abstracts

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Abstracts

PP3-013

Extrahepatic Bile Duct Combined with Hepatic S1458 Resection for Hilar Cholangiocarcinoma

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Objective: To investigate the value of clinical application of the extrahepatic bile duct combined with hepatic S1458 resection for radical resection at the same time to save the liver parenchyma to prevent the postoperative hepatic insufficiency for hilar cholangiocarcinoma in Bismuth type III AND IV.

Methods: The clinical data of two patients with hilar cholangiocarcinoma in Bismuth type III and IV were analyzed. All the two patients were admitted to hospital on account of the obstructive jaundice. The liver CT scan showed that tumor lesion at the hepatic hilum. The patients underwent radical resection of hilar cholangiocarcinoma + hepatic S1458 resection + Roux-en-Y hepaticojunostomy in the left lateral segmental and the right posterior segmental ducts. The first patient underwent the right hepatic artery resection due to the tumor invaded this artery. The follow-up was performed by outpatient examination and telephone interview up to June 2016.

Results: The two patients received successful radical resection. The result of pathological examination showed that moderately differentiated adenocarcinoma infiltrated though bile duct into liver tissues. All of lymph nodes in the 5th, 8th, 12th and 13th group were negative by detection. The resection margins of liver, vascular and bile ducts were negative, achieving a R0 resection. The two patients were discharged from hospital at postoperative day 17 and 12, respectively. For the patients, there were a good life expectancy and treating patients with gallbladder hydrops and/or acalculous cholecystitis. It might be reasonable to classify CDC as GBC according to its clinicopathological features.

Conclusions: It is important to consider CDC when diagnosing and treating patients with gallbladder hydrops and/or acalculous cholecystitis. It might be reasonable to classify CDC as GBC according to its clinicopathological features.

Keywords: Cystic duct cancer, Clinicopathological features.

PP3-014

Analysis of the Results of Laparoscopic Cholecystectomy in Destructive Forms of Acute Calculous Cholecystitis

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Purpose: Conduct analysis of laparoscopic results in destructive forms of acute calculous cholecystitis.

Materials and Methods: From 2010–2015 in the department of general surgery of the Central Hospital of the Ministry of Internal Affairs were treated 206 patients with destructive forms of acute calculous cholecystitis. The age of patients ranged from 23–75 years, men were 110 (53%), women – 96 (47%). From the beginning of disease to treatment in hospital within 24 hours were hospitalized 55 (26.7%), within 48–72 hours 151 (73.3%) patients. Within days after admission to the hospital were operated 31 (15%), after 1 day of receipt – 62 (32%), for 2–3 days – 113 (55%). On admission, all patients were examined, an abdominal ultrasound was performed, and if necessary was performed MSCT and MRI cholangiography.

Results: Laparoscopy was performed to all 206 patients; for 193 (93%) patients the operation was completed with laparoscopic cholecystectomy, for 13 (6.3%) patients were carry out conversion. In this case the cause of the transition to the conversion were – bleeding from the gall bladder bed in 2 patients, in 2 – Mirrizi syndrome, 9 – pronounced inflammatory and infiltrative process in bile areas. Interoperative phlegmonous form of acute calculous cholecystitis was detected in 123 (59%) patients, gangrenous form in 83 (41%). Complications arising after laparoscopic cholecystectomy in destructive forms of acute calculous cholecystitis were: lymphocele in the right subhepatic area in 2 cases, biloma of subhepatic area due to choledochal duct injury in coagulation – 1, clipping and the intersection of choledochal duct – 1. In three cases, the patients were re-operated by laparoscopic debridement and drainage of right subhepatic area.

Conclusion: Thus, in 93.6% cases it was possible to finish the operation laparoscopically in patients with destructive forms of acute calculous cholecystitis. In 6.3%, the conversion is made, and the reason for the conversion.

Conclusions: It is important to consider CDC when diagnosing and treating patients with gallbladder hydrops and/or acalculous cholecystitis. It might be reasonable to classify CDC as GBC according to its clinicopathological features.

Keywords: Hilar cholangiocarcinoma, Hepatic S1458 resection, Postoperative hepatic insufficiency, Radical resection.

PP3-014

Analysis of the Results of Laparoscopic Cholecystectomy in Destructive Forms of Acute Calculous Cholecystitis

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Conclusion: Thus, in 93.6% cases it was possible to finish the operation laparoscopically in patients with destructive forms of acute calculous cholecystitis. In 6.3%, the conversion is made, and the reason for the conversion.

Conclusion: The extrahepatic bile duct combined with hepatic S1458 resection was safe for the hilar cholangiocarcinoma in Bismuth type III and IV without the hepatic hilum vessels trunk and bifurcation invaded. Compared with the major hepatic resection and extended hepatectomy, this surgical method could maximally retained the remaining functional liver volume, which could effectively reduce the incidence of the postoperative complications, such as hepatic insufficiency.

Keywords: Hilar cholangiocarcinoma, Hepatic S1458 resection, Postoperative hepatic insufficiency, Radical resection.
PP3-015
Propensity Score-Matched Analysis of Robotic versus Open Surgical Enucleation for Small Pancreatic Neuroendocrine Tumours
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Background: Enucleation of pancreatic neuroendocrine tumours (pNETs) via robotic surgery has rarely been described. This study sought to assess the safety and efficiency of robotic surgery for the enucleation of small pNETs.

Methods: A comparison was conducted of enucleation of pNETs smaller than 2 cm by robotic or open surgery between January 2000 and May 2015. Propensity score matching was used to balance sex, age, body mass index, tumour location and tumour diameter. Pathological results, safety-related outcomes (postoperative pancreatic fistula (POPF) rate, estimated blood loss, and short-term mortality and morbidity) and efficiency-related outcomes (duration of surgery and postoperative length of hospital stay) were compared between the groups.

Results: A cohort of 120 patients with pNET were enrolled in the study (1:1 matched for open or robotic surgery, 60 per group). Ninety-three patients (77.5 per cent) had a grade 1 tumour and 114 (95.0 per cent) had an insulinoma. Robotic surgery had a conversion rate of 5 per cent (3 of 60), and was not associated with an increased POPF rate (10 per cent versus 17 per cent after open surgery; P = 0.283) or grade III-V surgical complications according to the Dindo-Clavien classification (3 versus 10 per cent respectively; P = 0.272). Estimated blood loss was reduced with the robotic approach (32.5 versus 80 ml in the open group; P = 0.008), as was duration of surgery (117 versus 150 min; P < 0.001). Length of hospital stay was similar in the two groups (12.0 versus 13.5 days respectively; P = 0.071).

Conclusion: Robotic surgery for enucleation of pNETs smaller than 2 cm did not increase POPF or major complication rates, and reduced the duration of surgery and estimated blood loss, compared with open surgery. Registration number: NCT02125929 (https://www.clinicaltrials.gov/).

PP3-016
Laparoscopic Total Pancreatectomy in Benign and Borderline Malignant Tumor of the Pancreas: Perioperative Outcomes and Quality of Life
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Background: Laparoscopic pancreas surgery has been practiced with development of the surgical technique and the laparoscopic instrument. Also total pancreatectoduodenectomy has been applied for benign and borderline pancreatic disease.

Materials and Methods: From 2005 to 2015, 12 consecutive patients underwent laparoscopic total pancreatectomy (Lap TP) and 32 patients underwent open total pancreatectoduodenectomy (Open TP) in Yonsei University severance Hospital. Among them we were select the patient who diagnosed benign and borderline pancreatic tumor.

Results: Seven patients were female and 3 were male with age, 68.8 ± 8.8 year-old. Spleen could be preserved in 4 patients by use of segmental resection of both whole splenic vessels. Operation time (R2 = 0.316, p = 0.408) and estimated blood loss (R2 = 0.045, p = 0.583) were not statistically different during case experiences, however, length of hospital stay became short with statistical significance as case experiences were accumulated (R2 = 0.671, p < 0.0001). There were no statistical difference in intraoperative blood loss between two groups (512.5 ± 267.7 vs. 550.0 ± 276.1 ml, p = 1.000). Perioperative outcome: patients’ age was older in laparoscopic group (68.8 ± 8.8 vs. 68.8 ± 8.8 years, p = 0.013), but there were no significant differences in other perioperative conditions. However, estimated intraoperative blood loss (255.7 ± 85.2 vs. 1485.7 ± 1121.3, p = 0.05) was small and length of hospital stay (15.4 ± 4.7 vs. 25.3 ± 12.4 days, p = 0.072) was shown to be short in laparoscopic group with marginal significance.

Conclusion: Lap TP is feasible and safe in selected patients. And Lap TP procedure could be applied to benign and borderline malignant pancreatic disease including metastatic cancer to pancreas.

Keywords: Laparoscopic, Open, Total pancreatectoduodenectomy, Benign to borderline malignancy.

PP3-017
Laparoscopic Cystogastrostomy ‘Posterior Approach’ for Management of Pseudo Pancreatic Cyst: Our Initial Experience
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Background: Pancreatic pseudocyst (P.P) is a complication of acute or chronic pancreatitis. Invasive treatment (surgical or endoscopic) is indicated 6 weeks after the diagnosis if larger than 6 cm in size or presence of symptoms. Laparoscopic treatment of P.Ps enables definitive drainage.

Aim: To assess the feasibility, safety and efficacy of laparoscopic cystogastrostomy (posterior approach) for management of P.Ps.

Material and Methods: 9 patients underwent laparoscopic cystogastrostomy posterior approach for management of P.Ps. All the cysts were none resolving, symptomatic and larger than 6 cm.

Results: The procedure were completed laparoscopically in 8 cases (88.9%), with mean operative time (158.33 ± 24.62) min, mean hospital stay (8.78 ± 1.99) day, no mortality or major complications occurred. All the patients showed resolution of the cysts 2 months post operatively.

Conclusion: Laparoscopic cystogastrostomy posterior approach for management of P.Ps is feasible, effective and safe, larger studies are needed for better evaluation.

Keywords: Laparoscopic cystogastrostomy posterior approach.
Abstracts

PP3-018
Laparoscopic Longitudinal Pancreaticojejunostomy Using Barbed Suture: An Easy and Secure Solution for Pancreatic Duct Obstructions with Chronic Pancreatitis

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Background: We described our technique of laparoscopic longitudinal pancreaticojejunostomy (LPJ) using barbed suture to manage pancreatic duct obstruction.

Methods: We performed the laparoscopic longitudinal anterior pancreaticojejunostomy using barbed suture (3-0 absorbable wound closure device, V-LocTM, Covidien, USA) in 11 patients who presented signs of pancreas ductal obstruction with chronic pancreatitis. The surgical outcomes and follow-up record at outpatient department were reviewed and effectiveness and feasibility of this method were preliminarily analyzed.

Results: Mean age was 54.4 ± 9.5 years and all patients successfully achieved the removal of pancreatic duct stone without conversion to laparotomy. Overall operative time was 200.7 ± 56.4 minutes and estimated blood loss was 42.2 ± 11.2 ml. There was no case of pancreas anastomosis leakage or postoperative bleeding. Mean length of hospital stay was 6.5 ± 0.8 day and start to soft diet was 4.8 ± 0.7 day. In terms of chronic pain, no patient complained abdominal pain after surgery and all patients recovered without significant complications or relapse of pancreatitis. Follow-up period of the patients ranged from 4 to 21 months.

Conclusions: Our newly introduced technique of laparoscopic longitudinal anterior pancreaticojejunostomy (Puestow procedure) using barbed suture is a potentially easy and minimally invasive procedure for patients who suffer from pancreatic duct obstruction with chronic pancreatitis.

Keywords: Chronic pancreatitis, Laparoscopy, Longitudinal pancreaticojejunostomy.

PP3-019
Total Laparoscopic Pancreatoduodenectomy Using a New Technique of Pancreaticojejunostomy with Two Transpancreatic Sutures with Buttresses

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Background: Laparoscopic pancreatectoduodenectomy (LPD) is advantageous as a minimally invasive surgery, but performing the complicated anastomosis is technically difficult. Herein, we present our experiences with total laparoscopic pancreatectoduodenectomy (TLPD) using a unique anastomosis technique, that is, pancreaticojejunostomy using only two transpancreatic sutures with the buttresses method ( PJt).

Methods: From September 2013 to March 2015, twelve TLPDs using PJt for periampullary tumors were performed. In each case, the pancreaticoenteric anastomosis was performed using the PJt technique, a modification of invaginated, end-to-end pancreaticojejunostomy. A pair of transpancreatic sutures were placed on the upper and lower borders of the implanted pancreas through the jejunal limb covering the pancreas stump, and four buttresses were used to reinforce the anastomosis. All medical records and follow-up data were reviewed and analyzed with regard to surgical outcomes, and the results were compared with previously published reports on TLPD.

Results: The mean age of the patients was 64.3 ± 12.3 years, and all were diagnosed with pancreas head cancer except five patients (four patients had ampulla of Vater cancer and the other had chronic pancreatitis). The mean estimated blood loss was 118 ± 57 ml and the mean hospital stay was 12.5 ± 4.5 days. The mean operative time was 411.6 ± 59.2 minutes, and the pancreas anastomosis time was fairly short, 20.1 ± 4.8 minutes, without any evidence of anastomosis-related complications.

Conclusions: Our novel technique of pancreaticojejunostomy with two transpancreatic sutures with buttresses is a simple, easy and feasible method for TLPD that will decrease the burden on the surgeon and ensure secure anastomosis.

Keywords: Pancreaticojejunostomy, Laparoscopy, Pancreatoduodenectomy.

PP3-020
Da-Vinci Robotic Surgical System Combining with Intraoperative Ultrasound Localization for Precise Resection of Insulinoma: A Summary of Single-Center Experience in 97 Patients

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Objectives: To evaluate the effect and safety of enucleation of insulinoma under the Da Vinci robotic surgical system combination with intraoperative ultrasonography (IOUS) for the localization.

Methods: The clinical materials of 97 insulinoma cases which underwent IOUS and assisted by the robotic surgical system from September 2012 to May 2016 in Peking Union Medical College Hospital were reviewed retrospectively. We calculated the diagnostic accuracy rate, operation time, blood loss, complications and cure rate.

Results: The locations of tumors were 23 in the head, 43 in the body and 28 in the tail of pancreas, 2 were multiple insulinoma, 1 was ectopic to mesenterium. The average operation time was 152 minutes; the average blood loss was 131 ml. 4 (4.1%) patients were transformed to open. 1 patients experienced postoperative bleeding about 300 ml in POD7 and no infection and perioperative death. 22 (22.7%) cases were of class B and 2 (2.1%) of class C according to the clinical grading of postoperative pancreatic fistula. The blood glucose 60 minutes after tumor dissection was significantly elevated than that before operation (6.23 ± 1.78 mmol/l vs. 5.31 ± 1.35 mmol/l).

Keywords: Da Vinci surgical system, Insulinoma, Robotic surgery.
3.73 ± 1.20 mmol/l, P = 0.024). The cure rate was 100% as all the patients’ symptoms were disappeared during follow-up time. 1 (1.0%) patient was found tumor recurrence in pancreas without any symptom 12 months after operation.

**Conclusion:** Combination IOUS is a highly sensitive method for the localization of insulinoma, which is helpful in localizing tumors precisely in insulinoma cases assisted by robotic surgical system and shortening operation time. It was safe and effective for insulinoma enucleation.

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**PP3-022**

**Comparison Analysis of Central Pancreatectomy: Open vs. Minimally Invasive Approach**

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**Introduction:** We compared the surgical outcomes between open central pancreatectomy (OCP) and minimally invasive central pancreatectomy (MCP, robotic and laparoscopic).

**Methods:** Clinicopathologic data of the patients who underwent central pancreatectomy (CP) from February 1993 to June 2014 in Severance Hospital were retrospectively reviewed.

**Results:** Total twenty one patients underwent CP with mean age of 45.8 ± 14.6 years. OCP was done in 11 patients and 10 patients were underwent MCP (robotic 7, Laparoscopic 3). In comparison analysis, male/female ratio was not different (4/7 vs.1/9, p = 0.311). Preoperative symptoms were more frequently in OCP (7 (63.7%) vs. 0 patient, p = 0.004). OCP was performed in 7 (63.6%) in period 1 (1993–2005) and 4 (36.4%) patients in period 2 (2006–2014), otherwise all MC were done in period 2 (p = 0.004). Mean age and hospital stay were not different (40.4 ± 16.7 vs. 51 ± 9.6 years, p = 0.081; 21.1 ± 13.0 vs. 18.3 ± 12.1 days, p = 0.607). Mean tumor size was smaller in MCP with marginal significance (5.5 ± 6.1 vs. 1.4 ± 0.2, p = 0.051). Total operation time was longer in MCP (286.8 ± 92.1 vs. 419.0 ± 76.3 min, p = 0.004). Estimated blood loss was much in OCP (807.1 ± 467.6 vs. 280.0 ± 179.6 ml, p = 0.005). In treating remnant distal pancreas, PJ was frequently done in OCP, otherwise PG was more performed in MCP (10 vs. 1 in OCP, 2 vs. 8 in MCP, p = 0.002). There was no difference in postoperative complications (45.5 vs. 50%, p = 0.835).

**Conclusion:** Even MCP had longer operation time, it is recently more applied with less blood loss and similar surgical outcomes.

**Keywords:** Central pancreatectomy, Open, Minimally invasive.

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**PP3-023**

**Reinforcement of Choledochotomy Closure Suture Line by Fibrin Glue in Patients Undergoing Laparoscopic Common Bile Duct Exploration – A Pilot Study**

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**Introduction:** Laparoscopic common bile duct exploration (LCBDE) allows cholecystectomy and the removal of common bile duct (CBD) stones to be performed during the same sitting. Biliary leakage post operatively is an important complication. In this study we tried to further lower the incidence of bile leakage by using fibrin glue to reinforce the sutures put on choledochotomy suture line.

**Methodology:** 20 patients with CBD stones were included in this study. Patients were randomized into two groups namely...
Group A in which choledochotomy was closed with polyglactin 4-0 suture and suture line reinforced with fibrin glue, and Group ‘B’ in which choledochotomy was closed with polyglactin 4-0 suture alone. Both the groups were evaluated and compared on clinical parameters such as operative time & content, drain output, blood loss, length of postoperative hospital stay.

**Results:** In Group A, there was no case of bile leak but there was bile leak in 2 cases in Group B, minimum 0 and maximum 900 ml (mean 97 ml) and p value of 0.147 with no statistically significant difference. The minimum & maximum serous drainage in Group A was nil & 80 ml (mean 11 ml) and in Group B was nil & 270 ml (mean 72.50 ml), p value of 0.028 which is statistically significant. The patients in Group A stayed in hospital postoperatively from 3 to 8 days (mean: 5.30) while in Group B it ranged from 3 to 10 days with a mean of 5 days.

**Conclusion:** Fibrin glue application on CBD decreases bile leakage but in statistically insignificant manner. Fibrin glue application on CBD can significantly decrease post operative serous drainage after LCBDE.

**Keywords:** Bile leak, Fibrin glue, LCBDE, Serous leak.

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**PP3-024**

**Initial Experience of Laparoscopic Cholecysto-Cholangiography and Liver Biopsy for Diagnosis of Prolonged Jaundice in Infants**

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**Purpose:** Cholangiography is often crucial for establishing the definitive diagnosis in infants with prolonged jaundice. Here, we describe our protocol of using the three-hole laparoscopic technique.

**Methods:** Retrospective chart review was conducted of all patients who underwent a laparoscopic cholecysto-cholangiography from 2014 to 2015. A 5-mm umbilical port is introduced for a 30 degrees laparoscope. Additional 3-mm trocars were inserted at right subcostal and epigastric incision respectively. A liver biopsy was performed first. The fundus of gallbladder was punctured using 3 french double J ureteral catheter for cholangiography. Puncture site was clipped.

**Results:** A total of 5 infants (3 boys) aged 49–86 (median 62) days underwent laparoscopic-assisted cholecysto-cholangiography for prolonged jaundice. In all 5 cases, the technique identified a patent bile duct system. The average duration of operation was 48 min (range 25–60 min). There was no bleeding or any other complications intraoperatively.

**Conclusion:** Laparoscopic cholecysto-cholangiography is simple and safe method to and allows the anatomic structure of the biliary tree to be obtained accurately with minimal surgical intervention avoiding unnecessary laparotomy.

**Keywords:** Jaundice, Infant, Laparoscopy, Cholangiography.

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**PP3-025**

**Appropriate Timing of the Laparoscopic Surgery for Acute Cholecystitis Using Propensity Score Matching**

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Tokyo Guidelines 2013 (TG13) recommended early laparoscopic cholecystectomy (ELC) for acute cholecystitis (AC) within 72 hours from onset of symptom to surgery. However, ELC may not always be possible for many reasons such as operative room availability, surgeons available, patient’s conditions, etc. In the present study, we analyzed an appropriate timing of the laparoscopic cholecystectomy (LC) for AC using propensity score matching.

Severity grades revealed 53.6% in mild AC, 45.5% in moderate AC, and 0.9% in severe AC. Preoperative gallbladder (GB) drainage was performed 30.8% of patients with AC. The rate of conversion to open surgery was 7.1% and the postoperative complication was 4.5%. We performed propensity score matching (PSM) using 13 characteristics including patients background (age, sex, BMI), duration from onset to admission, Charlson comorbidity index, body temperature), examination findings (WBC counts, CRP value, T-Bil, severe local inflammation, severity grades according to TG13), and therapeutic factors (preoperative GB drainage and surgeons experience).

**Keywords:** Acute cholecystitis, Propensity score matching, Tokyo guidelines, ELC, AC.

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**PP3-026**

**Clinical Outcome of IVR for Post Pancreatecoduodenectomy Hemorrhage**

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**Aim:** To evaluate the outcome of interventional radiology (IVR) for post pancreatecoduodenectomy hemorrhage.

**Method:** From January 2005 to January 2015, clinical data of 437 patients who had undergone pancreatecoduodenectomy (PD) in our institution, were analyzed retrospectively.

**Result:** Eight of 437 patients (1.8%) had post pancreatecoduodenectomy hemorrhage from ruptured pseudoaneurysms. The diagnosis was pancreatic cancer (n = 4), distal bile duct cancer (n = 2), ampullary cancer (n = 1) and duodenal neuroendocrine tumor (n = 1). Concomitant portal vein resection was performed in 2 cases. The initial symptoms were intra-abdominal bleeding (n = 7), gastrointestinal bleeding (n = 2) and abdominal pain (n = 2). In these patients, 5 patients developed hypovolemic shock. Sentinel bleeding was observed only in 2 cases. All patients underwent diagnostic angiography and endovascular treatment, transcatheter arterial embolization (TAE). The median interval from PD to the onset of the hemorrhage was 20 days. Bleeding sites were located in the gastroduodenal artery stump (n = 6),
right hepatic artery (n = 1), and splenic artery (n = 1). Pancreatic fistula was evident in 6 cases of all gastroduodenal artery stump cases. The initial clinical success rate of TAE was 87.5%. Although, hepatic infarction and abscess were observed in 3 and 2 cases, respectively, no hepatic failure was observed most probably due to the development of collateral arteries after embolization. The duration of postoperative hospital stay was 61 days. Only 1 patient died due to multiple organ failure 135 days after the surgery.

Conclusion: All cases of post pancreaticoduodenectomy hemorrhage were saved with appropriate IVR treatment. TAE can be performed safely in most patients and is an effective treatment option.

Keywords: Post pancreaticoduodenectomy hemorrhage, IVR, TAE.

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**PP3-027**

**The Analysis of Expression of CCK and IP3 Receptors in Gallstones Patients with Type 2 Diabetes Mellitus**

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**Background:** Type 2 diabetes mellitus (T2DM) is correlated with gallbladder diseases. But there are no studies on bile component analysis including the cholecystokinin-A (CCK) and Inositol1,4,5-trisphosphate (IP3) receptors on gallbladder wall.

**Aim:** To investigate the expression of CCK and IP3 receptors in patients with gallbladder stones and T2DM and its correlation with the hypomotility of the gallbladder.

**Methods:** 26 patients with gallstones and T2DM (Group 1) and 24 gallstones patients without T2DM (Group 2) were enrolled in this study. The emptying function of the gallbladder was measured by ultrasonography. CCK concentration was measured by immune-histological analysis in fasting status (CCK-f) and in 30 min after lipid test meal (CCK-30). The activity of CCK-R was analyzed by radioligand method and the IP3-R antibody was used to detect the IP3-R from patients in both groups.

**Results:** Gallbladder ejection volume (EV) [(11.6 ± 5.1) ml3 vs. (21.5 ± 7.8) ml3 ] and gallbladder ejection fraction (GBEF2)%( [17.2 ± 11.3] ml3 vs. (52.8 ± 12.9) ml3 ] were significantly lower (P < 0.01) in patients with gallstones and T2DM. The amount of CCK-R and the activity of CCK-R in Group 1 were significantly lower than that in Group 2 (P < 0.01). And IP3-R in Group 1 was much lower than that in Group 2, as well (P < 0.01).

**Conclusion:** The expression of CCK-R and IP3-R in gallstones patients with T2DM was much lower in such patients, leading to impaired gallbladder emptying function and the formation of gallstones.

**Keywords:** Cholecystokinin, Inositol1,4,5-trisphosphate, Gallstone, Type 2 diabetes mellitus.

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**PP3-028**

**Outcome of Surgical Management of Laparoscopic Cholecystectomy-Related Major Bile Duct Injuries**

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**Objectives:** Laparoscopic cholecystectomy (LC)-associated bile duct injury (BDI) is a clinical problem with poor outcome. The study aimed to analyze the outcome of surgical management of these injuries.

**Patients and Methods:** We retrospectively analyzed 69 patients underwent surgical management of LC related major BDI, in the period from mid 2011 to mid 2015.

**Results:** Regarding injury type; the Leaking, Obstructing, leaking and obstructing, leaking and vascular, and obstructing and vascular injuries were 43.5%, 27.5%, 18.8%, 2.9%, and 7.2% respectively. However, external biliary fistula affected 60.9%. The Strasberg classification of injury was as follow: D = 1, D, E1 = 2, D, E2 = 5, E1 = 22, E2 = 27, E3 = 8, and E4 = 4. The definitive procedure was as follow: Iry repair with stent, End to end anastomosis with stent, HJ with stent, Rt hepatectomy plus biliary reconstruction with stent, and HJ in 1.4%, 2.9%, 58%, 8.7%, and 29% of patients respectively. According to time of definitive procedure from injury; the immediate (before 72 h), intermediate (between 72 h and 1.5 months), and late (after 1.5 months) management were 13%, 14.5%, and 72.5% respectively. The hospital and 1 month (early) morbidity after definitive treatment were 21.7%, while, late biliary morbidity was 17.4% however, the overall mortality was 2.9%, on the other hand, late biliary morbidity free survival was 79.7%. On univariate analysis, the following factors were significant predictors of early morbidity; Sepsis at referral, E4 injury, associated vascular injury, intra-operative bleeding with blood transfusion, liver cirrhosis and longer operative times and hospital stays. However, the following factors were significantly associated with late biliary morbidity; Sepsis at referral, operations other than HJ, Reconstruction without stenting, liver cirrhosis, operative bleeding and early morbidity.

**Conclusion:** Sepsis at referral, cirrhosis and operative bleeding were significantly associated with both early and late morbidities after definitive surgical treatment of LC related major BDI.
Objective: For complicated large difficult CBD stones that cannot be extracted by ERCP, patients can be managed safely by open or laparoscopic CBD exploration. The aim of this study was to assess these surgical procedures of CBDE after endoscopic failure.

Methods: We retrospectively reviewed and analyzed 85 patients underwent surgical management of large difficult CBD stones after ERCP failure, in the period from mid 2011 to mid 2015. The overall male/female ratio was 27/58.

Results: Sixty seven (78.8%) and 18 (21.2%) of our patients underwent single and multiple ERCP sessions respectively with significant correlation between number of ERCP sessions and post ERCP complications (P = 0.001). Impacted large stone was the most frequent cause of ERCP failure (60%). LCBDE and OCBDE were 29.4% (n = 25) and 70.6% (n = 60) respectively. Primary CBD repair, T-tube insertion, HJ and TDS were done in 45.9%, 40%, 8.3% and 5.9% respectively. The mean operative time and hospital stay were 185 ± 61.4 minutes and 4.9 ± 2.07 days respectively. Eleven (12.9%) of our patients had post operative complications without mortality. By comparing LCBDE and OCBDE groups, patient age and hospital stay were significantly lower in laparoscopic group, while, T-tube insertion, choledocoscope use, operative time and post operative bile leak were significantly higher. Furthermore, patients underwent choledocoscope had significant direction to primary CBD repair and lower missed stones rate. While, on comparing T-tube with primary closure of CBD groups, there was significant lower operative time and hospital stay in the later.

Conclusion: Large difficult CBD stones can be managed either by open surgery or laparoscopically with acceptable comparable outcomes with no need for multiple ERCP sessions due to their related morbidities; furthermore, choledocoscope has a good impact on stone clearance rate with direction towards doing primary repair that is better than T-tube regarding operative time and hospital stay.

Keywords: CBD stones, ERCP failure.

Objective: Improved laproscopic experience, the magnification available and the availability of newer tools and instruments like the ultrasonic shears made laparoscopic cholecystectomy (LC) a feasible option in cirrhotic patients, the aim of this study was to analyze the outcome of LC in cirrhotic patients, and the rule of harmonic device.

Patients and Methods: We retrospectively analyzed 70 cirrhotic patients underwent LC, in the period from mid 2011 to mid 2016; the overall male/female ratio was 38/32.

Results: The Child-Turcotte-Pugh (CTP) score A, B, and C were 64.3%, 31.4%, and 4.3% respectively, while the mean MELD score was 10.1 ± 4.4. The most frequent cause of cirrhosis was HCV (88.6%), while biliary colic was the most frequent presentation (85.7%). Harmonic device was used in 40% of patients (n = 28), and on comparing patients with and without harmonic use, there were significant lower operative bleeding rate, less amount of blood and plasma transfusion, shorter operative time and hospital stay, and lower conversion and morbidity rates in the former. The conversion rate was 7.1%, and its significant predictors were CTP score B, none harmonic group, and operative bleeding, however, the morbidity rate was 22.9% (n = 16), and its significant risk factors were CTP score B, C, none harmonic group, operative bleeding, increased MELD score, blood and plasma transfusion units, decreased platelet count and longer operative time. The mortality rate was 1.4% (n = 1).

Conclusion: LC can be safely performed in cirrhotic patients with appropriate patient selection. However, operative bleeding increased blood and plasma transfusion units, CTP, MELD scores and decreased platelet count are predictors of poor outcome that can be improved by using harmonic device.

Keywords: Laparoscopic cholecystectomy, Livercirrhosis, Harmonic device.
PP3-031
A Simple Pancreaticojejunostomy Technique for Hard Pancreases Using Only Two Transpancreatic Sutures with Buttresses: A Comparison with the Previous Pancreaticogastrostomy and Dunking Methods
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Purpose: In this study, we introduced a novel technique, the pancreaticojejunostomy (PJ), which uses only two transpancreatic sutures with buttresses (PJt), and compared the surgical outcomes with previously used methods, especially for hard pancreases.

Methods: A total of 101 patients who underwent pancreaticoduodenectomy with hard pancreases were enrolled and divided into three groups according to the method of pancreaticenteric anastomosis: 30 patients (29.7%) underwent the conventional dunking method (Du), 31 patients (30.7%) underwent pancreaticogastrostomy using transpancreatic sutures (PGt) and 40 patients (39.6%) underwent pancreaticojejunostomy using transpancreatic sutures (PJt). The surgical outcomes were compared according to the type of anastomosis to analyze the feasibility and ease of each technique.

Results: The overall operative time was shorter in the PJt group (325.1 ± 63.8 minutes) than in the PGt group (367.3 ± 70.5 minutes) or the Du group (412.0 ± 38.2 minutes, p = 0.000). In terms of pancreaticoenteric anastomosis time, it was also shorter in the PJt group (10.3 ± 3.5 minutes) than in the Du group (20.7 ± 0.7 minutes) or the PGt group (16.8 ± 5.4 minutes, p = 0.005). Significant postoperative pancreatic fistula (POPF) developed in two cases (6.7%) in the Du group, whereas there were no POPF cases in the PGt or PJt groups (p = 0.086). Overall postoperative morbidities occurred in 31 cases (30.7%), and there were no significant differences among the three groups (p = 0.692).

Conclusions: The novel PJ technique, which uses only two transpancreatic sutures with buttresses, is a very simple, easy and secure method for hard pancreases and can be performed in a shorter amount of time compared with conventional methods.

Keywords: Hard pancreas, Pancreaticoduodenectomy, Pancreaticojejunostomy.

PP3-032
Age Does Not Affect Complication and Overall Survival Rate after Pancreaticoduodenectomy: Single-Center Experience and Systematic Review of Literature
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Aim: We aimed to evaluate the feasibility of pancreaticoduodenectomy in elderly patients.

Method: We retrospectively analyzed data of 208 patients who underwent pancreaticoduodenectomy between 2008 and 2015. The patients were divided into two groups: patients aged <70 years (n = 117) and those aged ≥70 years (n = 89). To update the outcome of pancreaticoduodenectomy in elderly patients, we performed a systematic review of published work.

Result: The preoperative patient characteristics were similar between the two groups except for hypertension, which was significantly more frequent in the older group (25% vs. 52%; p < 0.001). There was no difference in the mortality (0% vs. 1%; p = 0.43) or morbidity (26% vs. 20%; p = 0.41) rates between the two groups. The overall survival rate in patients with pancreatic cancer between the two groups did not differ (p = 0.40). Thirty-five studies, including our own, were identified in the published work. The overall median morbidity and mortality rates of the elderly patients were 49% (range, 20%–78%) and 4.3% (range, 0%–13%), respectively.

Conclusion: Pancreaticoduodenectomy is feasible in elderly patients with acceptable morbidity and mortality rates.

Keywords: Pancreaticoduodenectomy, Elderly, Complication.

PP3-033
Causative Effect and Measures of Peripancreatic Bacterial Infection on Pancreatic Fistula after Pancreatoduodenectomy
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Background and Aim: Early bacterial contamination in the ascitic fluid after pancreaticoduodenectomy (PD) may be an initiating event that leads to the development of clinically relevant pancreatic fistula (CR-POPF). We investigated the relationship between CR-POPF and bacteria isolated from the drain fluid to elucidate the mechanism of bacterial infection associated with CR-POPF after PD.

Methods: One hundred thirty-nine consecutive patients underwent PD at our institute from 2012 to 2015. Microbial culture was routinely obtained from the drain fluid on postoperative day (POD) 1, 3, and 6. The relationship between CR-POPF and clinical factors was assessed by univariate and multivariate analysis.
Results: CR-POPF occurred in 34.5%. In univariate analysis, significant predictors of CR-POPF were age >70 years (p = 0.043), estimated blood loss (p = 0.009), smaller pancreatic duct (p = 0.001), soft pancreas (p < 0.001) and bacterial contamination in the drain fluid on POD1 or 3 (p < 0.001). In multivariate analysis, smaller pancreatic duct (Odds ratio (OR) = 2.93, p = 0.032), soft pancreas (OR = 3.45, p = 0.023), and bacterial contamination in the drain fluid on POD1 or 3 (OR = 6.58, p < 0.001) were independent predictors of CR-POPF. The most commonly isolated bacteria on POD1 or 3 were Enterococcus sp. (30.2%), Pseudomonas aeruginosa (9.3%), and Enterobacter sp. (9.3%). Furthermore, imipenem (92.9%), meropenem (84.0%) and levofloxacin (92.9%) had strong sensitivity for them. In contrast, on POD6, Staphylococcus aureus (92.9%), meropenem (84.0%) and levofloxacin (92.9%) had ruginosa ascitic fluid were absent due to prevent retrograde infection.

Conclusions: Early bacterial contamination of the ascitic fluid might be responsible for CR-POPF. Therefore, it is important to prevent the surgical field from becoming contaminated with enteric bacteria intraoperatively and to perform the early administration of more sensitive antibiotics. Drains should be early removed when clinically CR-POPF and early bacterial contamination of the ascitic fluid were absent due to prevent retrograde infection.

Keywords: Pancratoduodenectomy, Pancreatic fistula, Pancreatic bacterial infection, Maicrobial culture from drain fluid.

PP3-034
Perioperative Transfusion: Is It a Real Prognostic Factor of Periampullary Cancer Following Pancratoduodenectomy?

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Background/Purpose: We analyzed our data to clarify the prognostic significance of red blood cell (RBC) transfusion (preoperative, intraoperative, postoperative) following PD for periampullary cancers.

Methods: We analyzed 244 periampullary cancers treated by PD from June, 2001 to June, 2010 (pancreatic cancer 124 cases, bile duct cancer 63 cases, ampullary cancer 57 cases) in National Cancer Center, Korea.

Results: A total of 112 (46%) of the 244 patients have received perioperative; altogether, 41 patients (17%) underwent intraoperative transfusion (preoperative 5%, postoperative 37%). The 5-year survival rate of 244 periampullary cancer patients was 31%. The 5-year survival rate of patients without perioperative transfusion was 36%, whereas that of patients with a transfusion was 25% (p = 0.045). Following multivariate analysis, perioperative transfusion and intraoperative transfusion were found to be independent poor prognostic factors for those with periampullary cancer (relative risk 1.52 and 1.95). Among those with pancreatic cancer, in subgroup analysis, the overall 5-year survival rate was 18%, and the 5-year survival rates for patients with (n = 62) or without (n = 62) transfusion were 17% and 20%, respectively, which did not reach statistical significance (p = 0.214). For those with bile duct cancer, the overall 5-year survival rate was 37%, and there was no survival difference between transfused (n = 29) and untransfused (n = 34) patients. In ampullary cancer group, lastly, the overall 5-year survival rate was 54%, and there was no survival difference between transfused (n = 21) and untransfused (n = 36) patients. And there was no statistical significant relation between transfusion and disease prognosis after resection.

Conclusions: In the present study the reason was not clear, intraoperative transfusion was one of the independent significant prognostic factor for periampullary cancer. So, for patients with periampullary cancer, minimization of intraoperative bleeding may be mandatory.

Keywords: Blood transfusion, Pancreatoduodenectomy, Periampullary cancer.

PP3-035
Better Outcome of Splenectomy in Younger Patients Suffering from Chronic Immune Thrombocytopenia (ITP). A Developing Country Perspective

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Background: Adult chronic immune thrombocytopenic purpura (ITP) is an autoimmune disorder manifested by thrombocytopenia from the effects of antiplatelet autoantibodies and T lymphocyte–mediated platelet cytotoxicity. Initially, most ITP patients are treated with medical therapy; if no lasting response occurs, they undergo splenectomy. The aim of this study was to explore the results of splenectomy in chronic immune thrombocytopenia and to analyze factors which can predict better response of splenectomy in patients undergoing surgery.

Material and Methods: The retrospective charts review comprised of adult patients over 16 years of age who underwent splenectomy for Idiopathic Thrombocytopenic Purpura at Aga Khan University Hospital, Karachi, from october 2005 to September 2015. Data was reviewed in January 2016 by a surgical resident. Files of all 51 patients who underwent splenectomy for ITP during this period were retrieved. Preoperative status was assessed in terms of number of platelet count, time since diagnosis of ITP and medical options used till undergoing splenectomy for ITP. The outcome was the response to splenectomy as per the new definition of response set by the American Society of Hematology 2011 evidence based practice guidelines for Idiopathic Thrombocytopenic Purpura. Assessment of response in terms of platelet count was done up till 12 months post splenectomy. Secondly, factors were analyzed which can predict better response prior to surgery alongside possible complications associated with surgical procedure. SPSS 19 was applied for statistical analysis.

Results: A total of 51 patients was found eligible. Of them, 14 (27.5%) were males and 37 (72.5%) were females with an overall median age at the time of splenectomy of 32 years (range: 16–65 years). Out of 51 cases, 22 (43.1%) patients underwent open splenectomy, 22 (43.1%) laparoscopic and 7 (13. %) had started laparoscopically, but converted to open splenectomy. Complete response was achieved in 43 (84.3%) patients, whereas 2 (4%) had response and 6 (11.7%) had no response. Relapse rate after showing initial response at 1 year of follow up was 8.8%.
Conclusion: Splenectomy is a safe and effective option in refractory cases of immune thrombocytopenia. Young age at time of surgery is associated with good outcome, while resistant to prior type or numbers of medical therapy has nothing to do with the outcome. In our response to splenectomy in adult idiopathic Thrombocytopenic Purpura patients was comparable to reported rates in literature with relatively lower morbidity and mortality.

Keywords: Idiopathic thrombocytopenic purpura, Splenectomy, Response, Platelet.

PP3-036
Perioperative Management and Outcome after Total Pancreatectomy
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Background: This study aimed to assess the operative outcome of a single institution series of TP retrospectively.

Method: From May 2006 to May 2016, 24 consecutive patients who had undergone curative TP. (Study 1) Study 1 was to investigate the operative outcome in our hospital. (Study 2) This study population was divided into two groups based on the period retrospectively, 12 patients were early period group from 2006 to 2011, and the other patients were late period group from 2012 to 2016. Patients of early period group took pancreatin mainly, and of late period group took pancrelipase.

Result: (Study 1) The median age was 70.5-year-old. About half of patients had several comorbidity, heart, pulmonary, renal, and diabetes mellitus. The median insulin dose was 19 IU/day, and the median hemoglobin A1c was 6.7% at discharge. 20 patients could be rehabilitated. (Study 2) Total protein at 3 months and 24 months after surgery was significantly different (P < 0.05). But other nutrition status was not significantly different (body weight loss, Albumin, ChE, Cholesterol, Hb A1c).

Summary: In this study, systemic and nutritional status of the patients had undergone TP was within the acceptable range preoperatively, but it was necessary consideration to the pre-operative management because of several comorbidities. In addition, TP tends to be increased surgical stress in order to ensure the curability, so it was not even less mortality. However, it can be also periparotid and post-operative management, so it is possible adaptation if there is sufficient consideration to the patient’s background and it has been expected for improving the prognosis. It seemed that it was necessary long-term careful follow-up sequentially.

Keywords: Total pancreatectomy, Perioperative management.

PP3-037
Radical Pancreatectomy with Artery-First Approach Based on Tumor-Infiltrated Site in Pancreatic Cancer: Surgical Technique to Obtain Complete Tumor Resection and Its Outcomes
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Background: To work toward the only potential cure, R0 resection is strongly desired in pancreatic cancer (PC). Here we report two artery-first approaches, i.e., pancreatocoduodenectomy with total meso-pancreatoduodenal excision (tMPDe) and radical antegrade modular pancreatectoduodenectomy with superior mesenteric artery (SMA)-first technique (s-RAMPS), to secure R0 in PC.

Methods: Advanced PCs typically spread in two directions, i.e., toward the hepatic artery (HA) and SMA in pancreatic head cancer and toward the celiac axis (CeA) and SMA in pancreatic body or tail cancer. Our artery-first approaches are based on the site of tumor infiltration. As a first step of the procedure, the HA- or SMA-first approach in the tMPDe and the SMA- or CeA-first approach in the s-RAMPS should be conducted to make sure an R0 resection or an appropriate decision to terminate the surgical procedure before reaching the ‘point of no return.’

Results: A total of 115 consecutive PC patients underwent pancreatectomy between May 2006 and August 2015. Forty-nine patients received a conventional pancreatectomy (cPx), while 66 cases underwent an artery-first pancreatectomy (aPx). A surgical margin was designated ‘R0’ if no tumor cells were identified at any of the resection margins. Panreatocoduodenectomy, distal pancreatectomy and total pancreatectomy were performed in 26, 23 and zero patients in the cPx and 42, 21 and 3 patients in the aPx, respectively. The aPx procedure was performed safely without any intraoperative complications. Blood loss in the aPx was 500 ml (median, range: 40–2,880) and it was fewer than that (1340 ml; median, rang: 140–4,359) in the cPx (p < 0.001). R0 was achieved in 73% in the cPx and 90% in the aPx (p < 0.048). Five years survival rates were 22.1% in the cPx and 31.8% in the aPx.

Conclusion: Artery-first approach provided a high R0 rate with favorable outcome.

Keywords: Pancreatic cancer, Artery-first approach, Surgical technique.

PP3-038
Preoperative Fecal Elastase-1 Is Used as Predictive Prognostic Marker of Pancreatic Adenocarcinoma
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Introduction: The clinical relevance of the fibrosis regarding tumor progression is supported by the correlations seen between poor outcomes. Pancreas cancer has a massive fibrotic stoma, that

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is, desmoplasia, which contributes to the local inflammatory environment. Pancreatic fibrosis is thought to be responsible for occlusion of the pancreatic duct by a tumor, chronic inflammation of the tumor, or by chronic pancreatitis and finally the loss of exocrine pancreatic function. Fecal elastase-1 (FE-1) level has been used to assess moderate to severe exocrine dysfunction of the pancreas and predict pancreas fibrosis. The aim of this study was to assess the impact of FE-1 on the prognosis of pancreas cancer patients.

Methods: Between January 2006 and December 2014, 136 patients with pancreatic adenocarcinoma underwent R0 resection at Gangnam Severance Hospital, Seoul, Korea. Patients were classified into two groups according to the preoperative FE-1; ‘normal’ (FE-1: ≥200 μg/g), ‘reduced’ (FE-1: <200 μg/g). We evaluated disease free survival (DFS) and overall survival (OS).

Results: Median preoperative FE-1 level was 130.050 μg/g (IQR 32.000; 238.300). 63 patients had reduced pancreatic function, 31 patients had normal pancreatic function. Median Disease free survival (DFS) was 9.0 months. Two groups had significantly different DFS (p < 0.001). In the multivariate analysis, normal FE-1 level and no lymph node metastasis was found to be an independent prognostic factor for DFS. (p < 0.001, p < 0.041 respectively).

Conclusion: Pancreas fibrosis is a significant, unfavourable prognostic factors for pancreas cancer after curative resection. FE-1 is simple and non invasive predictive clinical marker for prognosis of pancreatic cancer.

Keywords: Pancreatic cancer, Fecal elastase, Pancreatic adenocarcinoma, Prognostic factor.

Abstracts

PP3-039
Is It Justified Perform an Arterial Resection in Patients Affected by Pancreatic Cancer?

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Pancreatectomy associated to vascular resection is still under discussion; venous resection de-monstrated to be a feasible technique in experienced center, increasing survival. In contrast, arterial resection is still an issue of controversial debate, continuing to be a contraindication for resection in most of the center. However, in the last years, few authors are showing their results with pancreatic surgery associated to arterial resection with acceptable morbidity, mortality and long-term survival rates. These outcomes are achieved thanks to better technical procedures, in highly selected patients, in experienced HPB center in light of the last neoadjuvant treatment.

Because of its anatomical location, common hepatic artery (CHA), celiac trunk (CT) and superior mesenteric artery (SMA) are the arterial vessels most frequently involved. Less frequently, mainly because tumor location, right hepatic artery (RHA) might be involved as well.

Main objective of the surgery must be achieving an oncological resection with free margins (R0), fundamental condition with which future therapeutic options may improve survival.

The present paper show the surgical technique performed and the results obtained in our hospital in patients surgically resected with pancreatic cancer and arterial involvement.

We demonstrate the technical aspects of surgical resection and expose the technical and oncological arguments to justify this aggressive but necessary surgical treatment in a selected number of patients.

PP3-040
Implication of Fast Track after Pancreatectomy Using Propensity Score Matching

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Background: It has been regarded as difficult to apply enhanced recovery after surgery (ERAS) after pancreatic surgery due to high complications. Recently, there were some reports on the feasibility of the implementation of ERAS after pancreatectomy. However, few comparative studies were reported between pre and post ERAS after PD.

Method: Patients who underwent PD for malignant or benign pancreatic lesions were enrolled between January 2008 and September 2014. They were classified into conventional management (CM) and ERAS groups using propensity score matching to reduce the bias due to confounding factors on the basis with preoperative and intraoperative variables. Postoperative complication, hospital stay, and readmission rate were evaluated between two groups retrospectively.

Results: Complication rate (p = 0.658) and severity (p = 1.000) were not different between two groups. ERAS group showed lower incidence of wound problem compared with CM group (p = 0.070). Hospital stay was shorter in ERAS group before applying PSM (p = 0.032). Age over 70 (P = 0.029; OR = 1.665; 95% CI 1.051–2.656), before ERAS (P = 0.001; OR = 2.054; 95% CI 1.299–3.272), pancreatic fistula (P < 0.001; OR = 5.894; 95% CI 3.171–11.508), bleeding (P < 0.001; OR = 37.733; 95% CI 4.467–4942.21), fluid collection (P = 0.009; OR = 3.448; 95% CI 1.335–9.893), delayed gastric emptying (P = 0.002; OR = 5.453; 95% CI 1.770–21.825), wound problem (P < 0.001; OR = 5.589; 95% CI 1.996–18.951) were risk factors of late discharge over 14 days. High grade pancreatic fistula was risk factor of readmission within 2 months after discharge.

Conclusion: ERAS after PD enables to shorten hospital stay and decrease wound problem without compromising outcomes.

Keywords: ERAS, Pancreatectomy, Complications.
**Total Pancreatectomy: Short- and Long-Term Outcomes at a High-Volume Pancreas Center**

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**Background:** Enthusiasm for total pancreatectomy (TP) has varied with time. It is still a topic of controversial discussions even since surgeons realized its feasibility.

**Aim:** To identify the current indications and outcomes of TP at a high-volume center.

**Methods:** A single institutional retrospective study of patients undergoing total pancreatectomy from 1995 to 2014 was performed.

**Results:** One hundred three patients underwent total pancreatectomy for indications including: pancreatic ductal adenocarcinoma (n = 42, 40.8%), intraductal papillary mucinous neoplasms (n = 40, 38.8%), chronic pancreatitis (n = 8, 7.8%), pancreatic neuroendocrine tumors (n = 7, 6.8%), and miscellaneous (n = 6, 5.8%). The mean age was 66.2 years, and 59 (57.3%) were female. Twenty-four patients (23.3%) underwent a laparoscopic total pancreatectomy. Splenic preservation and portal vein resection and reconstruction were performed in 24 (23.3%) and 18 patients (17.5%), respectively. The 90 days major complications, readmission, and mortality rates were 32%, 17.5%, and 6.8% respectively. The 1-, 3-, 5-, and 7-year survival for patients with benign indications were 84%, 82%, 79.5%, and 75.9%, and for malignant indications were 64%, 40.4%, 34.7%, and 30.9%, respectively.

**Conclusion:** Total pancreatectomy, including laparoscopic total pancreatectomy, appears to be an appropriate option for selected patients when treated at a high-volume pancreatic center and through a multispecialty approach.

**Keywords:** Laparoscopic total pancreatectomy, Pancreatic ductal adenocarcinoma, Intraductal papillary mucinous neoplasms, Laparoscopy, Pancreas cancer, Pancreas cyst.

**Portal and Mesenteric Vein Reconstruction after Pancreaticoduodenectomy and Total Pancreatectomy: Short- and Long-Term Outcomes at a High-Volume Pancreas Center**

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**Background:** Portal vein (PV) invasion by a malignant pancreatic mass is currently not a contraindication to pancreatic resection with acceptable oncologic outcomes. The aim of this study was to identify the perioperative morbidity and long-term outcomes of VR and reconstruction with pancreaticoduodenectomy (PD) and total pancreatectomy (TP) operations.

**Methods:** We conducted a retrospective study of patients undergoing PD or TP between March 1995 to December 2014 at Mayo Clinic in Florida (MCF) using data collected from an institutional review board approved prospective database. Preoperative, operative, and postoperative clinicopathological data were collected and analyzed.

**Results:** Out of 601 patients who underwent PD and TP in this study, 104 (17.3%) underwent VR. The types of VR and reconstruction were: type I (lateral venorraphy) in 49 patients (47.1%), type II (patch graft) in 10 patients (9.6%), type III (primary anastomosis) in 27 patients (26%), type IV (interposition venous graft) in 16 patients (15.4%), Two patients (1.9%) had no portomesentric reconstruction. The 90-day major postoperative complications and mortality in patients with VR were 44.2% and 10.6%, respectively, versus 29.2% and 5.6%, respectively, in patients with standard resection. The 1-, 3-, 5-, and 7-year survival rates in VR with periampullary carcinoma (PAAC) were 55.1%, 27%, 21.9%, and 15.4%, respectively, while in patients with PAAC without VR the survival rates were 78.4%, 45.6%, 34.6%, and 30.9%, respectively (P < 0.01).

**Conclusion:** Venous resection and reconstruction with PD can be performed safely with acceptable perioperative morbidity and long-term survival rates to achieve complete removal of the tumor.

**Keywords:** Venous resection, Reconstruction, Portal vein, Pancreaticoduodenectomy.
**PP3-043**
**Influence of the Reconstruction Method on Delayed Gastric Emptying after Pylorus-Preserving Pancreaticoduodenectomy**

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**Background:** Delayed gastric emptying (DGE) is one of the common complications after pancreaticoduodenectomy. The aim of this study was to identify a preferable reconstruction method reducing the incidence of DGE after pylorus-preserving pancreaticoduodenectomy (PPPD).

**Methods:** Data on 80 patients, who underwent PPPD at our hospital, were collected retrospectively between 2007 and 2014. A Billroth I type reconstruction (B-I group) was performed until 2010, and a Billroth II type reconstruction (B-II group) was performed after 2010. Hand-sewn end-to-end duodenojejunostomy in a retrocolic position was constructed for the B-I group, whereas hand-sewn end-to-side duodenojejunostomy in an antecolic position was constructed for the B-II group. The DGE and postoperative pancreatic fistula (POPF) were compared between the two groups. DGE was evaluated according to the consensus definition of the International Study Group of Pancreatic Surgery (ISGPS).

**Results:** The incidence of DGE (ISGPS Grade B or C) in the B-II group was significantly lower than that in the B-I group (p < 0.0001). There was no effect of POPF (ISGPS Grade B or C) on the incidence of DGE in the both groups.

**Conclusions:** It is suggested that the incidence of DGE after PPPD can be decreased by using B-II rather than B-I reconstruction for duodenojejunostomy. Although previous study has reported that the incidence of POPF is significant risk factor for DGE after SSPPD, there is no significant difference after PPPD in our study.

**Keywords:** Pancreaticoduodenectomy, Delayed gastric emptying, Reconstruction method.

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**PP3-044**
**Enhanced Recovery after Pancreatic Surgery: A Systematic Review**

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**Background:** Enhanced recovery after surgery (ERAS) program is widely used because it would reduce length of hospital stay (LOS) and morbidity. It has been used in colonic surgery, gastric cancer surgery and liver surgery. But in pancreatic surgery, the efficacy of ERAS program remains controversial. This study aimed to gain a current, comprehensive picture of how ERAS program compares with conventional care in patients undergoing pancreatic surgery.

**Methods:** MEDLINE, EMBASE, the Cochrane Library, and the Chinese National Knowledge Infrastructure database were searched through October 2015. Risk ratios (RRs), standard mean difference (SMD) and 95% confidence intervals (CIs) were calculated.

**Results:** The analysis included 16 studies (5 were with single cohort, and another 11 were with 2 groups). Patients in ERAS group had significantly lower mortality (RR = 0.77, 95% CI 0.70 to 0.84) and shorter LOS (SWD = −0.61, 95% CI −0.94 to −0.26). Moreover, ERAS program would not increase mortality rates (RR = 0.90, 95% CI 0.49 to 1.64) and readmission rates (RR = 0.92, 95% CI 0.71 to 1.18). Nevertheless, ERAS programs also help to reduce pancreatic fistula (RR = 0.77, 95% CI 0.70 to 0.84) and digestive gastric empty rates (RR = 0.66, 95% CI 0.53 to 0.83).

**Conclusion:** ERAS program is safe and efficient for patients undergoing pancreatic surgery.

**Keywords:** Pancreatic surgery, Enhanced recovery after surgery, Meta-analysis, Morbidity, Mortality.

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**PP3-045**
**Preoperative SPan-1 Value Predicts Postoperative Liver Metastasis in Pancreatic Cancer**

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**Background/Aims:** Pancreatic cancer is a malignant disease with a poor prognosis. It often metastasizes to the liver shortly after the complete resection of the primary site. The clarification of predictive factors related liver metastasis is extremely important to avoid unnecessary surgery for pancreatic cancer. We examined cases of pancreatic cancer that underwent curative resection to investigate factors associated with liver metastasis.

**Methods:** Subjects comprised 182 cases of pancreatic cancer that underwent macroscopic curative resection at Hirosaki University Hospital between January 2001 and July 2014. We investigated predictive factors for liver metastasis based on preoperative, intraoperative and postoperative clinical tumor factors.

**Results:** Of the 182 cases of pancreatic cancer in this study, 51 developed liver metastasis (liver metastasis group) and 131 did not exhibit liver metastasis or were non-recurrent (non-liver metastasis group). Univariate analysis of liver metastatic predictive factors in both groups indicated that portal vein invasion (PV+), invasion of other organs (OO+), maximum tumor diameter of ≥35 mm, preoperative SPan-1 value of ≥73 U/ml and postoperative DUPAN-2 value of 75 U/ml correlated with liver metastasis. Multivariate analysis clarified that preoperative SPan-1 value was an independent risk factor of liver metastasis (Hazard ratio, 7.41; 95% CI, 1.12–49.0; p = 0.038).

**Conclusion:** Preoperative SPan-1 value predicts postoperative liver metastasis in pancreatic cancer.
Conclusions: The rate of liver metastasis after the curative resection for pancreatic cancer strongly correlated with preoperative SPan-1 value (cut-off point, 73 U/ml). Preoperative SPan-1 value could be used to predict postoperative liver metastasis.

Keywords: Pancreatic cancer, Liver metastasis, SPan-1.

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PP3-046
A Study of Conversion Surgery for Locally Advanced Unresectable Pancreatic Cancer
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Aim: The aim of the present study was to estimate the survival benefit and safety of conversion surgery in patients with initially unresectable pancreatic cancer.

Methods: During 2010 to 2015, thirty-eight patients with unresectable pancreatic cancer were treated in our institute. Eleven patients were received conversion surgeries. Clinicopathologic factors and survival were investigated.

Result: Ten patients were consisted of seven males and three female. The median age was 66 (52–75). Locations of tumors were as follows: Head, 4 pts; Body, 4 pts; Head-body, 1 pt; Body-tail, 2 pt. The factors to be unresectable were as follows: invasion to the SMA, 2 pts; invasion to the common hepatic artery, 6 pts; invasion to the celiac artery, 2 pts; distant metastasis, 1 pt. All patients had chemotherapies as the preoperative treatment. GEM/S-1 (GS) and GEM/ nab-paclitaxel (GnP) were administered to nine patients and two patients, respectively. With regard to operative procedures, distal pancreatectomy with celiac artery resection were performed for three patients, distal pancreatectomy and splenectomy were for 3 pts, pancreaticoduodenectomy was for 3 pts, and total pancreatectomy was for 2 pts. R0 resections were performed in 9 patients, and there were no R2 operations. There were no severe postoperative complications exceeding Clavien-Dindo IIIB. The median survival time and three year survival rate were 21.1 months and 51.7%, respectively. On the other hand, the median survival time for 27 patients who could not have conversion surgeries was 9.5 months. There were significant differences between them (p = 0.021).

Conclusion: It was confirmed that conversion surgery after chemotherapy could elongate the survival time for initially unresectable pancreatic cancer patients. This treatment could be one of the promising strategies to improve the prognosis of pancreatic cancer.

Keywords: Conversion surgery pancreatic cancer.

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PP3-047
Novel HDAC Inhibitor, CG200745 Inhibits Pancreatic Cancer Cell Growth and Overcome Gemcitabine Resistance
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Background: Pancreatic cancer remains one of the most lethal cancers. Gemcitabine is currently the leading therapeutic agent for pancreatic cancer, despite growing resistance. Therefore, discovery of novel agents that increase the tumor sensitivity to gemcitabine is desirable. Histone deacetylase (HDAC) inhibitors are emerging as therapeutic agents for pancreatic cancer because HDAC plays an important role in cancer initiation and progression. We evaluated the antitumor effect of recently synthesized novel HDAC inhibitor, CG200745 combined with gemcitabine/erlotinib for pancreatic cancer cells and gemcitabine-resistant pancreatic cancer cells.

Methods: Pancreatic cancer cell lines including BxPC-3, CF-PAC-1, and HPAC were used to show the antitumor effect of CG200745 combined with gemcitabine/erlotinib. Cell viability after 72 hr incubation was detected by MTT assay to evaluate antiproliferative effect. Signal pathway was studied by western blot and FACS analysis. In vivo, the tumor volume and weight were checked according to combination of gemcitabine, erlotinib, and CG200745 in BxPC-3 nude mouse model. Next, CG200745 combined with gemcitabine/erlotinib was evaluated by MTT assay and western blot in gemcitabine-resistant pancreatic cancer cell lines.

Results: CG200745 yielded the expression of apoptotic proteins (PARP and caspase-3) and increased the levels of acetylated histone H3. CG200745 combined with gemcitabine/erlotinib treatment showed the significant growth inhibition and their synergistic antitumor effects in vitro. In vivo, gemcitabine/erlotinib and CG200745 combination reduced the tumor size up to 50% in BxPC-3 nude mouse model. CG200745 enhanced the sensitivity of cancer cell to gemcitabine in the gemcitabine-resistant pancreatic cancer cell lines. CG200745 treatment decreased the level of ATP-binding cassette transporter genes, especially multidrug resistance protein 3 (MRP3) and MRP4 related with drug resistance.

Conclusions: This study shows that novel HDAC inhibitor, CG200745 has a synergistic anti-tumor effect when added to gemcitabine/erlotinib for pancreatic cancer cell. Especially, CG200745 significantly improves the sensitivity of pancreatic cancer to gemcitabine.
**PP3-048**

**Neuroendocrine Carcinoma of the Pancreas: A Retrospective Single-Center Analysis of 42 Surgical Patients**

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**Background:** Pancreatic neuroendocrine carcinoma (PNEC) represents a rare group of pancreatic cancer, with limited data concerning biology, survival and the effect of treatment. The aim of this study was to assess the clinical and pathological features of surgical patients with PNEC to identify long-term outcome.

**Methods:** The clinical and pathologic data of 42 surgical patients with PNEC between January 2010 and October 2014 were retrospectively reviewed. Statistical analysis was performed to determine overall survival and recurrence-free survival of NEC postoperatively.

**Results:** Forty-two patients (23 men, 19 women) underwent pancreatic operations with curative intent. Complete resection was achieved in all the cases, with 50% of patients insulinoma. The pathological results of staining for synaptophysin, chromogranin-A, AE1/AE3, CD56, and neuronal specific enolase were positive in 57%, 50%, 26%, 17%, and 7%, respectively. Metastases were found in 25 patients (59%). No perioperative mortality occurred. 9 patients (21%) had recurrence. Overall survival and recurrence-free survival were 78% and 71%, respectively, after 4 years. Distal metastasis status (M1, p < 0.05) and simultaneous expression of synaptophysin, PS3 and chromogranin-A (p < 0.05) were associated with poorer outcome.

**Conclusions:** PNEC is a rare neuroendocrine pancreatic malignancy that is associated with poor prognosis. Surgical treatment can achieve satisfactory results in selected cases. Further neuroendocrine markers could be explored to predict prognosis.

**Keywords:** Ursodeoxycholic acid (UDCA), EMT, ROS.

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**PP3-049**

**Ursodeoxycholic Acid (UDCA) Suppressed EMT and Formation of Cancer Stem Cell in Pancreas**

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**Introduction:** Regulation of reactive oxygen species (ROS) is one of the key targets on cancer treatments. Ursodeoxycholic acid (UDCA) could play a role of antioxidant effects and previous reports revealed that suppress the proliferation of colon cancer cell. Therefore, we aim to evaluate the anticancer effect of UDCA in pancreas.

**Method:** Pancreatic cancer cell lines (HPAC and Capan-1) were treated with 0.2 mM UDCA. To determine alternated level of intracellular ROS, we detected DCF-DA stained cells. We used cell counter to check number of total cells. We check level of stemness gene and epithelial mesenchymal transition (EMT) related genes using qRT-PCR and western blotting. A number of total cell calculated using automatic cell counter. Tumor sphere were counter after 7 days with or without 0.2 mM UDCA.

**Results:** UDCA reduced a number of total HPAC and Capan-1 cells, however did not strikingly increase number of dead cells. After the treatment of UDCA in these cells, intracellular ROS was decreased, and mRNA expression of both CD24 and Sox2 were reduced. In addition, the expression of E-cadherin was increased however N-cadherin was decreased. In terms of UDCA effects of cancer stem cell, pancreas cancer sphere formation was decreased.

**Conclusion:** Our results show that UDCA suppressed level of intracellular ROS, stemness, and EMT marker. Therefore, UDCA might provide good therapeutic benefit by reducing number of cancer and cancer stem cell.

**Keywords:** Ursodeoxycholic acid (UDCA), EMT, ROS.

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**PP3-050**

**To Perform Chemotherapy or Not, That Is a Question in Elderly Patients with Pancreatic Cancer**

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**Background/Aims:** Pancreatic cancer is a disease seen predominantly in elderly patients. Chemotherapy, which is one of the standard treatments for locally advanced and metastatic pancreatic cancer, is considered a high risk therapeutic modality in elderly patients. This study investigated the outcome and tolerability of chemotherapy in elderly patients with pancreatic cancer.

**Methods:** Between January 2010 to January 2016, 226 patients was diagnosed with pancreatic cancer. Among them, patients with over 70 years old were reviewed retrospectively and clinical parameters, survival rate from initial chemotherapy (CTx), adverse events during chemotherapy were analyzed.

**Results:** Among 226 patients, 84 patients (34.7%) were more than 70 years of age and gemcitabine based chemotherapy was performed in 57 patients (CTx. Group) and 27 patients were not received chemotherapy (non-CTx. Group). The overall survival of total elderly patients was 8.2 months and the survival of each group was 10.3 months in CTx. Group and 3.7 months in non-CTx. Group (p = 0.042). The incidence of adverse events such as bone marrow suppression (neutropenia, thrombocytopenia and anemia) was not different between younger patients (<70 years) and older patients. The independent negative prognostic factors associated with survival were lower Karnofsky performance status (≥80) and distant metastasis.

**Conclusions:** The survival benefit can be achieved through gemcitabine based chemotherapy in elderly patients without frequent adverse event. Karnofsky performance status and distant metastasis are independent prognostic factors.

**Keywords:** Pancreatic cancer, Old age, Chemotherapy.
## PP3-051

**Analysis of the Patients with Tis and T1-Invasive Ductal Pancreatic Cancer in Our Institute**

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**Background and Aim:** The patients with pancreatic cancer (PC) are often diagnosed as advanced disease because PC develops without any symptoms. Even for the patients with T1 stage who underwent radical surgery, some patients often have early recurrence. The aim of this study was to evaluate predictors of poor prognosis for the patients with Tis and T1 PC.

**Methods:** A total of 146 patients with PC underwent radical surgery at Hirosaki University Hospital between 2004 and 2012. We investigated the clinicopathological features of 10 patients who were diagnosed with Tis and T1 PC after operation, retrospectively.

**Results:** Overall survival rates and disease-free survival at 5 years were 60.0 and 48.0%. In univariate analysis, high preoperative CA19-9 level (P = 0.036) and lymph node metastasis (P = 0.003) were found to be prognostic factors for recurrence. CA19-9 was the only prognostic factor for survival (P = 0.013).

**Conclusion:** An elevated CA19-9 level is likely to be a predictor of poor survival for early PC although this study was performed retrospectively, and included a small number of patients. More effective systematic adjuvant chemotherapy for oncological control of high CA19-9 cases can be required to improve future outcomes.

## PP3-052

**Total Pancreatectomy for Metachronous Multiple Pancreatic Metastasis from Renal Cell Carcinoma: Report of 2 Cases**

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**Background:**Renal cell carcinoma (RCC) is easy to metastasize for the lung, liver, and bone, rare to pancreas. However, many case reports of resectable pancreas metastasis are able to be confirmed, because of improvements in diagnostic imaging recently. According to the Kidney cancer clinical practice guidelines, if performance status (PS) is good and metasteses are resectable, we can be expected with long-term survival by surgical resection. There is no evidence of strategy for surgical procedure for pancreatic metastasis whether partial resection or total pancreatectomy (TP). We report two cases of TP for metachronous multiple pancreatic metastasis from RCC.

**Case1:** The patient is a 73-year-old woman who had undergone left nephrectomy for RCC. 7 years after surgery, abdominal enhanced computed tomography revealed well-contrasted, multiple hypervascular mass in pancreas. We diagnosed the patient with metachronous pancreatic metastasis of RCC and performed a TP. After surgery, no recurrence and distant metastasis are seen for 4 years.

**Conclusion:** The indication of TP must be decided carefully. Generally, the TP becomes the selectable surgical procedure, by well discussed patient’s PS and background characteristics. TP can be considered a one of treatment option for multiple pancreatic metastasis from RCC.

## PP3-053

**Prognostic Value of a microRNA Signature Based Nomogram in Pancreatic Cancer**

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**Objective:** MicroRNAs (miRNAs) can be used as prognostic biomarkers in many types of cancer. We aimed to construct and evaluate a nomogram based on miRNA signatures in combination with clinicopathological characters for predicting the prognosis of pancreatic cancer patients receiving radical surgery.

**Methods:** We retrospectively analysed miRNA expression profiles in 40 frozen preserved specimens of pancreatic cancer and paired para-tumor tissues from Guangdong General Hospital (Guangzhou, China) by using a microarray chip. We confirmed the miRNAs levels using quantitative RT-PCR in a set of 106 samples (training set), and then selected prognosis-associated miRNAs and derived a formula to calculate the risk score for every patient from the expression values of the selected miRNAs, weighted by regression coefficient. In addition, the association between clinicopathological characters and prognosis was evaluated by multivariate logistic regression. The microRNA risk score and prognosis associated clinicopathological factors were used to construct the nomogram.

**Results:** miRNA microarray profiling showed 41 downregulated microRNAs and 29 upregulated microRNAs which changed more than 2-fold. Kaplan survival curve identified 7 microRNAs (miR130b, miR-604, miR-216a, miR-217, miR-645, miR-658, miR-219-2-3p) that were correlated with survival. We derived a formula to calculate the risk score for every patient from the expression values of the 7 miRNAs, weighted by regression coefficient. At last, Age, C-reactive protein, tumor size, lymph node positive rate, differentiation, perineural invasion, in combination with microRNA risk score were identified to construct the nomogram.

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Abstracts
The nomogram predicting the overall survival showed relative good concordance index (0.799) and good calibration.

**Conclusion:** Establish of the nomogram might add prognostic value to the TNM staging system and inform treatment decisions for patients at high risk of progression.

**Keywords:** Pancreatic cancer, microRNA, Nomogram, Prognostic marker.

### PP3-054
**Mortality Risk Factor Analysis in Colonic Perforation: Would Retroperitoneal Contamination Increase Mortality in Colonic Perforation?**

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**Purpose:** Colonic perforation is a lethal condition presenting high morbidity and mortality in spite of emergent surgical treatment. This study investigated the surgical outcome of patients with colonic perforation associated with retroperitoneal contamination, evaluating the effect of retroperitoneal contamination in postoperative mortality.

**Methods:** Retrospective analysis was performed for 30 patients diagnosed with colonic perforation caused by either inflammation or ischemia who underwent emergent surgical treatment in our facility from January 2005 to December 2014. Patient characteristics were analyzed to find risk factors correlated with increased postoperative mortality. Using the Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity (POSSUM) audit system, the mortality and morbidity rates were estimated to verify the surgical outcomes. Patients with retroperitoneal contamination, defined by the presence of retroperitoneal air in the preoperative abdominopelvic computed tomography, were compared to those without retroperitoneal contamination.

**Results:** Eight (26.7%) out of 30 patients with colonic perforation had died after emergent surgical treatment. Factors associated with mortality included age, American Society of Anesthesiologists (ASA) class, and the ischemic cause of colonic perforation. Three (50%) out of six patients who presented retroperitoneal contamination were deceased. Although the patients with retroperitoneal contamination didn’t show significant increase in the mortality rate, they showed significantly higher ASA class than those without retroperitoneal contamination. The mortality rate predicted from P-POSSUM was higher in the patients with retroperitoneal contamination.

**Conclusions:** Patients presenting colonic perforation along with retroperitoneal contamination demonstrated severe comorbidity. However, retroperitoneal contamination was not found to be correlated with the mortality rate.

**Keywords:** Retroperitoneum, Colonic perforation, Sepsis, Mortality, POSSUM.

### PP3-055
**Management of Colonic Diverticulits**

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**Background:** Colonic diverticulitis once considered the disease of the west is often encountered in Indian population. Algorithm in management is still evolving and dilemma in management exist in choosing the right surgical candidate and choice of procedure.

**Methods:** Retrospective review of prospectively collected data of patients admitted with diverticulitis in our institute Feb. 2010 to Jan. 2015.

**Results:** 34 of the 47 patients required surgical intervention with median age of 59 years. Out of 34 patient, there were 8 who underwent primary procedure outside and referred. Most common indication of surgery was colovesical fistula followed by diverticular abscesses and peritonitis. Primary anastomosis (sigmoidectomy) and diversion ileostomy was the most favoured approach. Hand assisted Laparoscopy was attempted in 15 patients and required conversion in only one. Overall stoma reversal rate was 85% with two mortality.

**Conclusion:** Complicated Diverticulitis may pose dilemma in management. Chances of failure with PCD in Colonic diverticulitis with large, multiple abscesses and pelvic abscess. Primary anastomosis with ileostomy is preferred. Low threshold for surgery – autoimmune patients. Hand assisted laparoscopy is feasible and safe.

**Keywords:** Colonic diverticulitis, Laparoscopy for diverticulitis.

### PP3-056
**Spastic Pelvic Floor Syndrome: Efficacy of Biofeedback Training and Predictors of Success**

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**Background/Aim:** Failure to relax or paradoxical contraction of the pelvic floor during attempts to defecate is described pelvic floor syndrome which is one of the most common forms of functional constipation. It is a behavioral disorder. Consequently, biofeedback training has been recommended as a behavioral therapy for such disorder. The aim of the present study was to evaluate long-term satisfaction of patients diagnosed with pelvic floor syndrome after biofeedback.

**Methods:** The study was done on 60 patients (35 females & 25 males) with a mean age of 35 years & a mean duration of constipation of 4 years. 45 patients were associated with normal colon transit & 15 patients with slow colonic transit. History, physical examination & barium enema was done to exclude constipation secondary to organic causes. A series of tests of colonic & pelvic floor functions were performed before & after biofeedback treatment: Colon-transit time, Anorectal manometry & EMG & Defecography. Patients were treated on a weekly basis by an average of 6 ± 2 sessions.
**Results:** At the end of treatment, 55 of the 60 patients reported a subjectively overall improvement. Symptoms of dyschezia were reported less frequently after biofeedback. Age & gender were not a predictive factor of outcome. No symptom at initial assessment appeared predictive of patient satisfaction but the only factor of predictive value is proper diagnosis of anismus & the motivated patient who wants to continue the sessions, to cooperate & to spend time with us.

**Conclusion:** Clear-cut criteria & anorectal manometry help us to select patients likely to benefit from biofeedback in the long term without the costs & risk of other tests. Biofeedback remains a morbidity free, low-cost & effective outpatient therapy for well-motivated patients complaining of spasticity of the pelvic floor.

**Keywords:** Biofeedback, Spastic pelvic floor syndrome.

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**PP3-057**

**The Regulation of Oxidative Stress by Ursodeoxycholic Acid (UDCA) in Colon Cancer Cell and Colon Cancer Stem Like Cell**

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**Introduction:** Regulation of reactive oxygen species (ROS) is one of the key targets of cancer treatments. In some study, ursodeoxycholic acid (UDCA) can suppress the proliferation of colon cancer cell. The aim of the study was to evaluate the effect of UDCA on proliferation and ROS of colon cancer cell.

**Method:** Colon cancer cell lines (HT-29 and HCT-116) were treated with UDCA. Number of total and dead cell checked using cell counter. We preformed DCF-DA staining to detect alteration of intracellular ROS using FACS. Exposure to UDCA, level of p27, p18, CDK2, CDK4 and CDK6 was used Western blotting for protein state and qRT-PCR for mRNA level. Colon cancer formed colony stem like cell in ultra low attachment plates (~7 day) with or without 0.2 mM UDCA. Number of sphere cells was counted by microscopy. Western blotting was show protein levels of cell cycle regulators. These mRNA level was measured by qRT-PCR method. Analysis of cell cycle was used by FITC-BrdU Flow kit.

**Results:** We found that UDCA reduced number of total colon cancer cell but did not increase number of dead cell. UDCA was found to regulate intracellular ROS generation in colon cancer. UDCA induced expression of cell cycle inhibitors, such as p27, p21, p18. But UDCA suppressed the level of CDK2, CDK4 and CDK6. UDCA inhibited transition G1/S and G2/M phase in colon cancer. UDCA suppressed expression of CDK2, CDK4 and CDK6. And then, UDCA arrest cell cycle in cancer stem like cell. UDCA reduced number of sphere formation.

**Conclusion:** Our results indicate that UDCA suppressed proliferation through regulation of oxidative stress in colon cancer cells and cancer stem like cells.

**Keywords:** Colon cancer, Ursodeoxycholic acid (UDCA), Reactive oxygen species (ROS).

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**PP3-058**

**The Role of Monofloxacin As Prophylactic Antibiotics in Colorectal Surgery**

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**Background:** Colorectal procedures has high chance for surgical site infection (SSI). The risk of SSI in colorectal operation is associated with patient factors and peri-operative factors. Prophylactic antibiotics are one of the method for prevention of SSI. But, type of antibiotics are differ from hospitals. We use moxifloxacin as prophylactic antibiotics for several years, but not estimated with its effect on SSI.

**Methods:** The study group comprised 7365 patients (4547 male and 2808 female; mean age 62 years) who underwent primary resection for colorectal cancer in Seoul National University College of Medicine from June 2005 through December 2014. Exclusion criteria were emergency operation and debulking operation. Two groups are divided by duration of antibiotics. Patients from June 2005 to April 2007 are cephalosporin with metronidazole group and Patients from May 2007 to December 2014 are moxifloxacin group. Sex, age, BMI, ASA class, comorbidity disease, smoking, drinking, laparoscopic surgery are compared with two groups.

**Results:** SSI occurred in 74 (1.0%) of the 7365 patients. There was no significant difference in demographics between two groups. BMI was 26.3 in cephalosporin group but 23.5 in moxifloxacin group. Laparoscopic surgery are 47 cases in cephalosporin group and 2808 patients were diagnosed with SSI after laparoscopic surgery in moxifloxacin group (23.0%) with no significant difference (p = 0.195). Reoperation rate was higher in moxifloxacin group (18, 1.7% vs. 212, 3.34%, p = 0.023). There was no SSI related death. As subgroup analysis by type of SSI, the rate of superficial SSI was 47.3% (35/74), the rate of deep infection was 12.1% (9/74), and the rate of organ spaced was 40.6% (30/74). Organ-spaced SSI is higher in cephalosporin group than moxifloxacin group (55.6% vs. 33.3%) and superficial infection is lower in cephalosporin group (11.1% vs. 56.7%, p = 0.023).

**Conclusion:** To prevent SSI after surgery for colorectal cancer, moxifloxacin is useful for prophylactic antibiotics. Further study with oral antibiotics and multivariate analysis will be needed.

**Keywords:** SSI, Colorectal cancer, Monofloxacin.
PP3-059
Evaluation of Compromising Factors for Postoperative Recovery of Total Protein and Hemoglobin Level after Colorectal Cancer Surgery
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Purpose: To investigate factors that compromise postoperative recovery of total protein (TP) and hemoglobin (Hb) level after colorectal cancer surgery.

Methods: We evaluated TP and Hb level during the first postoperative year among 185 patients who underwent colorectal cancer resection. Data was collected at the time of admission, postoperative day (POD) 1, 4, and 7, as well as 1, 3, 6, and 12 month after surgery. We analyzed effects of patient age over 80, presence of malignant bowel obstruction (MBO), distant metastasis, malnutrition, open surgery, postoperative complications graded as Clavien-Dindo classification (CDC) IIIa or more, and adjuvant chemotherapy on TP and Hb level.

Results: Patients aged over 80 showed lower TP and Hb level compared to patients aged under 80 during the first postoperative year by 4% and 8% on average (p < 0.05). Presence of MBO, malnutrition, or distant metastasis resulted in lower TP level compared to patients without those conditions from admission to POD 7 (p < 0.05). TP level in patients with MBO and malnutrition was restored at 1 and 3 month after surgery, respectively. However, TP level of patients with distant metastasis was impaired by 6% on average throughout a year (p < 0.05). MBO, distant metastasis, and malnutrition also caused significant decrease in postoperative Hb level for 12, 12, and 6 months after surgery, respectively. Patients who underwent open surgery demonstrated lower TP and Hb level than patients who had laparoscopic surgery even at the time of admission (p < 0.05). Presence of postoperative complications graded as CDC IIIa or more did not affect TP and Hb level. Patients who received adjuvant therapy showed 5% lower TP and Hb level than patients without adjuvant therapy at 6 months after surgery (p < 0.05).

Conclusions: Patients with compromising factors for postoperative recovery of TP and Hb level require early medical and nutrition support.

Keywords: Colorectal cancer, Total protein, Hemoglobin, Postoperative recovery.

PP3-060
Tumour-Derived Laminin Supports the Growth of Hepatic Metastasis through the Promotion of Angiogenesis
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Introduction: Extracellular matrix (ECM) proteins provide a scaffold for developing vessels and guide angiogenesis. Laminin chains α4, α5, β1 and γ1 are found at high levels in the vascular basement membrane. The growth of hepatic metastasis is highly dependent upon angiogenesis. We questioned whether tumour cells promote angiogenesis through laminin production in the hepatic metastatic microenvironment.

Methods: Intrasplenic injection of human or murine colon cancer cell lines to SCID or C57Bl6 mice respectively was performed. RNA from the resultant liver metastases were analysed by gene array using human or murine-specific primers. Antibody-mediated depletion of neutrophils was performed in mice. shRNA was utilized to inhibit laminin α5 production in colon cancer cell lines. Human resection specimens were analysed to support animal models.

Results: Liver metastasis xenografts and human resection specimens expressed human laminin α4, α5, β1 and γ1 RNA and protein, indicating that tumour cells produce the laminin subtypes required for vascular basement membrane assembly. Immunohistochemically, hepatic metastasis xenografts demonstrated high levels of laminin α5, β1 and γ1 proteins. These proteins ensheathed tumour vasculature in both human and xenograft specimens indicating their incorporation into the vascular basement membrane. Metastases developed in mice deficient in neutrophils demonstrated reduced laminin α5 protein expression and conditioned media from metastasis-derived immune cells promoted laminin α5 expression by colon cancer cells in-vitro. Macrophage-conditioned medium was enriched with TNFα and treatment of human colon cancer cells with TNFα promoted LAMA5 protein expression in an NFκB-dependent manner. Inhibition of tumour-derived laminin α5 resulted in a significant delay in the growth of hepatic metastases and a deficiency of tumour vasculature.

Conclusion: This work identifies a novel mechanism through which immune cells regulate angiogenesis by stimulation of the expression of laminin α5 in tumour cells via the TNFα/NFκB pathway. Laminin α5 may represent a target for inhibition of tumour angiogenesis.

Keywords: Liver, Metastases, Colon, Cancer, Angiogenesis, Extracellular matrix.
PP3-061
Impact of Early Postoperative Chemotherapy in Rectal Cancer
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Introduction: Postoperative chemotherapy (POCT) for colorectal cancer has been established as a current standard of treatment but there is no guideline for the timing to initiate POCT. The aim of this study is to identify the timing to initiate POCT and investigate its impact on oncologic outcome in rectal cancer.

Patients and Methods: A total of 997 patients who underwent curative resection and received POCT for rectal cancer were enrolled. Patients’ medical records including survival data were analyzed retrospectively. Distributing the data by the calculated cut-off point for the initiation time of POCT, survival results and POCT induced toxicity were compared. Dividing the patients into two groups whether underwent preoperative chemoradiotherapy (CRT), comparison of survival was performed.

Results: For the total 997 patients, mean interval time for the initiation of POCT was 29.1 days and calculated cut-off point was 20th day after surgery. Comparing disease free survival (DFS), patients received POCT after 20th day showed worse result than within 20th day. Analyzing the toxic effect of POCT between these two groups, there was no significant difference. For the 719 patients who did not receive preoperative CRT, mean interval time for the initiation of POCT and calculated cut-off point was 27.6 days and 19th day, respectively. Comparing DFS, patients received POCT after 19th day showed worse result. For the 258 patients who received preoperative CRT, mean interval time for the initiation of POCT and calculated cut-off point was 33.4 days and 56th day, respectively. However, its oncologic impact was unclear.

Conclusion: Earlier initiation of POCT within approximately 3 weeks after surgery in rectal cancer was associated with better oncologic outcome and patients’ compliance. In the patients who received preoperative CRT, optimal initiation time to POCT was unclear, which requires further study.

PP3-062
Impact of Anastomotic Leakage and Related Factors on Long-Term Oncologic Outcome after Low Anterior Resection for Rectal Cancer
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Introduction: Anastomotic leakage (AL) is well-known cause of morbidity after low anterior resection (LAR) for rectal cancer. But, the impact on oncologic outcome is still debatable because the oncologic result in each individual with AL is unpredictable. The aim of present study is to investigate whether AL have impact on long-term oncologic outcome and searching for the AL related factors that can be associated with the prognosis after LAR for rectal cancer.

Patients and Methods: A total of 1258 patients who underwent curative resection for rectal cancer without diverting stoma were enrolled and their medical records were analyzed retrospectively. To investigate AL related factors that can be associated with oncologic outcome, C1avien-Dindo grade, prognostic nutritional index (PNI) and inflammatory indices such as leukocyte count, proportion of neutrophil in total leukocyte at that point of diagnosis of AL were included in the analysis.

Results: Comparing disease-free survival (DFS), patients with AL showed inferior result than patients without AL. On the multivariate analysis, AL was found to be significantly related to poorer outcome with the other factors such as elevated preoperative carcinoembryonic antigen level, advanced TNM stage and presence of lymphovascular invasion. In the subgroup analysis of the patients with AL, age over 60, advanced TNM stage, absence of increased proportion of neutrophil in total leukocyte above normal range (≤80%) and PNI less than 36 were associated with the poor DFS.

Conclusion: AL was associated with poor oncologic outcomes, especially in DFS. In the case of AL, not only the known poor prognostic factors such as age over 60 and advanced TNM stage but also absence of high neutrophil proportion above normal range and decreased PNI under 36 that might be related to patients’ immunity were associated with tumor recurrence.

PP3-063
Prognostic Impact of Staging Migration According to Insufficient Lymph Node Retrieval in Patient with Rectal Cancer
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Purpose: In rectal cancer, opinions on the optimal number of harvested lymph nodes (LNs) currently differ between researchers and their implication varies according to different treatment settings.

Methods: The data of all patients with biopsy proven rectal adenocarcinoma who underwent curative surgery between Jan 2005 and Dec 2012 were analysed. Univariate and multivariate analyses for oncologic outcomes were performed in LN+ or LN− group. Subgroup analyses were performed according to whether a patient had received preoperative chemoradiotherapy (pCRT).

Results: A total of 1825 patients were enrolled into the study. The maximal chi-square method revealed the minimum number of harvested lymph nodes required to be 12. Univariate and multivariate analyses found LNs ≥12 to be an independent prognostic factor for both overall survival (OS) (hazard ratio [HR] = 0.5, 95% confidence intervals [CI]: 0.3–0.8; p = 0.002) and disease free survival (DFS) (HR = 0.6, 95% CI: 0.4–0.7; p < 0.001) in the LN− group. In the LN− group, LNs ≥12 continued to be a significant prognostic factor both for OS and DFS in the subgroup of patients who did not undergo pCRT. However, in the subgroup of the LN+ patients who underwent pCRT, LN ≥8 was significant for DFS and OS.
Abstracts

**PP3-064**

**Surgical Technique and Treatment Outcome for Laparoscopic Lateral Lymph Node Dissection in Cases of Lower Rectal Cancer**

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**Purpose:** In our medical department the standard surgical treatment for lower rectal cancer is total mesorectal excision (TME) + bilateral lateral lymph node dissection (LLND). We previously demonstrated the effectiveness of LLND preserving autonomic nerve using an extraperitoneal approach, but recently we have adopted a laparoscopic TME + bilateral LLND surgical technique designed to achieve more precise nerve preservation. Here we present the treatment outcomes for LLND performed at our medical department using each approach. We also describe our actual surgical techniques and indicate aspects of the dissection that require particular caution.

**Subjects and Methods:** The subjects were 392 patients who underwent LLND using the extraperitoneal approach (Group O) and 16 subjects who underwent LLND using the laparoscopic approach (Group L), who were selected from a total of 844 subjects who underwent surgery for rectal cancer at our medical department between 1994 and 2015.

**Results:** The subjects were 280 men and 112 women. The mean age of the subjects was 64. The mean operative time was 205 minutes in Group O and 291 minutes in Group L. Mean blood loss was 628 g in Group O and 115 g in Group L (p < 0.01). The total number of lymph node dissections was 27 in Group O and 24 in Group L. Group L showed a tendency toward a larger number of #263 lymph node dissections. Postoperative complications of Clavien-Dindo grade II or above were observed in 45% of Group O cases and 18% of Group L cases (p < 0.01). Dysuria was observed in 13% of Group O, but although temporary dysuria was observed in three cases in Group L, all three of these cases improved.

**Conclusion:** Laparoscopic TME + bilateral LLND is extremely effective in preserving autonomic nerves. We plan to continue our study of this technique with additional cases.

**Keywords:** Lateral lymph node dissection.

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**PP3-065**

**Natural Morphological Change of Untreated Early Colorectal Cancer**

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The information for the natural course of untreated early colorectal cancer is rare. In this case report, we show that the natural morphological change of the early colon cancer to the advanced form which was not treated at the time of initial diagnosis.

A 66-year-old Korean man was admitted at this hospital on September 11, 2013 because of abdominal distension and general edema over 1 month, and 10-days history of melena. The level of hemoglobin and albumin were 5.4 g/dl and 6.3 gm/dl, respectively. Abdominal computed tomography revealed cirrhotic liver, splenomegaly, and large amount of the ascites. The upper endoscopic examination revealed esophageal varix (Grade II) and fundal varix. According to these results, the patient was diagnosed as alcoholic liver cirrhosis (Child-Pugh class C), and took colonoscopic examination for baseline study. Colonoscopic examination revealed an about 20 mm sized, round shaped, polyloid lesion at rectum. The histopathologic finding of the lesion was adenocarcinoma with well differentiated, coexisting with villotubular adenoma with low grade dysplasia. However, he was not treated, because he did not want to treat with the rectal cancer. He had followed-up at the outpatient clinic in this hospital, before new symptoms appear. He underwent the colonoscopic examination on May 14, 2015, and it revealed that an about 30 mm sized, ulcerative lesion with elevated distinct borders at rectum which was same location as the previous examination. At that time, the patient decided to receive treatment and he underwent concurrent chemotherapy and radiotherapy and subsequently laparoscopic low anterior resection. The histologic finding of adenocarcinoma with moderately differentiated, and the tumor invaded to proper muscle. After the operation, the patient has attended the outpatient clinic of this hospital and until now, the evidence of tumor recurrence has not been observed.

**Keywords:** Colorectal cancer, Natural history.

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**PP3-066**

**Postoperative Portomesenteric Venous Thrombosis after Colorectal Cancer Surgery: A Single Center Study from 5,081 Consecutive Patients**

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**Purpose:** Portomesenteric venous thrombosis (PVT) is a known complication after colorectal surgery. However, most of previous studies were based on patients with various diseases, mainly inflammatory bowel disease. Clinical characteristics and significance of PVT developed after surgery for colorectal cancer (CRC) is still unclear.

**Conclusion:** Retrieval of LNs ≥12 and LNs ≥8 should be achieved to obtain accurate staging and optimal treatment for the non pCRT and pCRT groups, respectively.
Postoperative PVT was developed in 9 (0.18%) patients. Eight patients were not related to liver disease, and one had alcoholic liver cirrhosis with Child-Pugh B class. PVT in seven patients was detected within postoperative 2 weeks (range 6 to 13 days) by CT for evaluating non-specific symptom such as mild fever or persistent leukocytosis, and two patient without symptom was detected by follow-up CT within 3 months after the primary CRC surgery. PVT with liver cirrhosis, which was detected in postoperative 13 day, involved main portal vein causing hyperbilirubinemia. Thrombectomy with thrombolysis was performed for this patient, which induced an intra-abdominal bleeding and varix bleeding within 30 days after thrombectomy. PVT in eight patients without liver disease was occurred by non-tumoral thromboemboli multifocally involving the right portal branches, which were resolved by anticoagulation therapy in four patients and conservative care in four patients without long-term complication.

Conclusions: Postoperative PVT developed after CRC surgery was very rare. Although it was a cause of considerable postoperative morbidity in a patient with liver cirrhosis, postoperative PVT in our patients was usually detected incidentally and manageable without serious complication.

Keywords: Portomesenteric venous thrombosis, Portal vein thrombosis, Colorectal cancer, Pylephlebitis.

PP3-067
Risk Factor Analysis on the Anastomotic Leakage after Curative Surgery in Rectal Cancer and the Impact of AL on the Mid-Term Oncologic Outcome

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Purpose: Anastomotic leakage (AL) is a lethal complication in rectal cancer patients undergoing curative resection, increasing short-term morbidity and mortality. There is growing evidence of that AL influences the oncologic outcome in rectal cancer. This study investigates the impact of AL on the oncologic outcome of patients undergoing curative resection of stage I to III rectal cancer.

Materials and Methods: A total of 271 patients who underwent curative resection of stage I-III rectal cancer from January 1st, 2005 to December 31st, 2015 and their specimen was examined with whole-mount section. The clinicopathologic variables were correlated with disease-free survival and overall survival.

Result: The clinicopathologic data of 202 patients were analyzed. The mean distal margin was 2.24 cm (0 to 8.0 cm) and mean lateral margin was 0.79 cm (0 to 3.5 cm). There were 1 patient (0.5%) with positive distal margin and 9 patients (4.5%) with positive lateral margin. At a mean follow-up of 47 months, 55 patient experienced local or distant recurrence and 38 patients died during follow-up. Comparing disease free survival among group divided by lateral margin, group with positive lateral margin and less than 1 mm showed significantly worse prognosis (p = 0.022). Patients with distal margin longer than 2 cm showed lower disease free survival (p = 0.002). Overall survival showed similar trend with disease free survival.

Conclusion: Generally known resection margin for rectal cancer surgery is based on conventional section. However, whole-mount section provides more precise information of resection margin. This study can suggest proper resection margin on the...
basis of evidence of precise resection margin with whole-mount section and long term follow-up data.

**Keywords:** Rectal cancer, Whole-mount section.

### PP3-069
**Which Is the Better Prognostic Factor in Rectal Cancer Patients Who Received Neoadjuvant Chemoradiotherapy: cTNM Stage vs. ypTNM Stage?**

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**Background/Aims:** Neoadjuvant chemoradiotherapy (nCRT) in rectal cancer is widely applied in patients with cTNM II and III stage. However, it is still obscure which staging system, either clinical (c) or pathologic (yp), influences in prognosis. This study aims to evaluate the current staging system predicting prognosis in the locally advanced rectal cancer patients.

**Methods:** Among 221 patients who were diagnosed with rectal cancer and underwent curative resection from January 2009 to February 2013, 141 patients who received nCRT were included. The ypTNM stage was categorized: complete remission and stage I to ypII.

**Result:** Mean follow-up period was 36.3 ± 15.1 months. Disease-free survival (DFS) was not associated with age, sex, Anesthesiologists classification, types of operative procedure, tumor cell differentiation, tumor location, tumor infiltration, preoperative CEA level, adjuvant chemotherapy. cTNM stage did not demonstrate any correlation with DFS (cII % vs. cIII %, P = 0.266). However, DFS did exhibit statistically significant association with postoperative CEA level (P < 0.001) and ypTNM stage. 3-year DFS rate for each categorized stage was as follows – ypI, 87.9%; ypII, 67.8%; ypIII, 53.3% (ypI vs. ypII P = 0.009, ypI vs. ypIII P < 0.001, ypII vs. ypIII P = 0.185).

**Conclusion:** Oncologic outcome of the patients with locally advanced rectal cancer is associated with pathologic TNM stage. Based on our results, we think that adjuvant chemotherapy given to patients with complete remission or pathologic stage I may be reconsidered.

**Keywords:** Neoadjuvant chemoradiotherapy, Clinical TNM stage, ypTNM stage.

### PP3-070
**Overexpression of TCN1 is an Independent Negative Prognosticator in Rectal Cancers Receiving Concurrent Chemoradiotherapy**

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**Background:** Neoadjuvant concurrent chemoradiotherapy (CCRT) is an increasingly common therapeutic strategy for locally advanced rectal cancer, but it remains a major challenge to predict therapeutic response and patient outcomes. Transcobalamin 1 (TCN1) involves regulation of the Wnt/beta-catenin pathway, resulting in cancer progression and outcome deterioration. It was reported to be a poor prognosticator in gastric cancers. However, little is known about the relevance of TCN1 to rectal cancer receiving CCRT. This study examined the predictive and prognostic impact of TCN1 expression in patients with rectal cancer following neoadjuvant CCRT.

**Methods:** Through data mining from a published transcriptome of rectal cancers (GSE35452), we identified upregulation of TCN1 as the most significantly predicted poor response to CCRT among iron transport-related genes (GO:0006826). We evaluated TCN1 immunohistochemistry and performed an H-score analysis on endoscopic biopsy specimens from 172 rectal cancer patients receiving neoadjuvant CCRT followed by curative surgery. Expression levels of TCN1 were further correlated with clinicopathological features, therapeutic response, tumor regression grade (TRG) and survivals including metastasis-free survival (MeFS), disease-specific survival (DSS) and recurrent-free survival (LRFS).

**Results:** TCN1 overexpression was significantly related to advanced post-treatment tumor (T3, T4; p < 0.001) and nodal status (N1, N2; p < 0.001) and nodal status (N1, N2; p < 0.001), vascular invasion (p = 0.003) and inferior tumor regression grade (p < 0.001). In survival analyses, TCN1 overexpression was significantly associated with shorter DSS (p < 0.0001), MeFS (p = 0.0002) and LRFS (p = 0.0001). Furthermore, it remained an independent prognosticator of worse DSS (p = 0.002, hazard ratio = 3.44), MeFS (p = 0.021, hazard ratio = 3.015) and LRFS (p = 0.037, hazard ratio = 3.037) in the multivariate comparison.

**Conclusion:** TCN1 overexpression is associated with poor therapeutic response and adverse outcomes in rectal cancer patients receiving CCRT, justifying the potential prognostic value of TCN1 in rectal cancer receiving CCRT.

**Keywords:** TCN1, Rectal cancer, CCRT.
PP3-071
Improvement of Rectal Cancer Survival during Four Decades: An Analysis of 4073 Patients in a Single Center

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Background: Colorectal cancer is the third and second most common cancer in men and women, respectively. Recent advances in surgical techniques, perioperative management, and adjuvant treatment have resulted in survival improvement after rectal cancer surgery.

Purpose: The aims of current study were to investigate the changing pattern and chronological survival improvement after surgical treatment.

Materials and Methods: A total of 9,599 consecutive patients with colorectal cancer underwent surgery at the Seoul National University Hospital between 1973 and 2010. Excluding 5,526 patients with colon cancer, 4,073 patients with rectal cancer were included in this study. The period of operation was divided into four to compare survival rate between decades, P1 (1973–1981, n = 290), P2 (1982–1986, n = 332), P3 (1987–2000, n = 1650) and P4 (2001–2010, n = 1801). Demographics of the patients, operative and pathologic findings, and adjuvant therapy were retrospectively reviewed. Circumferential resection margin (CRM) has been measured from 2002 in our institution.

Results: The mean follow-up was 141.3 months. The median survival was 62.0 months and 5-year overall survival rate was 55.7%. Overall survival has improved significantly as time progressed (5-year overall survival rate: 26.0% [P1], 39.4% [P2], 47.7% [P3] and 70.5% [P4]; p < 0.001). In stage-stratified analysis according to the period of operation, overall survival has also improved in recent periods. Gender, age, carcinoembryonic antigen level, pathologic stage, adjuvant chemotherapy, curative resection and CRM have been significant prognostic factors in the multivariable analysis. The local recurrence rate decreased significantly (P4 versus P1: HR = 0.146~0.275, p < 0.001) were significant prognostic factors in the multivariable analysis. The rate of CRM involvement (≤1 mm) was 3.36%.

Conclusions: Overall survival, rate of sphincter preserving surgery and local recurrence in the patients with rectal cancer has improved significantly as time progressed in a single center.

Keywords: Survival, Rectal neoplasm, Colorectal neoplasm.

PP3-072
Is Taj Mahal Operation the Gold Standard for Treatment of Central Liver Tumours?

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Background: The Taj Mahal Operation, first described by Kawarada in 1999, was originally performed for carcinoma of the biliary tract but has found applicability for a wide variety of liver tumours as well. The operation has a distinct set of benefits and disadvantages. The Jury is still out on whether it remains the ideal surgical procedure for centrally located hepatobiliary tumours.

Methods: A 29 year old Somali youth presented to us with complaints of Pain and Swelling of the abdomen x 3 months duration. He was evaluated with Ultrasound and PET CT Scan which revealed a 11 x 11 cms tumour with necrotic areas occupying Segments IV, V & VIII of the Liver. Owing to the risk of Post Hepatotomy Liver failure with Lt. Trisectionectomy, it was decided to perform the Taj Mahal Operation (Mesohepatectomy/Central Hepatectomy). After Porta & IVC control, Ischaemic Preconditioning was performed twice followed by Liver Parenchymal transection with Diathermy & Thunderbeat (Olympus). The pedicles to the tumour & Segment 4 (from Lt Portal Vein) and Segments V & VIII from Rt. Anterior Portal Vein were individually ligated, clipped and divided. Middle hepatic vein was ligated at the upper aspect of the tumour. Pringle’s manoeuvre and IVC clamping were never used throughout the surgery. The procedure took 8 hours and the estimated blood loss was 600 ml.

Results: The patient made a smooth postoperative recovery and was discharged on POD 5. Biopsy revealed Giant Hepatocellular Carcinoma (Confirmed on Immunohistochemistry) with negative surgical margins.

Conclusion: There is paucity of medical literature comparing Central Hepatotomy with Extended Hepatectomies in the management of Centrally located Hepatobiliary tumours. The benefits of the Taj Mahal Operation include parenchymal preservation, comparable oncological, perioperative and postoperative outcomes & opportunity for repeat resection in recurrent tumours. Further studies are required to validate the excellent outcomes.

Keywords: Hepatocellular carcinoma, Taj mahal operation, Mesohepatectomy, Central hepatectomy, Pringle’s manoeuvre, Ischaemic preconditioning, Parenchyma preserving liver resection.
Hepatic Resection for Hepatocellular Carcinoma in Cirrhotic Patients with Portal Hypertension

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Background: Hepatic resection (HR) in cirrhotic patients with Hepatocellular carcinoma (HCC) and portal hypertension (PHT) is not recommended according to the international guidelines. The aim of this work is to study the outcome of HR for HCC in cirrhotic patients with PHT.

Methods: It is a single institutional retrospective study of 170 Child-Pugh class A cirrhotic patients underwent HR for HCC from 2011 to July 2015. The patients were divided into two groups according to the presence and absence of PHT.

Results: PHT was present in 91 patients (53.5%). The postoperative morbidity was non-significantly higher in patients with PHT than patients without PHT (31.9% vs. 25.3% respectively, P = 0.36). Patients with PHT showed 90-day perioperative mortality (3.3%) similar to patients without PHT (2.5%). In subgroup analysis, the 1-, 3-, and 5-year overall survival (OS) for patients with limited HR was 90.3%, 74.3%, and 66.2%, respectively for patients with PHT, and 93.9%, 84.3%, and 78.6%, respectively for patients without PHT, without significant difference (P = 0.38).

Conclusion: HR in Child-Pugh class A cirrhotic patients with PHT is safe and effective procedure with good short and long-term outcomes in comparison to patients without PHT especially with limited liver resection.

Keywords: Hepatocellular carcinoma, Liver resection, Portal hypertension, Cirrhotic liver.

Cytoreduction Surgery with Hyperthermic Intra-peritoneal Chemotherapy in Patients with Peritoneal Hepatocellular Carcinoma after Sorafenib Failure

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Peritoneal metastasis of hepatocellular carcinoma is regarded as a poorly treatable malignant disease. Over the past decade, the modalities that combine cytoreductive surgery (CRS) with hyperthermic intraperitoneal chemotherapy (HIPEC) have shown favorable outcomes in certain malignancies; while, their role in peritoneal HCC remains unknown. We present two patients with peritoneal metastases from hepatocellular carcinoma due to tumor rupture in their previous minimal invasive surgery. They received sorafenib treatment for 3 months but the treatment failed. They were then treated with CRS plus HIPEC. Intraoperative PCI was 15 and 22; multiple small hepatic nodules and lymphatic invasion were also noted intra-operatively. Complete macroscopic cytoreduction (CCR 0-1) was achieved. They discharged 3 weeks after the operation. Abdominal CT in post-operative 3 months showed no residual peritoneal tumors. The combination treatment of CRS and HIPEC is effective to remove peritoneal tumors of HCC. It can be considered in patients with adequate preservation of liver function. It may be done as early as possible to decrease the risk of tumor spread via blood or lymphatic routes.

Keywords: Cytoreduction surgery, Hyperthermic intraperitoneal chemotherapy, Peritoneal metastasis, Hepatocellular carcinoma.
PP3-076
Prognostic Value of Tumor Infiltrating CD8+ T Cells and FoxP3+ Treg in HCC Patients after Surgical Treatment
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Background/Aims: The effectiveness of immunotherapy against advanced hepatocellular carcinoma (HCC) was limited due to the immune escape mechanism. CD8+ T cells (CTL) were believed to play crucial roles in the anti-tumor immune reaction. On the other hands, FoxP3+ regulatory T cells (Treg) were thought to impaired cell-mediated immunity and promoted disease progression. We evaluated in this study prognostic impact of tumor infiltrating CTL and Treg in HCC after surgical treatment at our institute.

Methods: We examined correlation between tumor infiltrating CTL or Treg and prognosis after surgery for HCC between March 2004 and March 2016. The degrees of infiltration of CTL and Treg were evaluated by immunostaining of 39 cases in 41 cases of resected HCC. The number of CD8 and FoxP3-positive cells were manually counted in randomly three selected areas in the tumors under microscope. The degrees of infiltration of CTL and Treg were divided in two groups, one was high infiltration group and another was low infiltration group using cutoff value of the median of all cases.

Results: Five-year survival rate and the median survival after surgery of 41 resected HCC cases were 59.0% and 66.5 months, respectively. The CTL high infiltration group tended to have better overall survival (OS) and relapse free survival (RFS) than low infiltration group, however the difference was not statistical significant. The Treg low infiltration group tended to have better OS and RFS than high infiltration group and the difference was statistical significant in RFS. The significant correlation was not found between infiltration of CTL and Treg.

Conclusions: This study revealed that tumor infiltrating CTL had positive and Treg had negative effect for prognostic value in HCC as some previous reports. We have plans to evaluate immune checkpoints molecules such as PD-L1 in HCC to clarified immune surveillance systems as next step.

Keywords: CD8, FoxP3, HCC.

PP3-077
Surgical Outcomes of Open and Laparoscopic Liver Resection for Hepatocellular Carcinoma in a Developing Country: A Single Center Study in the Philippines
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Background/Aims: Surgical outcomes of liver resection for hepatocellular carcinoma (HCCA) have shown improvements in terms of post operative morbidity and mortality in the past decade. Evidence however relies heavily from observations made in Western and developed countries. Little is known with the current surgical outcomes in developing countries such as the Philippines. The Philippines is known hyper endemic for Hepatitis B infection which situate more people at risk of developing HCCA. No data has been published with regards to the outcomes for liver resection within the country. Recently, laparoscopic hepatectomy has started to embark within the country but limited to very few centers. This study aimed to determine the short term (30 days) surgical outcomes of open (OLR) and laparoscopic liver resection (LLR) in a liver center in the Philippines. Surgical outcomes determined were morbidity, mortality, and length of hospital stay.

Methodology: Medical records between 2009 and 2015 were reviewed and a set inclusion and exclusion criteria were described. Factors affecting outcomes were identified.

Results and Discussion: Among 102 cases of liver surgery from 2009 to 2015, a total of 45 cases for OLR and 12 cases for LLR were found eligible. Measured overall morbidity and mortality were 34.8% and 8.9% for OLR, while 16.7% and 0% for LLR. Overall mean length of hospitalization was 10.3 ± 6.2 and 3.8 ± 2.1 days for OLR and LLR. Surgical outcomes in terms of morbidity, mortality, and length of hospital stay for OLR are relatively higher compared to other published studies in Western and developed countries which could possibly accounted to difference in characteristics of patient population.

Conclusion: OLR resection for HCCA remains challenged with relatively higher morbidity and mortality in the country. Emergence of laparoscopic resection remains promising outcomes however with limited samples to draw conclusions.

Keywords: Hepatocellular carcinoma, Liver resection, Surgical outcomes.

PP3-078
Three-Dimensional Conformal Radiotherapy for Portal Vein Tumor Thrombosis in Advanced Hepatocellular Carcinoma
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Aims: We sought to evaluate the clinical outcomes of 3-dimensional conformal radiation therapy (3D-CRT) for portal vein tumor thrombosis (PVTT) in patients with advanced hepatocellular carcinoma. Evidence however relies heavily from observations made in Western and developed countries. Little is known with the current surgical outcomes in developing countries such as the Philippines. The Philippines is known hyper endemic for Hepatitis B infection which situate more people at risk of developing HCCA. No data has been published with regards to the outcomes for liver resection within the country. Recently, laparoscopic hepatectomy has started to embark within the country but limited to very few centers. This study aimed to determine the short term (30 days) surgical outcomes of open (OLR) and laparoscopic liver resection (LLR) in a liver center in the Philippines. Surgical outcomes determined were morbidity, mortality, and length of hospital stay.

Methodology: Medical records between 2009 and 2015 were reviewed and a set inclusion and exclusion criteria were described. Factors affecting outcomes were identified.

Results and Discussion: Among 102 cases of liver surgery from 2009 to 2015, a total of 45 cases for OLR and 12 cases for LLR were found eligible. Measured overall morbidity and mortality were 34.8% and 8.9% for OLR, while 16.7% and 0% for LLR. Overall mean length of hospitalization was 10.3 ± 6.2 and 3.8 ± 2.1 days for OLR and LLR. Surgical outcomes in terms of morbidity, mortality, and length of hospital stay for OLR are relatively higher compared to other published studies in Western and developed countries which could possibly accounted to difference in characteristics of patient population.

Conclusion: OLR resection for HCCA remains challenged with relatively higher morbidity and mortality in the country. Emergence of laparoscopic resection remains promising outcomes however with limited samples to draw conclusions.

Keywords: Hepatocellular carcinoma, Liver resection, Surgical outcomes.
was complete response in 3 patients (3.1%), partial response in 36 (36.4%), stable disease in 35 (35.4%), and progressive disease in 17 (17.2%). In overall tumor response, complete response was 1 (1.0%), partial response was 22 (22.2%), stable disease was 23 (23.2%), and progressive disease was 46 (46.5%). PVTT response was significantly associated with number of radiation fraction (p = 0.044). Overall objective tumor response was significantly associated with number of radiation fraction (p = 0.040) and metastatic status (p = 0.046). There were 5 cases of grade 3 liver function aggravation during or 1 month after radiotherapy. The 1-year and 2-year survival rate was 40.2% and 19.3%, respectively. Survival was significantly associated with overall tumor response (p = 0.034), etiology (p = 0.007) and number of radiation fraction (p =

Conclusions: Conformal radiotherapy with or without TACE for PVTT could be chosen as a palliative treatment modality in patients with unfavorable conditions (liver, patient, or tumor factors).

Keywords: Hepatocellular carcinoma, Portal vein tumor thrombosis, 3-dimensional conformal radiotherapy.

Impact of Branched-Chain Amino Acid-Enriched Nutrient on Liver Cirrhosis with Hepatocellular Carcinoma Undergoing Transcatheter Arterial Chemoembolization in Barcelona Clinic Liver Cancer Stage B: A Prospective Study

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Background/Aims: In decompensated liver cirrhosis, hypoalbuminemia still persists after they have been treated with branched-chain amino acid (BCAA) granules. We prospectively evaluated whether BCAA enriched nutrient switched from BCAA granules would increase the serum albumin level, and consequently extend the survival time after HCC treatment.

Methods: This study included 77 consecutive patients treated for decompensated liver cirrhosis with HCC. After the nutritional assessment, all patients initially received BCAA granules. In patients with unchanged or decreased serum albumin levels, BCAA granules were discontinued and BCAA enriched nutrient was started. Transcatheter arterial chemoembolization (TACE) for HCC were performed in those with an improved Child-Pugh score.

Results: According to the dieticians assessment, the mean total calorie and protein intake in 77 patients were below the required level: 1880 kcal and 72 g. The intensive nutritional education and the use of BCAA granules increased the serum albumin level only in 32 of 77 (41.6%) patients. Of those with an unchanged serum albumin level (n = 45; 58.4%), BCAA granules were switched to BCAA enriched nutrient in 39 patients. The Child-Pugh score increased in 30 of 39 (76.9%) patients at 3 months of using BCAA enriched nutrient. TACE were conclusively performed following the aggressive intervention with BCAA nutritional education in 54 of 77 (70.1%) patients. Finally, survival time was significantly extended in the TACE group (p < 0.0001).

Conclusion: Timely aggressive nutritional intervention in BCLC stage B HCC, early partial replacement with BCAA enriched nutrient may consequently improve the treatment outcome of HCC.

Keywords: Hepatosellular carcinoma, Branched-chain amino Acid, Decompasated liver cirrhosis, Transcatheter arterial chemoembolization, Protein-energy malnutrition.

Laparoscopic hepatectomy has come to be widely performed today. However, anatomical segmental resection is still technically demanding with a high degree of difficulty. Laparoscopic limited anatomical liver resection can be performed by extra-hepatic Glissonian approach of the hilum. Sectionectomy, sub-sectionectomy and mono-segmentectomy should employ Glissonian approach, because extra-fascial approach cannot be performed in these limited anatomical resections. On the other hand, the progress of recent diagnostic imaging is remarkable, and pre-operative simulation by DICOM data of CT scan makes it possible to construct 3D image of Glissonian pedicles, We report a case of 69-year-old woman with HCC based HBV carrier. HCC is located segment 8. Child-Pugh score was Grade A (6 points), and ICG retention rate at 15 minutes was 16%. We performed laparoscopic anatomical S8 segmentectomy by extra-hepatic Glissonian approach of the hilum. Operation time was 349 minutes, and blood loss was 60 ml. The patient was discharged from hospital five days after the surgery with no complication. Better exposure from laparoscopic caudal approach with magnification and pre-operative simulation of 3D image of Glissonian pedicles made this technically demanding surgery safer and more precise. Also pneumoperitoneum and the intermittent Pringle’s maneuver method synergistically reduced bleeding. Here, we report this case with detailed description of the technique and discuss about the importance of pre-operative simulation on this case.
Abstracts
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PP3-081
One-Way Laparoscopic Anatomical Liver Resection Based on Laennec’s Capsule for a High Degree of Difficult Procedure
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Background: Laparoscopic anatomical liver resection is still technically demanding. We proposed the novel concept of the liver anatomy based on Laennec’s capsule. This concept contributed to standardize open anatomical liver resection as one-way resection with extrahepatic Glissonean pedicle isolation and landmark vein exposure along with craniocaudal parenchymal dissection. Herein we report the standardization of the surgical techniques of one-way laparoscopic anatomical liver resection especially for a high degree of difficult procedure such as segmentectomy, anterior sectionectomy, and isolated total caudate lobectomy.

Surgical Techniques: Standardized method for one-way segmentectomy and anterior sectionectomy takes the following steps: extrahepatic Glissonean pedicle isolation and interruption, exposure of the middle hepatic vein by craniocaudal parenchymal dissection, division of Glissonean pedicle at the cutting surface, exposure of the right hepatic vein and removal of the target area in just proportion. One-way isolated total caudate lobectomy can be conducted in a similar manner: all extrahepatic caudate Glissonean pedicles isolation and division, craniocaudal parenchymal dissection exposing the dorsal surface of the middle and right hepatic veins and removal.

Results: We performed 51 cases of laparoscopic anatomical resection (30.4%) including 13 cases of Segmentectomy, 5 cases of anterior sectionectomy, and 3 cases of isolated total caudate lobectomy. Postoperative courses were uneventful except for one patient who suffered from bowel obstruction (C-D grade IIIb).

Conclusion: One-way laparoscopic anatomical liver resection based on Laennec’s capsule contributed to establish safe and feasible laparoscopic anatomical resection for a high degree of difficult procedure.

Keywords: Laparoscopic liver resection, Anatomical resection, Laennec’s capsule.

PP3-082
Surgical Indications and Technique for Laparoscopic Partial Hepatectomy for Colorectal Liver Metastases
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Background: Partial hepatectomy has been the conventional surgical option for colorectal liver metastasis (CLM).

Methods: To elucidate the efficacy of laparoscopic partial hepatectomy (LPH) for CLM, this study comparatively analyzed the invasiveness and short-term prognosis of LPH (n = 41) and open partial hepatectomy (OPH) (n = 99) performed for CLM. Indications for LPH: Although there was no limit to the number and size of tumors, it was often difficult to treat tumors larger than 8 cm. The tumor in lateral or inferior segments was considered the most appropriate location. In the case of LPH for the tumor in superior segments, HALS or using intercostal trocars was useful. Many of the patients with CLM had a history of laparotomy or colostomy. In these patients, preoperative abdominal ultrasound is useful for assessing the risk of intra-abdominal adhesions Surgical techniques of LPH: Depending on tumor location, Patients underwent surgery in the left semi-lateral position or supine position. Trocars were inserted into 3–5 ports around the tumor site. Laparoscopic coagulation shears is generally useful for transection of superficial liver parenchyma. Deeper transactions require careful use of CUSA, and small vessels were transected by a bipolar sealing system or clipping. Although the top priority was to ensure complete resection, we aimed to resect with a 10-mm margin as possible.

Result: The LPH group had a significantly higher number of metachronous and solitary tumors. Compared with the OPH group, the LPH group had significantly shorter hospital stay. Concerning the OS and DFS, there were no significant differences between procedures in the metachronous single tumor cases.

Conclusions: LPH is a well-accepted surgical option for CLM. However, to maximize the efficacy of LPH, it is necessary to comply with the indications to ensure the curability and safety of patients, perform detailed preoperative diagnostic imaging, and use the correct surgical devices.

Keywords: Laparoscopic hepatectomy, Colorectal liver metastasis, Partial hepatectomy.
**PP3-083**

**Laparoscopic Left Hemihepatectomy by Dorsal Approach**

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**Introduction:** We report our standardized procedure for laparoscopic left hemihepatectomy utilizing laparoscopic-specific view from caudodorsal side.

**Operative Procedure:** A trocar for scope was placed at the umbilicus, and four working trocars were placed just beneath the costal arch of the right abdomen, right hypochondrium, median epigastrum and left hypochondrium, respectively. After dissection of the left coronal ligament, the left lateral segment was lifted and the parenchyma between the Arantius duct and the middle hepatic vein was divided from the right side of the middle hepatic vein toward the periphery. The left Glissonian pedicle was isolated at the peripheral side of the Arantius plate and divided by linear stapler safely because its back side had been opened widely. After that, the parenchyma between the demarcation line on the liver surface and exposed middle hepatic vein was divided. Finally, the left hepatic vein was cut at the confluence to the middle hepatic vein by linear stapler, and the left hemihepatectomy was completed.

**Results:** Between November 2010 and December 2015, we performed laparoscopic left hemihepatectomy in 11 patients. One patient who had uncontrollable high pressure of Vena Cava because of chronic heart failure had been converted to open method before initiating hepatectomy. The mean operative time was 309 minutes with a mean blood loss of 170 g. There was no intraoperative transinitiating hepatectomy. The mean operative time was 309 minutes with a mean blood loss of 170 g. There was no intraoperative transinitiating hepatectomy.

**Conclusion:** Because the Arantius duct is close to the middle hepatic vein, early exposure of the middle hepatic vein from the dorsal side makes laparoscopic left hepatectomy more feasible, by securing safety during dividing the left Glissonian pedicle with a stapler and identifying the middle hepatic vein as a significant landmark to make an appropriate cutting surface.

**Keywords:** Laparoscopic hepatectomy.

**PP3-084**

**Role of Transient Elastography (TE) in Non-Invasive Evaluation of Advanced Portal Hypertension**

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It has been recently proposed that sustained portal hypertension (PHT) might play a role in the pathophysiology of late stages of underlying chronic liver disease (CLD). Furthermore management of advanced PHT has been a challenge both to liver physicians and surgeons alike. This information highlights the importance of obtaining accurate assessment of PHT grade if influence is to be made in those areas. PHT is best assessed by measuring hepatic venous pressure gradient (HVPG) which is expressed in mm Hg. Unfortunately, this measurement requires invasive technique, and so far is performed only in advanced centres. Otherwise, in today’s routine clinical practice the endoscopic (OGD) finding of oesophageo-gastric varices (OGV) with or without portal hypertensive gastropathy is considered an indicator of advanced PHT. Hepatic periportal fibrosis (PPF) is the form of CLD that is typically complicated by a hefty rise in portal pressure. PHT complicating PPF would be a good example to study as compared to PHT related to other aetologies of CLD. More recently the non-invasive technique of transcutaneous elastography (TE), otherwise known as fibroscan, has been introduced to assess the degree of liver fibrosis in CLD. It is not clear whether TE findings might correlate to OGD/HVPG information. This review discusses the relationship with special emphasis on PPF-related PHT.

**PP3-085**

**Clinical and Laboratory Features of Decompensated Liver Cirrhosis in a Cohort of Patients at Tertiary Care Hospitals in Pakistan**

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**Objectives:** The objectives of our study were to know the clinical presentation, frequency of classical clinical signs, ultrasound findings, and abnormalities in laboratory investigations in patients with decompensated cirrhosis.

**Method:** 162 consecutive patients with decompensated cirrhosis admitted in Mayo Hospital, Lahore were enrolled in the study. Patients were examined at bedside and presence of classical signs of cirrhosis was noted. Patientwerekasedaboutpresenc eof morbidconditions. Records of the patients were reviewed and findings on abdominal ultrasound and abnormalities on laboratory investigations were noted.

**Results:** Sixty percent of 162 patients were male. Hepatic encephalopathy was the most common presentation (46%) followed by ascites (33%) and hematemesis (33%). Twenty four percent patients had malena also. About one third (35%) of patients were diabetic and one fourth (27%) hypertensive. Jaundice was the most common clinical sign (55%) followed by peripheral edema (54%). Digital clubbing was present in 9% of patients while palmar erythema in 12% of patients. Ultrasonography revealed enlarged spleen (12 cm) in 56% of patients and ascites in 62% of patients. Hepatitis C was the cause of cirrhosis in 82% of patients while hepatitis B in 9%. About one third had blood bilirubin levels more than 1.2 mg/dl and a similar proportion had albumin less than 3.4 g/dl. Anemia (Hemoglobin<12 g/dl) was present in 80% of patients.

**Conclusion:** Hepatic encephalopathy is the most common clinical presentation of decompensated cirrhosis. Jaundice and peripheral edema are the most common clinical signs of cirrhosis.
Incidence and Risk Factors for Shunt Thrombosis Following Proximal Splenorenal Shunt in Patients with Extrahepatic Portal Venous Obstruction  

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Introduction: Extrahepatic portal venous obstruction (EHPVO) is defined as obstruction of the extra hepatic portal vein with or without involvement of the intrahepatic portal veins or splenic or superior mesenteric veins. Shunt surgery is indicated for patients who have bled, have significant growth retardation before puberty, symptomatic portal biliopathy and symptomatic hypersplenism. Proximal Splenorenal shunt (PSRS) is an established treatment for EHPVO. Imperative to the success of PSRS is shunt patency following surgery. Few studies have included data on shunt patency. Most of the data is retrospective, included heterogeneous surgeries and the method of evaluating shunt patency was not clearly defined. We prospectively analyzed incidence and risk factors for shunt thrombosis in these patients.

Patients and Methods: From July 2014 to October 2015, 33 patients of EHPVO underwent PSRS. Various preoperative, intraoperative and postoperative variables were recorded. Shunt patency was assessed at three months with a contrast enhanced computed tomography (CECT) abdomen.

Results: Of the 33 patients who underwent PSRS, two patients were lost to follow up. Of 31 patients, shunt thrombosis was noted in 11 patients (35%). On Univariate analysis, preoperative haemoglobin ≤10.3 gm/dl, platelet count ≥65000, shunt size ≤8.5 mm, Day 3 drain amount ≥255 ml, need for drain for ≥7.5 days and Clavien Dindo grade ≥2 post operative complication were found to significantly more in thrombosed group (p < 0.05). Pre operative haemoglobin ≤10.3 g/dl, platelet count ≥65000 and shunt size ≤8.5 mm were found to be independent predictors for increased risk of shunt thrombosis on multivariate analysis.

Conclusion: Eleven out of 35 patients had shunt thrombosis following PSRS with low haemoglobin level, near normal platelet count and small shunt size being independent risk factors for shunt thrombosis.

Keywords: Extrahepatic portal venous obstruction, Proximal splenorenal shunt, Shunt thrombosis.

Lessons Learned from Liver Transplantation: Application of the Microsurgery in HPB and General Surgery

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General surgery capability must be always include medical and technical implementation. Microsurgery vascular Anastomosis can be an excellent option in order to achieve the solution for technical barrier in several procedures in the general surgery area.

The aim of this presentation is to show our experience in the different procedures that we find hight complexity to vascular reconstruction: Right hepatic artery microvascular reconstruction after liver and pancreatic cancer resection, liver transplantation with living related donor, free jejunal graft for intestinal reconstruction. Total esophageal resection with discharge of the abdominal wall after total resection of intra and extraperitoneal desmoid tumor.

We show the different surgical aspects.

The Predictors which Affect the Sustained Virological Response in Chronic Hepatitis C Genotype 1 Patients: A Cohort Study in the Real Life Setting from Turkey

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Aim and Background: The reappearance rates of hepatitis C virus (HCV) RNA after a sustained virological response (SVR) have been reported to be 1–2%. We investigated the reappearance rate and predictors of HCV RNA after SVR in chronic hepatitis C (CHC) patients treated with interferon (IFN) plus ribavirin or pegylated interferon (PEG-IFN) plus ribavirin.

Methods: In total, 318 genotype1 CHC patients who treated with IFN/PEG-IFN and ribavirin were included. The pre-treatment parameters that were estimated to be likely to influence the response to treatment (e.g. as age, gender, body mass index, liver enzymes, lipid profile, HCV-RNA load, genotype, liver biopsy, and so on) and, viral kinetics were evaluated. The relationship between these parameters and the sustained viral response was investigated.

Results: Among the 318 patients, were followed up for more than 6 months after SVR. These 318 patients were aged 52.1 ± 10.1 years (mean±SD), and 119 (37.7%) of them were male. Two hundred twenty one patients (69.49%) achieved the end of treatment response (ETR) and 175 patients (55.03%) achieved the SVR. Fifty two patients relapsed (16.35%) after achieved ETR. Reappearance of HCV occurred within 6 months after end of treatment in all relapers. The median follow-up duration was 18 months (range 6–60 months). The reappearance rate of HCV RNA during follow-
Nonparasitic Liver Cysts: Different Treatment Strategies

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Abstracts

Objectives: The aim of this work is to study the clinicopathological data of nonparasitic liver cysts (NPLC), its different management modalities and outcome.

Methods: This is a retrospective study of patients that were diagnosed to have NPLC from January 2005 to January 2016. The clinicopathological data, surgical and non-surgical treatment, and outcomes of these patients were studied.

Results: NPLC was present in 118 patients. The female patients were (78, 66.1%), and the median age was 48 years. Simple liver cysts (SLC) were the majority of cases (95, 80.5%) and its management was; conservative treatment with follow up (51 patients, 53.7%), percutaneous aspiration, puncture aspiration injection and reaspiration (PAIR) or pigtail catheter drainage (26 patients, 27.4%), and surgical treatment (18 patients, 18.9%) either by laparoscopic deroofing (12 patients) or open surgery (6 patients). Six patients (5.1%) had intra-hepatic biloma underwent percutaneous aspiration or pigtail drainage. Five patients (4.2%) had cystadenoma that underwent resection or pericyctectomy. Five patients (4.2%) had post traumatic hematoma and underwent conservative treatment. Three patients (2.5%) had polycystic liver disease (PCLD), 1 of them underwent laparoscopic deroofing of large ones, and 2 patients had conservative treatment. Two patients (1.7%) had Caroli’s disease that was prepared for liver transplantation. Two patients (1.7%) had cysts with biliary atresia that underwent Kasai operation with excision of the cyst.

Conclusions: Most of the nonparasitic liver cysts are SLC, which can be managed conservatively if it was asymptomatic and small, or by Percutaneous radiological intervention or laparoscopic deroofing for large symptomatic or recurrent ones. Open or laparoscopic resection or pericyctectomy is reserved for cystic neoplasms which is not common.

Keywords: Liver cyst, Simple liver cyst, Laparoscopic deroofing, Cystic biliary atresia.

PP3-090
The Usefulness of Preoperative Transcatheter Arterial Embolization for Huge Hemangioma with Coagulopathy
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A Sixty-five-year-old Japanese man had hepatic hemangioma pointed out when cholecystectomy was performed in 1993. He was admitted to our hospital in 2015 because the size of the tumor gradually increased. Clinically laboratory examination showed anemia (Hemoglobin, 937 g/dl) and thrombocytopenia (platelet, 147000/μl). Abdominal computed tomography demonstrated that huge hemangioma occupied the right lobe of the liver. Transcatheter arterial embolization (TAE) was performed due to reduction of the tumor size and improvement of the coagulopathy. We performed right trisectionectomy after two days of TAE. The postoperative course was uneventful and he was discharged on postoperative day 12. Most of hepatic hemangioma are asymptomatic and incidentally detected during medical health checkups. They do not generally require any treatment. However, surgical resection is occasionally performed if they are symptomatic. In our case, hepatectomy was performed safely after the reduction of tumor by preoperative TAE although the patient had huge hemangioma with coagulopathy occupying the whole right lobe of the liver. Preoperative TAE is likely to be useful for performing safer hepatectomy for huge symptomatic hemangioma.

Keywords: Hepatic hemangioma, Transcatheter arterial embolization.

PP3-091
A Successful Resection for Leiomyosarcoma Originated from the Main Trunk of the Portal Vein: Report of a Case
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Tumors of the portal venous system origin have been rarely reported. We experienced a case with leiomyosarcoma originated from the main trunk of the portal vein. We report the case and do review of the literatures. We saw a 62-year-old woman having leiomyosarcoma originated from the main trunk of the portal vein. She had no complaint and a thoracoabdominal enhanced CT was performed as a preoperative evaluation for breast cancer. A large intra-abdominal tumor was detected in hepatoduodenal ligament by an enhanced abdominal computed tomography without any complaint. The tumor size was 8 cm diameter which originated from the portal vein trunk and main trunk of the portal vein was completely obstructed with well-development of the collateral veins to the liver. The tumor was diagnosed leiomyosarcoma, and total excision of the tumor and the portal vein trunk could be car-
ried out to maintain the portal venous flow to the liver by preserving collateral veins. Histopathological examination revealed a diagnosis of leiomyosarcoma originating from the portal vein. She had an uneventful postoperative course and she had no adjuvant chemotherapy treatment. So far, she has been alive for 2 years after resection. Leiomyosarcoma of portal veins origin is a very rare disease and typically has a poor prognosis. Although curative surgery for this disease with well-developed collateral veins was often difficult, aggressive surgery may improve long term survival.

**PP3-092**

**A Resectable Case of Hilar Cholangiocarcinoma Complicated with Hepatic Alveolar Echinococcosis**

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A 80-year-old man received distal gastrectomy for gastric cancer with hemorrhage in a previous hospital. A slight intrahepatic bile duct dilatation was pointed out before the operation but it was observed the progress. Nine months after the operation, abdominal CT revealed a prominent intrahepatic bile duct dilatation of left hepatic lobe. Laboratory data showed the elevation of bilirubin enzymes and CEA, then he referred to our hospital. Abdominal CT showed a mass lesion with unclear boundary in hepatic segment 4, combined with wall thickening and stenosis from the left to the confluence of hepatic duct. Low density lesion of 9 mm in diameter in hepatic segment 6 was also revealed by CT, and was diagnosed as a liver abscess by abdominal US. Under the diagnosis of perihilar cholangiocarcinoma, left hepatectomy with caudal lobectomy, bile duct resection, and a partial resection of segment 6 lesion were performed. Histopathological study of segment 6 lesion demonstrated cuticle layer containing protoscoleces which was diagnosed as hepatic alveolar echinococcosis complicated with perihilar cholangiocarcinoma. Another echinococcosis lesion was found in segment 4 besides the cholangiocarcinoma as well.

**Keywords:** Hepatic alveolar echinococcosis, Hilar cholangiocarcinoma.

**PP3-093**

**Ten Year Audit of Patients Admitted to the Medical Wards of Komfo Anokye Teaching Hospital for Chronic Liver Diseases**

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**Introduction:** Ghana is one of the countries with high prevalence of chronic liver diseases with about 33 deaths per 100,000. Every 2 out of 10 admissions into our medical ward present with one form of liver disease or the other. Our study aimed to audit the various causes of medical admissions due to chronic liver diseases and the outcome of management.

**Methodology:** We reviewed the medical ward admission and discharge register of our hospital and data regarding age, sex, clinical diagnosis and outcome of management for all cases of chronic liver disease over 10 years were entered into excel spreadsheet and analysed using the SPSS version 20. The findings were compared with our environment and the world at large.

**Result:** Of the 3530 patients admitted for chronic liver diseases during the study period, 3298 were males while 232 were females constituting 93.4% and 6.6% respectively; and with M:F ratio of 14:1. The range of diseases seen include liver cirrhosis (51.8%), alcoholic liver disease (9.5%), hepatocellular carcinoma (37.7%) while liver abscess, cholestatic liver disease and metastatic cancer to liver constituted about 1% of the patients studied. Out of the patients with cirrhosis, 79.6% and 16% were associated with hepatitis B and C and alcohol respectively while 4.4% were associated with a combination of factors. About 4% of patients with cirrhosis presented in decompensated states. Of the patients with hepatocellular carcinoma, 63.2% and 36.8% was with and without cirrhosis respectively. During the admission, a total of 2219 (62.9%) were discharged while 1311 (37.1%) died.

**Conclusion:** Our study showed that chronic liver diseases are common in our environment and viral hepatitis B and C and alcohol are important aetiological factors.

**Keywords:** Chronic liver diseases, Hepatitis B and C, Alcohol, Cirrhosis, Hepatocellular carcinoma.

**PP3-094**

**Effects of Aging on the Hepatic Functional Reserve**

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**Background:** With the lengthening of the average life span, the number of elderly individuals undergoing liver resection has increased. It is essential to make an accurate assessment of the hepatic functional reserve before liver resection. However, the effects of aging on the hepatic functional reserve have not yet been clear-
ly determined. The aim of this study was to clarify the liver functional changes in relation to aging.

**Methods:** 195 patients undergoing liver surgery at our facility were studied. We divided the patients into three groups (A group: <65 years old, B group: 65–74 years old, C group: >75 years old) according to age at surgery. The preoperative liver function tests were retrospectively reviewed and compared between the three groups. The liver volumes estimated with automated CT volume. The portal vein diameter measured by CT image.

**Results:** The A group included 93 cases, B group 72 cases and C group 30 cases. The patient’s body height, body weight and body surface area decreased with age. The albumin levels decreased with age, and statistically significant differences were observed between group A and the other groups. However, percent of normal prothrombin time activity, total bilirubin, indocyanine green test, aspartate aminotransferase and alanine aminotransferase did not demonstrate consistent trends with aging. The liver volumes and portal vein diameter decreased with age. Regarding the liver volumes, there were statistically significant differences between groups A and C. The albumin level per body height, body weight and body surface area did not demonstrate statistically significant differences among the groups. Similarly, no consistent trends with aging were observed regarding the albumin level per the liver volumes and portal vein diameter.

**Conclusions:** The changes in the liver function were inconsistent with aging. The decrease of albumin level may not correlate to the decrease of albumin synthetic ability.

**Keywords:** Aging, Liver, Hepatic functional reserve.

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**PP3-095**  
**Isolated Hepatic Perfusion Chemotherapy for Unresectable Malignant Hepatic Tumors**  
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Treatment failure with conventional approaches, including systemic and regional chemotherapy, for refractory advanced primary or metastatic hepatic cancers has caused periodic waves of enthusiasm for isolated hepatic perfusion (IHP) over the past 50 years. With technical refinements of the procedure and the introduction of a novel biochemical regimen combining tumor necrosis factor and melphalan, several hepatobiliary-oncological centers initiated clinical trials of IHP in the 1990s. In parallel, a percutaneous technique of IHP has been developed in this era as a minimally invasive, simple form of IHP, and phase I and II studies have been done in some specialized centers.

The present study show our experience, the review past and current techniques of IHP and the possible future role in the treatment of unresectable primary and secondary hepatic tumors.

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**PP3-096**  
**Effect of Antithrombotic Agents on the Development of Oxaliplatin-Associated Liver Injury in Patients with Colorectal Cancer Liver Metastasis**  
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**Background:** Oxaliplatin is an essential drug for treating colorectal liver metastasis (CRLM). Conversely, oxaliplatin has also been shown to cause sinusoidal injury (SI). Some authors have already reported that chemotherapy-associated SI increases the morbidity and mortality after liver resection due to an impaired remnant liver function. Therefore, it is important to prevent oxaliplatin-associated SI. Some authors have reported the administration of aspirin appears to be associated with a reduced risk of SI in patients treated by oxaliplatin-based chemotherapy. However, the effect of antithrombotic agents such as aspirin on the development of oxaliplatin-associated SI in CRLM remains unclear. The aim of this study was to clarify the effect of antithrombotic agents on the development of oxaliplatin-associated SI in CRLM cases.

**Methods:** Sixty-four patients undergoing liver resection for CRLM after receiving oxaliplatin-based chemotherapy (OBC) were studied. They underwent pathological assessments to clarify the degree of histopathological liver injury of the nontumoral liver parenchyma. We divided the patients into a group taking antithrombotic agents and a group not taking antithrombotic agents according to their concomitant medications for comorbidity.

**Results:** The median number of OBC cycles was 5.0 and the duration of chemotherapy cessation was 7 weeks. SI was observed in 18 of 64 patients (28.1%). Seven patients (10.9%) received chemotherapy with the antithrombotic agents. No significant differences were observed between the two groups regarding preoperative characteristics, blood test findings, the number of OBC cycles and the duration of OBC cessation. There were also no significant differences between the two groups regarding sinusoidal injury after OBC (p = 0.305). A multivariate analysis thus did not reveal that antithrombotic agents reduced the risk for SI after OBC.

**Conclusions:** Our findings therefore do not demonstrate that antithrombotic agents have a protective effect on oxaliplatin-associated SI in CRLM.

**Keywords:** Oxaliplatin, Sinusoidal injury, Colorectal liver metastasis, Antithrombotic agents.
PP3-097
Evaluation of Endostar Combined with Interventional Therapy for Treatment of Gastrointestinal Tumors Hepatic Metastasis by Dynamic MR Imaging

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Objective: Gastrointestinal tumors is a common malignant tumor with significant morbidity in China. Because of the low rate of early diagnosis, most patients with hepatic metastasis had poor prognosis. Interventional therapy became the treatment of first choice in unresectable cases, and anti-angiogenesis therapy to be a new way of tumor therapy. The aim of our study was to explore the value of Endostar combined with interventional therapy in gastrointestinal tumors hepatic metastasis by Dynamic MR Imaging.

Methods: A total of 22 histologically proven gastrointestinal cancer patients, who had found hepatic metastases after radical resection of primary tumor, were treated with Endostar combined interventional therapy. Patients received a combination of intravenous Endostar (15 mg) on days 1–5, and intraarterial Epirubicin (20–30 mg), Tegafur (1.0 g) and Oxaliplatin (85 mg/m²) on day 6 in every mouth. After three cycles of combined treatment, evaluated clinical curative effect by the change of tumor morphology and tumor markers in patients, observed toxicity and quality of life in patients during clinical follow-up.

Results: All patients finished three cycles of chemotherapy. The overall response rate was 59.09% (13 cases), in which 3 cases of patients (13.64%) had clinical complete response. Areas of necrosis and cavitation may occur within the tumor. Toxicity was moderate, and there were no chemotherapy-related deaths. KPS scores in patients were significantly improved. The DCE-MRI characteristics dramatic decline and the losses of Ktrans, Ve and iAUC were significances in statistics.

Conclusion: Preliminary results proved the Endostar combined interventional therapy was a safe and promising regimen for treatment of gastrointestinal tumors hepatic metastasis, can inhibit the growth of tumors and induce tumor necrosis, the quality of life in patients was significantly improved, DCE-MRI may play an important part in evaluating the effect of anti-angiogenic.

Keywords: Gastrointestinal tumors, Hepatic metastasis, Interventional therapy, Targeted therapy, Perfusion-weighted magnetic resonance imaging.

PP3-098
Challenges for Liver Transplantation in Developing Country (Mongolia)

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Liver transplantation (LT) is a main treatment of end-stage liver disease. Specially developing country like Mongolia has high prevalence of HBV, and hepatocellular cancer. The inception and setting up of LT project in the developing country is associated with some difficulties, which includes financial costs of liver transplantation, lifelong follow-up, treatment and insurance problems of patient. Fortunately, Mongolia had found a huge chance to develop the big project, that started since 2011. The cooperation of LT project between Mongolian First Central Hospital and ASAN Medical Center, nowadays project is going successfully. There 27 cases of LT had done by mixed team, and 4 cases had done by Mongolian team separately. There 30 cases were living donor liver transplantation, only 1 case was deceased donor liver transplantation. There were not donor’s mortality in 31 cases. In our 31 cases 2 recipients deaths, one of them CMV, which could not diagnosed in Mongolia. We faced with some complications, which includes acute rejection, infection and IVC stenosis.

Conclusion: Developing country like Mongolia faced with a lot difficulties to locate the expensive and difficult operation like LDLT. To do everything is a possible, the main thing is find the right way and good people for encourage the big project.

PP3-099
Predictors of Survival after Adult to Adult Living Donor Liver Transplantation (A-A LDLT)

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Overall, the accurate survival rate of recipients at, 6 months, 1, 3, 5 and 7 years was 67.7%, 63.4%, 59.0%, 58.4% and 57.1% respectively. On univariate analysis, the following factors were significant predictors of survival, male recipients, Actual GRWR >0.8, right lobe graft, blood transfusion <10 units and ab-
sence of vascular complications. On multivariate analysis, male recipients, blood transfusion >10 units and absence of vascular complications were independent predictors.

Conclusions: The reduction of intraoperative RBC, prevention and treatment of vascular complications, selection (GRWR >0.8, right lobe graft and male recipients) are required to achieve better survivals among patients undergoing A-A LDLT.

Keywords: Living donor liver transplantation, Outcome post LDLT, Vascular complications.

PP3-100
Pattern of Hepatocellular Carcinoma Recurrence Following Living Donor Liver Transplantation
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Background: Living donor liver transplantation (LDLT) is a promising treatment option for patients with hepatocellular carcinoma (HCC), but tumor recurrence can affect long term survival.

Objective: Is to identify the pattern of HCC recurrence after LDLT for early detection and management.

Methods: From April 2003 to October 2014, the record of 60 patients underwent LDLT for HCC at National Liver Institute (NLI), Menoufia University, Egypt, were retrospectively reviewed. The clinico-pathological data were analyzed to determine factors associated with HCC recurrence and outcome.

Results: Seven (11.7%) patients had HCC recurrence after LDLT. Pre-transplant Alfa-fetoprotein (AFP) > 1000 ng/ml, tumor grade, and microvascular invasion were the incriminated risk factors for recurrence. Three (42.8%) patients had intrahepatic and extrahepatic recurrence (lung and bone), 2 (28.6%) patients had only extrahepatic recurrence in bones, and 2 (28.6%) patient had only intrahepatic recurrence. Management was as follow; 2 (28.6%) patients had surgical excision of intrahepatic recurrence and extrahepatic metastasis, 2 (28.6%) patients underwent radiotherapy for bone metastasis, and 2 (28.6%) patients received Sorafenib as medical treatment. The mean time of recurrence was 19.7 months, and mean survival was 29 months.

Conclusion: The majority of HCC recurrences after LDLT occur extrahepatic, mainly in first 2 years, which needs strict follow up during this period. A high level of pretransplant serum AFP, and microvascular invasion are risk factors for tumor recurrence, and should be taken into account in selecting candidates for LDLT.

Keywords: Liver transplantation, Hepatocellular carcinoma, Alfa-fetoprotein, Recurrence.

PP3-101
Predictors of Outcome of Living Donor Liver Transplantation for Hepatocellular Carcinoma
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Background: The aim of this work is to study the different factors that affect the outcome of living donor liver transplantation for patients with HCC.

Methods: Between April 2003 to November 2015, 62 patients with liver cirrhosis and HCC underwent living donor liver transplantation (LDLT) in the National Liver Institute, Menoufia University, Egypt. The preoperative, operative, and postoperative data were analyzed.

Results: After studying the pathology of explanted liver; 44 (71%) patients were within Milan criteria, and 18 (29%) patients were beyond Milan; 13 (21.7%) of patients beyond Milan criteria were also beyond UCSF criteria. Preoperative ablative therapy for HCC was done in 22 patients (35.5%), 4 patients had complete ablation with no residual tumor tissues. Microvascular invasion was present in 10 patients (16%) in histopathological study. Seven (11.3%) patients had recurrent HCC post transplantation. The 1, 3, 5 years total survival was 88.7%, 77.9%, 67.2% respectively, while, the tumor free survival was 87.3%, 82.5%, 77.6% respectively.

Conclusions: Expansion of selection criteria beyond Milan and UCSF, had no increased risk effect on recurrence of HCC, but had less survival rate than patients within Milan criteria. Microvascular invasion was an independent risk factor for tumor recurrence.

Keywords: Hepatocellular carcinoma, Living donor liver transplantation, Milan criteria, Survival, Recurrence.

PP3-102
Topical Bee Honey for Severely Infected Perineal and Episiotomy Wounds
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The Aim of the Study: To evaluate therapeutic efficacy of topical honey as wound dressing in cases of perennial infections following gynecologic surgeries and episiotomies.

Subjects and Methods: Sixty-one patients with either post-perinatal repair or post-episotomy severe wound infections have been recruited and allocated in two groups.
Group I (31) received crude Egyptian bee honey applications, and Group II (30) had local antiseptics. Both groups have got systemic antibiotics. The honey amount: depended on amount of exudate; in general 10 cc for a 5-cm dressing, twice daily as beginning; if sticky: more, if gapped: filled with honey before applying the dressing pad, peri-wound inflamed area: included in the dressing, occlusive secondary dressing applied to prevent ooze.

Results:
1. infection data:
   1) same general (fever and malaise) and local (pain, tenderness, hotness and discharge) symptoms in the 2 groups,
   2) onset of infection: 3-days in group I and 2–99 days in Group II,
   3) bacterial isolates: staph., strept, Pseudomonas spp, E. coli, bacteroides and clostridia in the 2 groups,
   4) antimicrobial used: the same for the 2 groups: Gentamycin, flucloxacillin, metronidazole, tobramycin and clindamycin
2. cure responses of the 2 groups: Group I has shown:
   a) faster wound healing (11.8 days versus 24.7; P, <0.001;
   b) shorter hospital stay (6.5 vs. 12, 2 days, P < 0.01);
   c) less need for secondary intervention (3 secondary stitches vs. 8, P < 0.001);
   d) faster bacteriologic cure (6.5 DAYS VS. 17.7; P<.001).

Conclusion: Honey is a very effective and inexpensive treatment for severe perennial wound sepsis.

PP3-103
Mean Platelet Volume (MPV) as a Predictor of Venous Thromboembolism (VTE) in Colorectal Cancer

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Background: MPV, CBC-parameter, is potential biomarker of platelet activity in cancer and VTE. However, recent CATS-study showed that high-MPV levels associated with a decreased VTE risk.

Aim: To investigate the role of MPV in VTE and colorectal-cancer.

Methods: A retrospective study was performed to analyze differences of MPV between patients with VTE, VTE and colorectal-cancer, and control.

Results: Among 170 patients, 58-control, 54-VTE, and 58-VTE with colorectal-cancer, MPV was significantly higher in VTE groups (table 1). From 403 articles, 10 studies (5 cohorts and 5 case-controls) comprising 2,265 patients. MPV was significantly higher in those with VTE (mean difference 0.61 fL, 95% CI 0.34–0.88, P < 0.001). Elevated MPV increased the relative risk of VTE (RR 1.319, 1.061–1.641, I2 = 82.5%).

Conclusions: Our evidence suggests that elevated MPV is associated with VTE and VTE with colorectal-cancer. A mechanistic study and RCT are required in order to use antiplatelet therapy.

Keywords: Deep vein thrombosis, Pulmonary embolism, Complication.

Table 1. (for Abstract PP3-103)

<table>
<thead>
<tr>
<th>Mean platelet volume (fL)</th>
<th>p value</th>
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<tbody>
<tr>
<td>Control-varicose veins vs. VTE = 7.0±0.6 vs. 8.2±1.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Control-varicose veins vs. VTE with cancer = 7.0±0.6 vs. 9.0±0.9</td>
<td>&lt;0.001</td>
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<tr>
<td>VTE vs. VTE with cancer = 8.2±1.0 vs. 9.0±0.9</td>
<td>0.04</td>
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PP3-104
Surgical Outcome of Gastrointestinal Lymphoma: Experience from a Tertiary Care Center of North India

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Gastrointestinal tract is most common site of extra nodal involvement by lymphoma, majority being non-Hodgkin type. Here we present our experience of surgical outcome of gastrointestinal lymphoma presented to our department from January 2003 to December 2011.

A retrospective analysis of prospectively maintained database was made. In nine years, a total of 48 patients were treated of which 37 were males and 11 females (M:F was 3.5:1) with median age of 46 years. Median duration of symptoms was of 8.4 months. Most common presenting symptom was abdominal pain. Anorexia and weight loss was present in 3/4th of the patients and half of patients had anemia at presentation along with abdominal lump. Stomach was most common site followed by ileum, colon and jejunum. Eighty-seven percent patients underwent surgical resection and 57% underwent R0 resection.

The Overall morbidity was 18.8%. Most common was intraabdominal collection (12.2%), followed by anastomotic leak (7.5%) and postoperative bleed (5%). Median post-op stay was 7.5 days. Mortality was 12.8%. Most common type was high grade B cell Non Hodgkins Lymphoma (92%).85% had B cell origin 5% had T cell origin and combined B&T cell origin was
PP3-105
Retrospective Study of Hirschprung’s Disease: 10 Year Data from Largest Tertiary Care Hospital of Central India
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Background: A surgical audit of neonatal surgical diseases especially GIT disorders special reference to hirschprung’s disease.

Methods: A retrospective (2004–2013) and prospective (2014–2015) audit of newborn with surgical diseases especially GIT disorders hirschprung’s disease admitted in a tertiary care center of central India. The trends analyzed for the duration on gender, region and birth weight basis. A data base was generated depicting the burden of disease in the region. The data base for the prospective study was also compared with a tertiary center from the country & overseas.

Results: Total 3309 admission included 73.56% (2438) patients of GIT diseases In which 92 patients suffered from hirschprung’s disease. In this series 39 surgeries were performed and 9 mortalities were reported during this audit year 2004 to July 2014 – July 2015. Majority of new born admitted with were low birth weight male from rural skirts of this region.

Conclusions: There is significant increase in admissions in last decade with triple fold increase in GIT disorders and substantially increasing onwards. Hirschprung’s disease contributes to the GIT disorders category & surgical intervention significantly affects the outcome in this disease. There is ample scope to achieve further parity with international standards. Early recognition, risk stratification of the baby and timely referral to higher paediatric surgery units is the way forward.

PP3-106
Pilonidal Sinus Excision: New Vision
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Background: Pilonidal sinus is chronic inflammatory condition that usually affects young adults, despite of the current advances in the field of medical research the best approach in managing Pilonidal sinus disease is not yet well defined. This study aims to evaluate a new technique for the excision of pilonidal sinus and investigates its effectiveness in terms of operation time, healing time, and the duration of hospitalization, the degree of postoperative complications and rate of recurrence.

Methods: One hundred patients (93 males and 7 females) suffering from uncomplicated pilonidal sinus disease, underwent this new technique for pilonidal sinus excision. This technique based on lay open all visualized main and sides tracks of the sinus followed by excision of the whole area and closing underneath fascia and subcutaneous tissue.

Results: The mean duration of intervention was 40 minutes and patients were discharged one day after the operation. The mean time for recovery and return to normal physical activity was 12 days (There were no intraoperative complications or mortalities in all cases). Minor wound infection was the most common complication found as it occurred in 15 cases. Only 3 out of the 100 cases had recurrence. Finally, the overall patient satisfaction was more than 95%.

Conclusion: From our experience, this technique possesses all the criteria for ideal pilonidal sinus surgery as it is associated with short hospital stay, fast wound healing, low recurrence rate and minimal complications.

Keywords: Pilonidal sinus.

PP3-107
Improved Outcome of Emergent Management of Incarcerated Para-Umbilical Hernia in Patients with Decompensated Cirrhosis Under Local Anesthesia and Weak Sedation: A Prospective Randomized Comparative Study
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Background: Incarcerated umbilical hernia in such patients carries a significant risk of mortality if not managed rapidly. The goal of this study is to assess the feasibility and effectiveness of emergent management of PUH under local anesthesia.

Methods: From January 2014 to June 2015 (18 month) 90 cirrhotic patients with complicated PUH admitted and managed for emergent PUH repair at national liver institute, Menoufeya Uni-
versity. The 90 patient involved in this study were prospectively randomized during the management (as regard the used type of anesthesia) to either: receiving a general anesthesia (group 1), local anesthesia (group 2) or local anesthesia with light sedation (group 3) using simple random sampling technique. The three groups were compared as regard preoperative preparation difficulties, waiting time till operation, operative difficulties, operative pain, operative time, need for ICU admission, length of hospital stay (LOHS) and post operative general and local complication.

Results: Group 2 and 3 showed less preparation and operative difficulties than group 1. Both groups 2 and 3 were lower operative time, less ICU admission rate, less LOHS, general complication rate and strangulation rate. Both 2 & 3 groups showed significant decrease in waiting time before management and rate of general complication in comparison to group 1. Group 3 has better patient compliance and showed less operative difficulty.

Conclusions: Emergent repair of incarcerated PUH in patients with decompensated liver cirrhosis under local anesthesia with weak sedation showed significant and obvious improve in outcome and it should be the technique of choice.

Keywords: Incarcerated umbilical hernia, Local anesthesia, Decompensated liver cirrhosis.

PP3-108

The Novel Imaging of Colon Mucosa 3D Using Multiphoton Microscopy

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Background and Aim: During recent years, multiphoton microscopy became one of the most important optical imaging techniques for in vivo basic research. Multiphoton microscopy (MPM) can allow a detailed 3D structure analysis of tissue and can be used for the early diagnosis of dysplastic mucosal lesion. The aim of this study was to make the gastrointestinal mucosa 3D structure using DNA probe of multiphoton microscopy and to compare normal mucosa with adenoma and adenocarcinoma tissues.

Methods: This study was a single center study during Jury to September 2013. We obtained normal, adenoma and adenocarcinoma colon tissue samples by biopsy or endoscopic mucosal resection during colonoscopy from 7 patients. Then the tissues were placed in sterile specimen bottles containing PBS (phosphate buffer solution). Multiphoton images were collected using a DM IRE2 Microscope (Leica Microsystems GmbH, Wetzlar, Germany).

Result: Total 7 Patient was composed of 4 adenoma and 7 adenocarcinoma. Among them, 4 patients were diagnosed adenoma and adenocarcinoma at the same time. We were able to get 3D structural images at depths of 90–140 μm. Normal tissue had a defined texture, whereas adenoma and cancer tissue was amorphous. And cancer tissues increased nucleus/cytoplasm ratio compared to normal mucosa.

Conclusions: Colon mucosa 3D structure analysis using multiphoton microscopy can be successfully used to determine colon mucosa architecture and may help to diagnose early colon cancer together with histopathologic examination.

Keywords: Multiphoton microscopy, Colon cancer.

PP3-109

Feasibility and Safety Using the ICG Fluorescence Cholangiography in Laparoscopic Cholecystectomy and Deroofing for Liver Cyst

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Indocyanine green (ICG) fluorescence imaging navigation has played an important role in hepatobiliary surgery. It has been widely used as a navigation tool to identify biological structures such as cancerous tissues, sentinel lymph nodes, and cholangiography. We report feasibility and safety using the ICG fluorescence cholangiography for laparoscopic cholecystectomy and deroofing in symptomatic huge liver cyst.

2.5 mg of ICG was administered intravenously just before operation and the bile duct was observed using KARL STORZ laparoscopic ICG navigation system. It was resulting in rapid identification of the biliary system anatomy.

ICG fluorescent cholangiography clearly showed the cystic duct (79.8%) and CBD (90.6%) in cholecystectomy patients. Visualization of the CBD and cystic duct was considered to be very useful in the identification to the bile duct anatomy and prevention of the CBD injury.

Intrahepatic bile ducts can be clearly confirmed intraoperatively in laparoscopic deroofing for the liver cyst. No adverse reactions to the ICG were encountered. ICG fluorescent cholangiography intraoperative navigation is a safe and effective procedure. In addition, it is also possible for confirmation of bile leakage.

Keywords: ICG cholecystectomy deroofing.

PP3-110

The Small Y-Shaped Self-Expandable Airway Covered Metallic Stent in the Palliative Treatment of Thoracostomach-Right Main Bronchus Fistula Following Esophagectomy

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Background: Thoracostomach main bronchus fistula following esophagectomy are a clinical challenge because of the current therapeutic approach and the poor prognosis. In recent years, self-
expandable covered metallic stents have proven more effective for palliation of thoracostomach main bronchus fistula, with the small Y-Shaped self-expandable airway covered metallic stent technique registering a high success rate. We investigated its clinical efficacy through a review of patients with thoracostomach-right main bronchus fistula who underwent small Y-shaped self-expandable covered metallic stent placement.

**Aim:** We report our experience with small Y-shaped self-expandable covered metallic stents placement for treatment of thoracostomach-right main bronchus fistula.

**Materials and Methods:** From April 2013 to April 2014, we prospectively collected data on patients with Y-shaped self-expandable covered metallic stent placement for thoracostomach-right main bronchus fistula. According the diameter and length of airway, we individually designed the small Y-shaped covered stent in treatment of 7 cases of thoracostomach-right main bronchus fistula. The stent's diameter and length of right main bronchus were 14–18 mm×10–15 mm. The stent’s diameter and length of right upper lobe bronchus were 10–12 mm×10 mm. The stent’s diameter and length of right intermediate bronchus were 12–16 mm×10–15 mm. Data on technical success, clinical success, and complications were collected.

**Results:** Seven patients (5 males) were treated (mean age 55.3 ± 12.5 years). Technical success was achieved in all patients. Airway angiography after stent placement immediately showed that all fistulas were closed completely. Chest MSCT and bronchoscopy after stent placement showed that all stents were expansion, fistula were closed completely. All patients resumed oral intake. No severe intra- or postoperative complications occurred. No stents migration was recorded.

**Conclusions:** Our experience confirms the small Y-shaped self-expandable airway covered metallic stent placement under DSA guiding as a feasible, effective, and safe procedure for thoracostomach-right main bronchus fistula following esophagectomy.

**Keywords:** Stent, Fistula, Thoracostomach, Esophagectomy.

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**PP3-111**

**New Insights in Treatment of Extravascular Compression of a Celiac Axis**

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Hospital Surgery, Altay State Medical University, Russian Federation

**Aims:** We studied a pathophysiology of a celiac axis syndrome and treatment aiming at correcting compression of the celiac axis.

**Methods:** We analyzed the results of surgical treatment of 78 patients with compression of the celiac axis. The diagnosis was based on clinical symptoms, a duplex ultrasonography of the celiac axis on inspiration and expiration, CT-scan with contrast.

**Results:** Ischemia was observed in only 16 patients (20.5%) with stenosis of 70%. Milder compression was related to phases of respiration and ranged between 40% and 70% in all other patients. Celiac axis compression was associated with the following conditions: 8 chronic pancreatitis, 38 duodenal ulcer, and 32 gastro-duodenal hypokinesia.

All patients were submitted to decompression of the celiac axis by section of the median arcuate ligament and 65 patients underwent additional excision of nervous fibers. Selective proximal vagotomy was performed on patients with duodenal ulcer. No pancreatic intervention was performed.

Research of resected tissues showed ganglio-neuritis with perineural fibrosis of 8 (10%) patients in a combination with chronic pancreatitis. Signs of a perineural inflammatory infiltration are revealed at other patients. Mortality after operations was 0. In the postoperative period we observed resistant hypokinesia of a stomach at patients in combination with duodenal ulcers. 45 (57%) patients had hypokinesia of a stomach and a small intestine that belongs to Grade I on Dindo-Clavien’s classification.

Control of 39 patients 3 years after surgery gave excellent results for 5 (12.8%), good for 23 (59%) and satisfactory for 11 (28.2%) patients.

**Conclusion:** We hypothesize that irritation of the nervous fibers of the plexus may be the cause of symptoms in most cases while ischemia occurs in a minority of cases.

**Keywords:** Extravascular compression of a celiac axis, Celiac axis syndrome, Ganglio-neuritis.

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**PP3-112**

**Breast Cancer in Sudan: Ten Years Survival Rate in a Series of 420 Patients**

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**Breast Cancer In Sudan:** Ten Years Survival Rate In A series Of 420 Patients. The incidence of breast cancer in Sudan is increasing. Presentation was late in the past but now early disease is seen in most of breast clinic. Prognosis is hence improving. In this paper 10 years survival rate and achievement of the patients is going to be discussed.

**Keywords:** Breast cancer, 10 year survival, Sudan.

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**PP3-113**

**Outpatient Varicocelectomy Under Local Anaesthetic in Sudan**

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**Introduction:** The most common cause of subfertiliy in males is varicocele. A very simple cheap procedure is performed for varicocele correction.

**Objective:** To evaluate the outcome of this simple procedure in Sudan.

**Patients and Methods:** Prospectively 700 patients with varicocele coming to Andrology clinic were enrolled in the study. Outpatient varicocelectomy under local anaesthetic was performed for...
all patients. They were followed for one to ten years for improvement of semen parameters conception or complications. The total cost of the operation was only 45 USD.

**Keywords:** Varicocele, Varicocelectomy, Local anaesthesia.

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**PP3-114**

**Perforations Caused by Endoscopic Resection: When Should We Perform Surgery?**

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**Background:** Endoscopic resection (ER) is commonly performed to treat gastric epithelial neoplasms and subepithelial tumors. The most serious complication for ER is perforation. Although most cases of perforation induced by ER can be controlled with conservative care, surgery is occasionally needed. The aim of this study was to predict the risk factors for surgery after ER-induced perforation.

**Methods:** We retrospectively reviewed the data on patients who received gastric endoscopic submucosal dissection (ESD) or endoscopic mucosal resection (EMR) between January 2010 and March 2015. Patients who were confirmed to have perforation were classified into surgery and non-surgery groups. We aimed to determine the risk factors for surgery in patients who developed iatrogenic gastric perforations.

**Results:** A total of 1183 patients underwent ESD or EMR for gastric epithelial neoplasms and gastric subepithelial tumors. ESD was performed in 425 patients, and EMR was performed in 758 patients. Perforation occurred in 69 (5.8%) patients, and 9 patients (0.8%) required surgery to manage the perforation. In univariate analysis, anterior location of the lesion, a subepithelial lesion, two or more post-procedure pain killers within 24 hrs and increased heart rate within 24 hrs after the procedure were the factors related to surgery. In logistic regression analysis, the location of the lesion at the anterior wall and using two or more post-procedure pain killers within 24 hrs were risk factors for surgery.

**Conclusions:** Most cases of perforations after ER can be managed conservatively. When a patient requires two or more post-procedure pain killers within 24 hrs and the lesion is located on the anterior wall, early surgery should be considered instead of conservative management.

**Keywords:** Gastric perforation, ESD, EMR and surgery.

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**PP3-115**

**Clinical Outcomes of Endoscopic Submucosal Dissection (ESD) in Patients with Early Gastric Cancer Beyond Preoperative Indication of ESD**

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**Introduction:** ESD can be chosen as an initial treatment modality instead of surgery in patients with EGC beyond preoperative indication of ESD, especially if patients hesitate or refuse surgery.

**Aims and Methods:** The aim of this study was to identify the outcomes of ESD in patients with EGCs not meeting preoperative indication of ESD. We reviewed the medical records of patients who underwent ESD between January 2011 and December 2015, at a single institution.

**Results:** A total of 222 patients underwent ESD for EGC lesions that were beyond preoperative indication of ESD with curative or diagnostic intent. They were classified 5 beyond preoperative indication groups according to the guideline of the Japan Gastroenterological Endoscopy Society: (1) differentiated histology, UL (–), cT1a, >30 mm; (2) differentiated histology, cT1b; (3) undifferentiated histology, UL (–), cT1a, >20 mm; (4) undifferentiated histology, cT1a, UL (+); (5) undifferentiated histology, cT1b.

En-bloc resection rate and complete resection rate were 98.2% (116/222) and 84.7% (188/222). Lymphovascular infiltration was shown in 40 lesions (18.0%). Less than half lesions met none of the absolute or expanded indication of ESD (33.8% [75/222]). As a result, 147 patients (59.9%) underwent curative ESD. Of 133 patients with curative resection, 76 lesions (57.14%) met absolute indication and 57 lesions (42.86%) met expanded indication of ESD.

Among the tumor-related factors of the curability, multivariate analysis revealed lesions with larger size (OR: 1.062; 95% CI: 1.015–1.112; P-value: 0.009) and undifferentiated histology (OR: 5.167; 95% CI: 1.768–15.103; P-value: 0.003) were risk factors in non-curative resection.

**Conclusions:** Even though lesions were regarded as beyond indication of ESD on preoperative evaluation, curative resection could be achieved and surgery was avoided in a considerable numbers of patients. Preemptive ESD can be considerable prior to surgery in patients with EGC beyond preoperative indication of ESD.

**Keywords:** Beyond indication, Early gastric cancer, Endoscopic submucosal dissection.
**PP3-116**

**Diagnostic Yield of Endoscopic Ultrasonography Guided Single-Incision Needle Knife Biopsy for Gastric Subepithelial Tumors; Comparison with Resected Specimens**

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**Background:** Several techniques are recommended for the histologic diagnosis of gastric subepithelial tumors (SETs). The purpose of our study was to evaluate the diagnostic yield and safety of endoscopic ultrasonography guided single-incision needle knife (SINK) biopsy for the diagnosis of gastric SETs.

**Methods:** A retrospective review of patients who received biopsy for gastric SETs from August 2012 to May 2015 was conducted. Patients who received endoscopic ultrasonography and were found to have a SET originating from the muscularis propria of the stomach were included in the study. The aim of our study was to investigate the safety and diagnostic yield of SINK biopsy for gastric SETs.

**Results:** A total of 31 patients received SINK biopsy for SETs. The diagnostic yield of SINK biopsy was 87% (95% CI 75% to 100%) and the diagnostic accuracy was 89% (95% CI 74% to 105%). The sensitivity of SINK biopsy to identify gastrointestinal stromal tumors was 83% (95% CI 52% to 98%), but the specificity was 100% (95% CI 96% to 100%); the positive predictive value was 100% (95% CI 97% to 100%); and the negative predictive value was 78% (95% CI 59% to 100%).

**Conclusion:** The use of SINK biopsy technique in patients with SETs is a good diagnostic tool with high diagnostic yield and accuracy. The method is simple, safe, and associated with few complications.

**Keywords:** Subepithelial tumors, Biopsy, Endoscopy, Diagnostic techniques.

**PP3-117**

**Buried Clip with Healing Mucosa after Endoscopic Submucosal Dissection**

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**Background/Aims:** The hemostatic clips are used frequently for control bleeding at endoscopic intervention worldwide. It is a safe and confidential procedure for the endoscopic hemostasis. Even though some clips fixed and did not removed at the site of procedure for several years, the clips are generally detached spontaneously within 2 weeks of procedure at the site of apply and removed with fecal route. However, the clips buried with healing mucosa are very rare. In the present case, we encountered a patient with buried clip covered with healing mucosa at the post endoscopic submucosal dissection site.

**Case:** A 61-year-old man received routine follow-up endoscopy in November 2014. He had undergone endoscopic submucosal dissection for gastric adenoma in October 2011, when several metallic clips had been applied upon management of post endoscopic submucosal dissection ulce bleeding control. Upper endoscopy in November 2014 revealed a healed ulcer scar at the post endoscopic submucosal dissection site. During the biopsy, we stumbled upon buried clip at the endoscopic submucosal dissection ulcer site.

**Conclusion:** We herein present a rare case of buried clip in which fixed at the endoscopic submucosal dissection ulcer site and covered with healing mucosa. The clip discovered by chance with tissue biopsy at the endoscopic submucosal dissection ulcer site.

**Keywords:** Clip, Endoscopic submucosal dissection, Endoscopy.

**PP3-118**

**Clinical Impacts of Incisional Target Biopsy on Therapeutic Strategy for Proximal Gastric Pm Mass**

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**Introduction:** Differentiating GIST and leiomyoma among hypoechoic mass originating from muscularis propria is one of the most common challenging problem physicians face. Currently, endoscopic ultrasonography (EUS) is used to diagnose SETs and combined with EUS-guided fine-needle aspiration or EUS-guided trucut biopsy, but of a limited value. The aims of this study is to evaluate the prevalence of leiomyoma and gastrointestinal tumour and difference in prevalence of these tumors by location, especially in cardia and anatomical location near esophagus by means of incisional target biopsy (ITB).

**Method:** A total of 11 patients with SETs in the stomach were evaluated. ITB by endoscopy were done depend on size, layer of origin, and echogenic pattern of the lesion by EUS. All patients underwent incisional target biopsy and performed ESD technique with obtaining preoperative pathological diagnosis, in accordance with management protocol.

**Results:** The mean procedure time was 22.2 minutes. Three patients had a bleeding complication all of which managed successfully. Three patients were identified as having GIST, 8 patients as leiomyoma. All tumors identified as GIST or leiomyoma were located in upper 1/3 of stomach. All of GIST and leiomyoma were originated from muscularis propria. Mean distance from esophagogastroduodenal ulcer site was 3.70 cm and 3.54 cm for GIST and leiomyoma, respectively. All of GIST were homogenous, hypoechoic with capsulation. 4 of leiomyoma were homogenous and rest were heterogeneous and 2 of leiomyoma had lobulated margin.

**Conclusions:** ITB has been feasible, less invasive & the diagnostic option for hypoechoic pm mass lesions at proximal stomach, especially near cardia. ITB provide the correct differential diagnosis for malignant potencies out of pm masses of proximal stomach. So it is possible to avoid the adverse outcomes after invasive therapeutic procedure, especially proximal gastric area including car-
Abstracts

However, this study has a limitation of small study population, so large prospective study is needed.

**Keywords:** Subepithelial tumor, Incision biopsy, GIST, Leiomyoma.

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**PP3-119**  
**Quality of Life in Gastroesophageal Cancer Patients after Surgery**  
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**Introduction:** Quality of life measures are important as this data helps in efficient clinical decision making based on patients' experience during the course of illness. It also helps us in selection of optimal treatment type, surgery, psychosocial interventions, and allocation of resources. The purpose of this study was to assess the affect of surgery on the quality of life in gastroesophageal cancer patients.

**Material and Methods:** This study was conducted in outpatient department of Multan Institute of Nuclear Medicine and Radiotherapy using the brief version of World Health Organization Quality Of Life questionnaire (WHO QOL BREF). 70 patients with gastroesophageal cancer were included in the study and were divided into two groups on the basis of surgery.

**Results:** The gastroesophageal cancer patients who underwent surgery showed a significant improvement in the physical, psychological and social domains as well as the overall health related quality of life (p < 0.05). However, quality of life in one domain, the environmental domain, did not improve and even deteriorated in certain facets, including more negative feelings, worse financial situation and ability to participate in leisure and pastime activities.

**Conclusion:** The study demonstrated that gastroesophageal cancer patients experience a significant improvement in their quality of life after surgery. These findings are important in selection of treatment intervention for improving the quality of life of patients.

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**PP3-120**  
**Clinical Outcomes According to Conversion Surgery in Gastric Cancer Patients with Peritoneal Seeding**  
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**Purpose:** Peritoneal seeding of gastric cancer is known to have a poor prognosis. With the diagnosis of peritoneal seeding, there is no effective treatment modality. Gastrectomy with chemotherapy or primary chemotherapy is basically one of major options for this condition. This study intend to provide the clinical outcomes of the gastric cancer patients with peritoneal seeding who had conversion therapy.

**Materials and Methods:** Between 2003 and 2012, gastric cancer patients with peritoneal seeding by preoperative or intraoperative diagnosis were reviewed retrospectively. Clinicopathologic characteristics and clinical outcomes of peritoneal seeding patients were analyzed.

**Results:** 43 patients were enrolled. 18 patients belonged to the conversion surgery and 25 patients were to the continued conventional chemotherapy. Among 18 patients of the conversion surgery, 10 patients were received curative resection (R0). The median survival time of the curative resected conversion therapy patients was 30 months and non-curative resected patients was 18 months. But any chemotherapy group patients were not survived 3 year and the median survival time was 8 months.

**Conclusions:** In terms of survival benefits for the gastric cancer patients with peritoneal seeding, conversion surgery revealed the better clinical outcomes. But, prospective randomized clinical study and multi-center study should be performed to decide proper treatment for gastric cancer patients with peritoneal seeding.

**Keywords:** Gastric cancer, Peritoneal seeding, Chemotherapy, Gastrectomy.

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**PP3-121**  
**Gastric Cancer in Sudan: Presentation and Management**  
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**Introduction:** Gastric cancer is a dreadful killer worldwide. There is enormous variation on the occurrence of the disease throughout the world. Only scarce data is available about the features and the prognosis of the disease in Africa. This study was conducted to determine the clinicopathological characteristics and the treatment outcome of gastric malignancy in Sudan.

**Patients and Methods:** Prospective, descriptive study of 100 patients who presented with gastric malignancy to one unit over two years between March 2011–2013.

**Results:** The male: female ratio was 1:3. The mean duration of symptoms was 5.2 months. Advanced stage III and IV disease ac-
counted for 85% of the patients. The site where the tumors located were cardia 37%, body 26%, antrum and pylorus 24% and whole stomach in 13%. Resection was achieved in 71 patients; it was curative in 55 patient and palliative in 16 patients. Gastro-enterostomy, feeding jejunostomy and non therapeutic laparotomy was received by 13.3, and 7 patients respectively. Complication occurred in 9.2% and the 30 days mortality was 4.2%.

**Conclusion:** In Africa the majority of patients with gastric cancer presents with advanced stages. Due to lack of other palliative measures, surgery (even if palliative) remains an important available option of treatment.

**PP3-122**

Laparoscopic Repair of Morgagni Hernia: A Plea for Mesh Repair

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Morgagni’s hernias are secondary to congenital defects in the anterior diaphragm. The diaphragmatic defect described by both Morgagni and Larrey is a triangular space between the muscle fibers of the diaphragm that originates from the xiphisternum and the costal margin and inserts on to the central tendon of the diaphragm. The hernia sac frequently contains the transverse colon with the omentum; more rarely, the stomach, small bowel, or liver is involved.

The majority of the patients with Morgagni hernia are asymptomatic and diagnosis is usually made from routine chest X-ray. Some patients may present with nonspecific cardiac, respiratory, or gastrointestinal symptoms. Rarely, acute abdominal or thoracic symptoms caused by obstruction and strangulation of the bowel may lead to the presentation.

Traditionally the surgical management has involved an open transthoracic or transabdominal repair with suturing of the edge of the diaphragm to the retrosternal and retrocostal endothoracic fascia and/or posterior rectus sheath. These approaches can involve significant morbidity.

There is no consensus as to the optimum laparoscopic technique and various approaches have been reported. There are two issues to consider during the operation; the first is whether to remove the sac and the second is whether to use a mesh.

We believe that removal of the sac is not mandatory, while the use of mesh is mandatory. In view of the peculiar anatomy of the defect, suture repair is often difficult and is always done under a considerable amount of tension. Therefore, the use of mesh is essential for a tension-free repair.

**Keywords:** Morgagni, Hernia, Laparoscopic, Mesh, Repair.

**PP3-124**

Surgeon’s Experience Overrides the Effect of Hospital Volume for Postoperative Outcomes of Laparoscopic Surgery in Gastric Cancer: Multi-Institutional Study

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**Background:** Hospital volume is known to be a crucial factor in reducing postoperative morbidity and mortality in laparoscopic gastrectomy for gastric cancer. However, it is unclear whether surgeon’s individual experience can overcome the effect of hospital volume.

**Methods:** Clinicopathological data of initial 50 laparoscopic gastrectomy cases were collected from six gastric cancer surgeons. Half of the six surgeons worked in high-volume centers and the
other half worked in low-volume hospitals. Perioperative outcomes were compared between the high-volume centers and the low-volume hospitals.

Results: Three low-volume hospitals in this study contained significantly more male and older patients with a higher ASA score than high-volume centers. Although high- and low-volume hospitals mainly used laparoscopy-assisted and totally laparoscopic approach, respectively, there were no differences between the two groups in the extent of resection, operating time, estimated blood loss and the number of harvested lymph nodes. Postoperative recovery such as duration to soft diet and hospital stay did not differ between the high- and the low-volume hospitals. No significant difference was found in postoperative morbidity by Clavien-Dindo classification. There was no mortality reported in both groups of the enrolled hospitals.

Conclusions: Hospital volume is not a decisive factor in affecting postoperative morbidity and mortality for well-trained beginners in laparoscopic surgery for gastric cancer.

Keywords: Competence, High-volume hospitals, Laparoscopic surgery, Low-volume hospitals, Stomach neoplasm.

PP3-125
Large Amount of Surgical Drain Predicts the Postoperative Complication after Gastric Cancer Surgery
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Background: The fluid effused from the resection site is known to be related with postoperative outcome after gastric cancer surgery. We investigated whether the amount of fluid estimated by surgical drain is related to the postoperative complication.

Methods: We retrospectively reviewed 210 patients who underwent gastrectomy for gastric cancer at 2014 in a single institution. The summed amount of fluid drained from the 1st to 4th postoperative day was analyzed in relation to the other clinicopathological factors and the occurrence of severe complications (Clavien-Dindo grade III or more).

Results: The incidence of severe postoperative complications was 9.1% (19/210). Receiver operating characteristic analysis identified the drained fluid amount more than 1358 ml as the optimum value for severe complications (area under the curve = 0.67, sensitivity = 47.4%, and specificity = 86.9%). The >1358 ml group (n = 35) was significantly associated with total gastrectomy, longer operation time (>190 min), advanced T stage (3 or 4), retrieved lymph nodes (30 or more), and lymph node metastasis. Multivariable analysis revealed that the postoperative drain amount more than 1358 ml was an independent risk factor for severe complications. (Odds ratio 4.56, 95% CI 1.47–14.15; P = 0.009).

Conclusion: Large amount of surgical drain during early postoperative periods predicts the occurrence of severe postoperative complication.

Keywords: Gastric cancer surgery, Surgical drain, Postoperative complication.

PP3-126
HOXB7 Promotes Epithelial-Mesenchymal Transition and Metastasis in Gastric Cancer
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Backgrounds and Aims: HOXB7 has been researched to be highly expressed in primary or metastatic gastric cancer tissues. We aimed in this study to demonstrate the roles of HOXB7 in the development of epithelial-mesenchymal transition (EMT) and metastasis in gastric cancer using in vitro and in vivo model.

Material and Methods: We established HOXB7-expressing stable cell lines (MKN45-B7) and mock cells (MKN45-mock). Xenografts tumors were produced by using 6-week old male Balb/C nude mice (nu/nu). Tumors were extracted 4 weeks after injection, and were implanted on the stomach of another nude mice. 6 weeks after implantation, mice were sacrificed and their peritoneal metastasis, peri gastric lymph node and volume of gastric tumor were compared between both groups.

Results: MKN45-B7 cells frequently showed fibroblast-like mesenchymal phenotype, whereas most of MKN45-mock cells showed epithelial phenotype. Western blot showed that mesenchymal markers (snail, vimentin) were up-regulated and epithelial marker (E-cardherin) was down-regulated in MKN45-B7 cells, as well as phospho-Akt level was increased and PTEN was decreased. The volume of xenograft tumor was significantly increased in MKN45-B7-injected mice than MKN-mock injected mice, and mean number of peritoneal metastasis/peri gastric lymph node and volume of gastric tumor were also significantly increased in MKN45-B7 tumor-implemented mice. When we transiently transfected siAkt on MKN45-B7 cells, snail and vimentin expression were down-regulated, whereas E-cadherin expression was up-regulated, compared by siControl-transfected MKN-B7 cells.

Conclusion: Our findings suggest that HOXB7 may play crucial role in promoting EMT and metastasis via modulating PI3K/Akt pathway in gastric cancer.

Keywords: HOXB7, Gastric cancer, Epithelial-mesenchymal transition.
PP3-127
Assessment of Outcome of Repair of Perforated Peptic Ulcer by Modification of Graham Patch – A Clinical Study
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Background: Perforated peptic ulcer (PPU) is an important and relatively common acute surgical condition requiring emergency laparotomy and repair. Immediate post-operative complication of re-perforation, though rare, may occur after simple patch closure (Graham Patch).

Aim: To compare the incidence of immediate post-operative complication of re-perforation between the conventional Graham Patch repair and a modification of it, as proposed by us.

Methodology: Study has been a hospital-based prospective study with 60 patients undergoing emergency surgery for PPU, admitted in GMCH from May 2012 to August 2013.

Surgical repair of PPU was done in all the cases by 2 techniques (randomly allocated):
1. Graham Patch Technique (30 patients).
2. Modification of the Graham Patch technique (30 patients)

This modification eliminates the chance of necrosis of the omental patch, enclosed and strangulated inside the sutures; and the margins of the omental patch also covers up the unhealthy ‘cut-through’ ulcer margins (cut-through may occur due to the sutures cutting through the edematous edge and due to tightly placed ligatures) (fig. 1).

Result: 3 in the conventional repair by Graham Patch group developed re-perforation and 1 developed post-operative sub-diaphragmatic abscess, and none in the modified technique group had re-perforation (p > 0.05).

Conclusion: The new modified technique of repair of PPU appears to be associated with a reduced rate of immediate post-operative complication of re-perforation and also the complications associated with re-perforation. We do not expect this new technique to be affected by other factors like age, duration of perforation, co-morbid illnesses, size of perforation, etc any more than they affect the conventional Graham patch technique.

Keywords: Perforated peptic ulcer, Graham patch, Modified graham patch repair.

PP3-128
Exophytic Gastrointestinal Stromal Tumor of the Stomach with a Gastric Fistula Mimicking Perigastric Abscess
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Gastrointestinal stromal tumor (GIST) is the most common mesenchymal tumors of gastrointestinal tracts. GISTs grow in three forms: intramural, intraluminal, and exophytic. Clinical symptoms of GIST are variable: from asymptomatic to dyspepsia,
Peptic ulcer.

Esophagogastroduodenoscopic finding showed a fistula at greater curvature side of high body of the stomach, and yellowish materials were detected from the fistula. After laparoscopic wedge resection of stomach, the final diagnosis was CD117 positive GIST with exophytic growth which was communicating gastric lumen via fistula. We report a case of gastric GIST with exophytic growth which was communicating gastric lumen via fistula.

**Keywords:** Abscess, Fistula, Gastrointestinal stromal tumors, Peptic ulcer.

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**PP3-129**

**Use of Fascial Closure Needle versus Staples for Mesh Fixation in Laparoscopic Transabdominal Preperitoneal Hernioplasty**

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**Background:** Recently, it is being suggested in the literature that postoperative pain after TAPP is mostly attributed to the use of staples in mesh fixation. This study aims to compare the value and cost effectiveness of using facial closure needle versus the use of staples in the fixation of prosthetic meshes in laparoscopic inguinal hernia repair (TAPP).

**Methods:** Sixty male patients suffering from inguinal hernia with a mean age 22.7 years ranging from 18 to 30 years were enrolled in this study. Mesh fixation using fascial closure needle was done in 30 cases and using staples in another 30 cases. Full physical assessment for the patients was performed and any postoperative complications such as early or late postoperative pain or burning sensation, hyperesthesia, wound infection, seroma, hematoma or recurrence were recorded.

**Results:** The mean duration of intervention for fascial needle fixation cases was 43.4 minutes while for stapled cases the mean duration of intervention was 40 minutes. The mean recovery time to normal physical activity was 7.5 days for fascial needle fixation cases and was 9.1 for stapled cases. In stapled patients, one case of recurrence occurred, 2 cases showed hematoma and by the end of the 1st month after the operation, 2 cases had suffered lateral thigh pain, while at the end of the 6th month after the operation 5 cases had suffered chronic inguinal pain. In cases with fascial needle fixation no recurrence had occurred, while 1 case showed subcutaneous port hematoma and one case was reported with inguinal discomfort at the end of the 1st month after the operation and at the end of the 6th month after the operation, no cases had pain.

**Conclusion:** From the above results, we can conclude that the use of fascial needle closure for mesh fixation in TAPP is better than the use of staples, not only because it is associated with lower incidence of postoperative complications (i.e. postoperative pain and recurrence) but also because its associated with lower costs allowing better availability for all patients.

**Keywords:** Laparoscopic inguinal hernia repair (TAPP).

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**PP3-130**

**Risk of Pancreatitis and Post-Pancreatitis Adverse Events in Patients with Diabetes: Two Nationwide Retrospective Cohort Studies**

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**Background:** The association between diabetes and pancreatitis was not completely understood. This study evaluated pancreatitis risk and pos-pancreatitis outcome in patients with diabetes.

**Methods:** We identified 12747 adults aged 20 years and older with new-diagnosed diabetes and 50988 adults without diabetes in 2000–2003. Pancreatitis was identified as outcome during the follow-up period until 2008. Adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) of pancreatitis associated with diabetes were calculated. A nested cohort study was conducted included 19536 patients with hospitalization due to pancreatitis in 2004–2012. Adjusted odds ratios (ORs) and 95% CIs of outcomes after pancreatitis associated with previous diabetes were calculated in the multivariate logistic regressions.

**Results:** The incidences of pancreatitis during the follow-up period for people with and without diabetes were 1.06 and 0.58 per 1000 person-years, respectively. The adjusted HR of pancreatitis was 1.65 (CI 1.28–2.14) for people with diabetes compared with those who had no diabetes. In the nested cohort study, previous diabetes was associated with post-pancreatitis urinary tract infection (OR 1.43, 95% CI 1.24–1.66), admission to intensive care unit (OR 1.25, 95% CI 1.12–1.40), and mortality (OR 1.50, 95% CI 1.02–2.19).

**Conclusion:** Patients with diabetes had increased risk of pancreatitis compared with people without diabetes. Post-pancreatitis adverse events were also associated with previous diabetes.

**Keywords:** Diabetes, Pancreatitis, Risk, Adverse events.
VF01-1
Our Strategies for Minimizing Blood Loss in Right Anterior Sectionectomy for Hepatocellular Carcinoma
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Background/Aims: Right anterior sectionectomy for treatment of hepatocellular carcinoma (HCC) is one of the most technically difficult hepatectomies to perform.

Method: Our strategies: Prior to liver dissection, we place tapes at the infrahepatic IVC, the root of the right hepatic vein and the common trunk of the middle/left hepatic vein. If venous bleeding during liver dissection is obvious, we perform a half-clamp of the IVC. In addition, if bleeding from the exposed veins is difficult to control, we clamp each hepatic vein. From 1996–2015, 22 patients underwent right anterior sectionectomy for treatment of HCC. We divided these patients into two groups; the non-taping group (n = 11) and the taping group (n = 11). Surgical results of the two groups were compared.

Results: We, herein, present an operative video of a patient who underwent right anterior sectionectomy for treatment of HCC (Operating time: 4’45’’; Blood loss: 350 g). In the taping group, an IVC clamp was applied in 8 cases (73%), and a hepatic vein clamp was applied in six (55%). There were three cases (27%) in the taping group that did not require clamping. The operative time (397 vs. 272 minutes; p = 0.0028), blood loss (1218 vs. 428 g; p = 0.0004), and positive rate of blood transfusion (36 vs. 0%; p = 0.0111) were significantly reduced in the taping group. In addition, the morbidity rate (3 vs. 0 case; p = 0.0313) and duration of postoperative hospital stay (18 vs. 12 days; p = 0.0370) were significantly reduced in the taping group.

Conclusion: In right anterior sectionectomy for HCC, taping of inferior IVC and hepatic veins to prepare for massive bleeding at the cut liver surfaces before liver dissection is a promising procedure to minimize blood loss, and improve short-term surgical results.

Keywords: Right anterior sectionectomy, Hepatocellular carcinoma (HCC), Taping of inferior IVC and hepatic veins.

VF01-2
Modified Thoracoscopic Hepatectomy for Segment VIII
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Background: Although total thoracoscopic hepatectomy (TH) for malignant liver tumors have been reported, it is technically impossible to perform intraoperative ultrasonography (IUSO) to exclude intrahepatic metastasis for the whole liver via thoracic approach. We here report the first case of modified TH for a malignant liver tumor in China.

Methods: The patient was a 26-year-old man with a 10-year HBV infection. Preoperative CT showed a 1.2 cm×0.9 cm mass located in segment VIII. His alpha-fetal protein level was 444 ng/ml. Child-Pugh was Grade (A, 6), while an ICG-15 test yielded 2.7%. The indications for TH were difficult tumor location, HCC, and a young patient with good resilience.

Results: The modified TH included two steps: 1) The patient was placed in a supine position. IUSO was used to locate the tumor in segment VIII and determine that intrahepatic metastasis had not occurred. Pringle maneuver was prepared; 2) Patient was then placed in the left-lateral position with single-lung ventilation. Three trocars were placed into the right thoracic cavity. The intrathoracic space was observed using a regular 10 mm rigid scope. The diaphragm was transected and retracted. IUSO was used again to confirm the tumor location. Under Pringle maneuver (once, 10 minutes), the superficial tissue was transected by ultrasonic shears, while the deeper tissue was transected by LigaSure. Bipolar was used for hemostasis. The specimen was put into a retrieval bag and removed from the abdominal trocar. The diaphragm was repaired by running suturing. The operation time was 260 min and estimated blood loss was 30 ml. The patient was discharged on postoperative day 5 with normal liver function. No complications arose.

Conclusion: Total TH may be inappropriate for malignant liver tumors due to the limitation of IUSO for the whole liver. The modified TH is technically feasible and suitable for malignant liver tumors located in segments VII/VIII.

Keywords: Thoracoscopy, Laparoscopy, Hepatectomy.

VF01-3
Laparoscopic Liver Resection for the Tumors Located in the Posterior Section with Caudal Approach and Postural Changes
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During parenchymal transection of open liver resection (OLR) for the right dorsal liver, operator’s left hand is placed behind the liver after mobilization to compress and open the transection plane and as a guide for the transection direction. However, in laparo-
scopic liver resection (LLR), there is no ventral space for lifting the liver up. On the other hand, there are specific advantages of LLR. A good view from caudal/dorsal directions is acquired. Easy use of the postural change facilitates the dissection/mobilization and the acquisition of adequate operative fields by rolling away the organs with the gravity.

We performed 120 LLR. Among them, 25 were performed for the tumor in the posterior section. Caudal approach LLR using postural change with or without prior mobilization was applied to the cases except early cases. Recent cases with caudal approach LLR using postural change have shorter operating time and smaller amount of intraoperative bleeding compared with the earlier cases, significantly (336 ± 113 min and 243 ± 315 ml, p < 0.05).

For the posterior sectionectomy and the partial resection of large tumors in the posterior section, caudal approach LLR without prior mobilization can facilitate the good handling of the resected liver/tumor (attached to the retroperitoneum) and the residual liver (sinking down to the left with the gravity). The good view of the well-opened transection plane between them is acquired in semi-prone or left lateral position. This procedure could be also beneficial oncologically as the anterior approach in OLR. For the partial resection of deep small tumor in the posterior section, caudal approach LLR in semi-prone position with prior mobilization can make the good space above the resected liver, which is in the bottom of the operative field in supine position but on the top of the field in semi-prone position, for the stable operative procedures.

Keywords: Laparoscopic liver resection, Caudal approach, Left lateral position, Semi-prone position, Posterior section.

VF01-4
Simultaneous Laparoscopic Resection of Colorectal Cancer and Liver Metastases – Initial Experience
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Objectives: Synchronous liver metastases (SLMs) are found in 15%–25% of patients at the time of the presentation with colorectal cancer, which is limited to the liver in 30%. Surgical resection is the most effective and potential curative therapy for metastatic colorectal carcinoma (CRC) to the liver. Simultaneous resection of primary CRC and synchronous liver metastases is subject of debate with respect to morbidity in comparison to staged resection. Minimally invasive laparoscopic surgery improves postoperative recovery, diminishes postoperative pain, reduces wound infections, shortens hospitalization, and yields superior cosmetic results, without compromising oncological outcome. The aim of this study is therefore to evaluate our initial experiences of simultaneous laparoscopic resection of primary CRC and SLM.

Methods: Currently, laparoscopic resection of primary CRC is performed in more than 53% of all patients in our surgical department. 26 patients with primary CRC and a clinical diagnosis of SLM underwent combined laparoscopic colorectal and liver surgery. 6 of them underwent laparoscopic colorectal resection combined by major laparoscopic liver resection.

Results: Surgical approach was total laparoscopic (25 patients) or hand-assisted laparoscopic (1 patients). The incision created for the extraction of the specimen varied between 5 and 8 cm. Median operation time was 245 (range 150–320) minutes with a total blood loss of 600 (range 200–750) ml. Postoperative hospital stay was 7 day (5–12). An R0 resection was achieved in all patients.

Conclusions: Simultaneous laparoscopic colorectal and liver resection appears to be safe and feasible in selected patients with CRC and SLM, with satisfying short-term results.

Keywords: Simultaneous laparoscopic colorectal and liver resection, Colorectal cancer, Simultaneous colorectal liver metastases.

VF01-5
Laparoscopic Anatomical Hepatectomy of Segment 7 for Hepatocellular Carcinoma
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Background: Anatomical subsegmentectomy is one of the ideal treatments intended to cure hepatocellular carcinoma (HCC). We here report procedures of laparoscopic anatomical hepatectomy of segment 7, which utilize a unique laparoscopic caudodorsal view and intercostal trocars.

Methods: Patients were placed in a left semi-decubitus position. Three working trocars were placed along the line just beneath the right costal arch, and a trocar was placed through the 8th intercostal space on the right posterior axillary line. To control the bleeding, central venous pressure was maintained at a low level and Pringle’s maneuver was applied. After complete mobilization of the right lobe, the root of the right hepatic vein (RHV) was exposed. The Glissonian branch of segment 7 (G7) was identified on the posterior side of the RHV by ultrasonography. The liver parenchyma between segment 7 and 1 was divided first, and the G7 was isolated from the posterior side. By clamping the G7, a portion of the caudal border between segments 6 and 7 was opened along the demarcation line. And the G7 was divided at almost the origin. After that, the posterior aspect of the RHV was exposed from the vena cava side toward the periphery. The border between segments 7 and 8 was first opened from the caudal side, but then divided from the vena cava side toward the periphery at the final stage through the intercostal trocar placed at the 6th intercoast space.

Results: Between January 2008 and December 2015, we performed laparoscopic anatomical hepatectomy of segment 7 in 4 patients. The median operative time was 502 minutes with a median blood loss of 200g. The median length of postoperative hospital stay was 8.7 days.

Conclusion: By utilizing a unique laparoscopic caudodorsal view and intercostal trocars, laparoscopic hepatectomy of segment 7 can be performed safely and feasibly.

Keywords: Laparoscopic anatomical hepatectomy.
**VF01-7**

Validation of Difficulty Scoring System for Laparoscopic Liver Resection in Patients who Underwent Laparoscopic Left Lateral Sectionectomy

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**Background:** A difficulty scoring system (DSS) based on the extent of liver resection, tumor location, liver function, tumor size, and tumor proximity to major vessels, was recently developed to assess the difficulty of various laparoscopic liver resection procedures. We validated DSS in patients who underwent laparoscopic left lateral sectionectomy (LLS).

**Methods:** We reviewed the clinical data of 124 patients who underwent laparoscopic LLS between July 2003 and November 2015 and validated the DSS in 90 patients who underwent laparoscopic LLS for tumor according to their surgical outcomes. We also developed and evaluated the modified DSS in 34 patients who underwent LLS for intrahepatic duct (IHD) stones.

**Results:** The DSS score ranged from 3 to 6 in laparoscopic LLS for tumors. The median blood loss (P = 0.002) was significantly different among patients divided into subgroups by DSS score. We made modified DSS for IHD stones using factors influencing longer operation time, including stone location (P = 0.002), atrophy of liver parenchyma (P = 0.012), ductal stricture <1 cm from the bifurcation (P = 0.047), and combined choledochoscopic examination for remnant IHD (P < 0.001). The modified DSS score for IHD stones ranged from 3 to 7. Blood loss (P = 0.02) and operation time (P < 0.001) were significantly different among subgroups of patients divided by their difficulty scores. The median hospital stay (P = 0.004) and operation time (P = 0.039) were significantly longer and the complication rate (P = 0.025) and complication grade (P = 0.021) were significantly greater in patients with IHD stones than in patients with tumors.

**Conclusions:** The surgical difficulty varies among patients undergoing the same laparoscopic LLS procedure. The modified DSS developed here can also be applied to patients with IHD stones.

**VF01-6**

Laparoscopic Retropertitoneal Hepatectomy for a Subcapsular Hepatocellular Carcinoma

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A 48-year-old woman with a decade’s history of hepatitis B virus infection without cirrhosis came to our hospital for a further treatment of hepatic tumor. The abdominal computed tomographic scan demonstrated a solitary 2.0 × 2.0-cm lesion very close to adrenal gland at the segment VI of the liver, associated with a higher α-fetoprotein value (1254 ng/ml) and a Child-Pugh A score. The abdominal computed tomographic scan demonstrated a solitary 2.0 × 2.0-cm lesion very close to adrenal gland at the segment VI of the liver, associated with a higher α-fetoprotein value (1254 ng/ml) and a Child-Pugh A score. A pure laparoscopic retroperitoneal hepatectomy was performed by retroperitoneal access. The patient took the left-side-lying position. The laparoscopic camera inserted into the trocar located on the midaxillary line above the anterior superior spine about 3 cm. And the other two operation trocars located on the anterior and posterior axillary line. A 30-degree laparoscope was inserted and CO₂ gas insufflated until the retroperitoneal pressure reached 8 to 9 mm Hg. The tumor was sharply excised, and a drain was left in the flank. The operation time was 44 minutes, and the blood loss was 30 ml. In the present case, if conventional approach were developed here can also be applied to patients with IHD stones.

**Conclusions:** The surgical difficulty varies among patients undergoing the same laparoscopic LLS procedure. The modified DSS developed here can also be applied to patients with IHD stones.
VF01-9
Role of Intercostal Trocars on Laparoscopic Liver Resection for Tumors in Segments 7 and 8
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Introduction: Performing laparoscopic liver resection for lesions located in segment 7 and 8 is technically difficult, as the operative field is far from the conventional trocar site, and the liver impedes free motion of the laparoscopic instrument. Inserting the port through the intercostal space (ICS) may facilitate liver resection for these lesions.

Methods: From January 2012 to July 2013, five patients (four men and one woman) underwent laparoscopic S7 or 8 segmentectomy for liver metastasis and hepatocellular carcinoma (HCC). Ports were inserted at the 7th and 9th ICS, respectively, in addition to conventional abdominal ports.

Results: The mean age was 58 ± 10 (45–74) years; operation time, 197 ± 68 (110–300) minutes; blood loss, 161 ± 138 (40–320) ml; and length of hospital stay, 7 ± 3 (4–12) days. Pathologic findings revealed three, one, and one case(s) of colon cancer metastasis, breast cancer metastasis, and HCC, respectively. The mean tumor size and tumor-free margin were 2.2 ± 1.1 cm and 5.8 ± 1.9 mm, respectively. There were no postoperative complications.

Conclusion: Laparoscopic liver resection using intercostal trocars could be a useful method for tumors located in segments 7 and 8 of the liver in selected patients.

VF02-2
Non-Transthoracic Robot-Assisted Radical Esophagectomy
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Background: Surgical treatment is still main stream for esophageal cancer. In radical esophagectomy, three fields' lymph node dissection, cervical, mediastinal, and abdominal regions, is standard procedure. Frequent complications after radical esophagectomy are well known. Japanese nation-wide database (National Clinical Database) shows that 1/3 patients underwent the esophagectomy by MIE (minimally invasive esophagectomy), while the conventional open procedures were done among 2/3 patients. According to those results, the morbidity was significantly less in open group than MIE group (Ann Surg 2014;260:259–66). MIE was shown to fail to decrease the morbidity. Therefore, the prevention of post-operative complications, especially pneumonia, is most important issue yet.

Methods: With the aim of achieving lymph node dissection equivalent to the conventional procedure (open or VATS) and decreasing the development of post-operative pulmonary complications simultaneously, we developed the novel procedure, non-transthoracic radical esophagectomy by using da Vinci. It is the combination of transhiatal robotic manipulation for the middle and lower mediastinum and a video-assisted transcervical procedure for the upper mediastinum.

Results: That procedure has been performed in 52 cases with esophageal cancer, to date. No postoperative pneumonia occurred and the number of harvested mediastinal lymph nodes was equal to the conventional open surgery. Furthermore, the QOLs after surgery were observed to be better as compared to the conventional groups.
**Conclusions:** Non-transthoracic robot-assisted esophagectomy offers a new radical procedure for esophageal cancer.

**Keywords:** Esophagectomy, Minimally invasive surgery, Robot surgery.

**VF02-3**

**Laparoscopic Transhiatal Approach in the Treatment of Epiphrenic Esophageal Diverticulum: Step by Step**

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Epiphrenic esophageal diverticulum is a relatively rare disorder of the esophagus. This diverticulum is defined as mucosa and submucosa herniation through the muscular layers of the esophageal wall at the lower third of the esophagus. This disease is usually associated with underlying motility disorder of esophagus. The primary symptoms are dysphagia and regurgitation in the majority of patients. Symptomatic patients required surgical intervention. Standard treatment of the epiphrenic diverticulum includes diverticulectomy, esophageal myotomy, and fundoplication.

In this VDO, we describe a technique for laparoscopic diverticulectomy, heller myotomy, and Dor fundoplication. This video demonstrates a technique for operative field setup, port placement, and step of operation.

**Keywords:** Epiphrenic diverticulum, Laparoscopic, Diverticulectomy, Heller myotomy, Fundoplication.

**VF02-4**

**Laparoscopic Enucleation of Esophageal Leiomyoma in Distal Esophagus, Step by Step**

Rapheephat Tanomphetsanga, Jakrapan Wittayapairoch, Kongpon Tangpanitandee, Narong Boonyagard, Worawit Kattipatanapong, Krit Kitisin, Suppa-ut Pungpapong, Suthep Udomsawaengsup, Patpong Navicharern, Chadin Tharavej

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Esophageal leiomyoma, the most common benign esophageal mass, arise from smooth muscle in muscularis propria or muscular mucosa that usually locate in middle and lower third of esophagus. Frequently, the diagnosis is made incidentally on imaging or endoscopy for other indications. Laparoscopic enucleation of esophageal leiomyoma is the minimally invasive surgery and considered to be the standard procedure for tumor in lower esophagus. This video presentation demonstrate surgical technique of laparoscopic approach for enucleation in case of esophageal leiomyoma at distal esophagus.

**Keywords:** Laparoscopic enucleation, Esophageal leiomyoma.

**VF03-1**

**Kidney Autotransplantation for Renal Artery Aneurysm**

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Intraoperative fluorescent imaging using indocyanine green enables vascular surgeons to confirm the location and states of the reconstructed vessels during surgery. Complex renal artery aneurysm repair involving second order branch vessels has been performed with different techniques. We present a case of ex vivo repair and autotransplantation combining the advantages of minimally invasive surgery and indocyanine green enhanced fluorescence imaging to facilitate vascular anatomy recognition and visualization of organ reperfusion.

**Keywords:** Autotransplantation, ICG angiography.

**VF03-2**

**Successful Laparoscopic Common Bile Duct Exploration in a Patient with Previous Subtotal Gastrectomy**

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Previous gastrectomy can lead to an increased incidence of cholecystocholedocholithiasis and increased morbidity requiring operation. For the reason of rechannel of digestive tract, Endoscopic retrograde cholangiopancreatography (ERCP) tend to be difficult to performed successfully. Alternatively, Laparoscopic common bile duct exploration (LCBDE) can be performed in this kind of patients. We performed LCBDE successfully in a patient with previous subtotal gastrectomy in 23, March, 2016 and introduced the methods of preoperative evaluation and operative techniques on basis of the treatment procedure of this patient.

**Keywords:** Subtotal gastrectomy, Cholecystocholedocholithiasis, Laparoscopic common bile duct exploration (LCBDE).
VF03-3
Laparoscopic Radical Antegrade Modular Pancreatosplenectomy
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Although laparoscopic distal pancreatectomy is widely accepted for benign or borderline malignant pancreatic diseases, its application for pancreatic ductal adenocarcinoma (PDAC) remains controversial. Several recent reports have shown that laparoscopic distal surgery, including radical antegrade modular pancreatico-splenectomy (RAMPS), is associated with similar postoperative complications and survival outcomes compared with open surgery, and offers several advantages, particularly shorter hospital stay and less blood loss. However, potential risk of bias cannot be excluded because these results were obtained in retrospective studies. More importantly, it is unclear whether the extent of surgical resection is comparable between laparoscopic and open distal pancreatectomy. The aim of this video article is to show the technical feasibility of laparoscopic surgery to reproduce open RAMPS in terms of the extent of surgical resection.

Keywords: Distal pancreatectomy, Radical antegrade modular pancreatectomy, Laparoscopy, Pancreatic ductal adenocarcinoma.

VF03-4
Serous Microcystic Cystadenoma (SMCA) of the Pancreas
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Background: SMCA of the pancreas is a rare benign tumor occurring predominantly in elderly women, composed of numerous small cysts arranged around a central stellate scar. The cysts vary in size from 0.01 cm to 2 cm in diameter and are filled with clear or blood stained fluid. The tumor cells are strongly positive for EMA and CK 7, 8, 18 and 19.

Conclusion: SMCA of the pancreas is a rare benign tumor. Diagnosis is difficult in asymptomatic patients. CT angio-scan with pancreatic protocol is method of choice for preoperative diagnostic. Surgical treatment is recommended with different type of procedure according to tumor localization.

Keywords: Serous microcystic cystadenoma, Laparoscopic pancreatic resection.

VF03-5
The Straightened Splenic Vessels Method Dramatically Improves Surgical Outcomes after Laparoscopic Distal Pancreatectomy
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Background: Laparoscopic distal pancreatectomy (LDP) is widely used to treat pancreatic tumors. However, separating the splenic artery and vein from the pancreatic parenchyma sometimes requires advanced techniques, particularly for laparoscopic splenic vessel-preserving distal pancreatectomy (LSVPDP). Herein, we describe our novel ‘straightened splenic vessels’ (SSV) method that we developed for this procedure, which dramatically improves surgical outcomes.

Methods: To adjust the ultrasonic instrument axis, the splenic artery was straightened by grasping two points of its nerve sheath after the pancreas was widely mobilized at the superior border of the pancreas. Then, the layer between the splenic artery’s nerve sheath and the pancreatic parenchyma was dissected to isolate the splenic artery. Next, the pancreas was completely mobilized from body to tail at the inferior border of the pancreas, and the splenic vein was straightened by three-point retraction and separated from the pancreatic parenchyma. To evaluate this technique’s efficacy and outcomes, we retrospectively investigated 40 patients who underwent LDP with pancreatic transection on the left side of the superior mesenteric artery for benign or borderline malignant pancreatic tumors.

Results: The SSV technique was performed in 21 consecutive patients; results were compared to those of 19 patients treated with conventional LDP. In 29 patients who underwent LDP with splenectomy, the mean operating time was significantly shorter in the SSV group than in the conventional group (P = 0.020). In 11 patients who underwent LSVPDP, mean intraoperative blood loss in the SSV group was 23.8 ml, significantly lower than that in the conventional group (P = 0.019).

Conclusions: This method is feasible and safe for separating the splenic artery and vein while performing LDP, particularly LSVPDP, with little intraoperative blood loss and short operation time and can be applied as a standard procedure for LDP.

Keywords: Laparoscopic distal pancreatectomy, Spleen-preserving distal pancreatectomy, Straightened splenic vessels method, Pancreatic tumor.
Laparoscopic Distal Pancreatectomy Focusing on the Dorsal Side of the Pancreas (Ligament of Treitz Approach in Laparoscopic Modified RAMPS)

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Introduction: It’s important to recognize the layer of the dorsal side of the pancreas while performing the laparoscopic distal pancreatectomy. Radical antegrade modular pancreatosplenectomy (RAMPS) was introduced to obtain a higher rate of R0 of the dorsal side of the pancreas. We performed ligament of Treitz approach in Laparoscopic modified RAMPS.

Indications: We performed the new technique in left-sided pancreatic cancer patients. These tumors were diagnosed to be located within the pancreas.

Methods: A totally laparoscopic approach was used. After we examined the location of the pancreatic tumor by laparoscopic ultrasonography, we resected the ligament of Treitz and enter into the anterior space of the aorta. The most dorsal plane was the level of the aorta where the left renal vein was exposed. We removed regional nodes along the root of the SMA. We dissected the celiac axis, hepatic artery. After tunneling between the pancreas and the SMV, the neck of the pancreas was slowly divided. The splenic vein and artery were clipped and divided. We could enter into the dorsal space of the pancreas easily and safely because a large following the resection of the ligament of Treitz at the beginning of the operation. After we reached the level of the aorta, we dissected the dorsal plane toward the left side. Finally, the left-sided pancreas with Gerota’s fascia was removed. The lymph nodes along the splenic artery and splenic hilum were removed en-bloc with the specimen.

Results: The median operative time is 417 min, blood loss is 75 ml, lymph nodes are 31. Two thirds patients began to receive adjuvant chemotherapy by postoperative 14 days.

Conclusion: The ligament of Treitz approach in laparoscopic modified RAMPS is a feasible technique for well-selected pancreatic cancer patients.
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