Early Rectal Cancer: Definition and Management

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Key Words

Rectal cancer · Preoperative staging · Preoperative radiotherapy and chemotherapy · Transanal endoscopic microsurgery

Abstract

Background: Local excision of rectal cancer is an alternative to radical resection but today its role surrounding the management of patients with early stage rectal cancer (T1-T2-N0) represents an important surgical issue. **Aim:** To analyze the results of 135 patients with early stage low rectal cancer treated with local excision by transanal endoscopic microsurgery and in the case of T2 also by neoadjuvant therapy. **Study Design:** 135 patients with T1-T2-N0-M0 rectal cancer were enrolled in the study. Staging according to the definitive histological findings was as follows: pT0 in 24 patients (17.8%), pT1 in 66 patients (48.8%) and pT2 in 45 patients (33.4%). **Results:** Minor complications were observed in 12 patients (8.8%) whereas major complications were seen only in 2 patients (1.5%). At a median follow-up of 78 (36–125) months, local recurrences occurred in 4 patients and distal metastasis in 2 patients (all patients were staged preoperatively T2). Disease-free survival rates in T1 and T2 patients were 100 and 93% respectively at the end of follow-up. **Conclusions:** With respect to local recurrence and survival rate, the long-term results of early stage rectal cancer in patients

treated with transanal endoscopic microsurgery were similar to those reported in the literature after conventional surgery (total mesorectal excision).

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Colorectal cancer is the second most common cause of cancer deaths in the Western world. More than 35,000 new rectal cancers are diagnosed every year in the USA and 25% are stage I disease. Fewer than half of these cases are lesions confined to the mucosa and submucosa [1].

In the past the gold standard of treatment for all low rectal cancers was anterior resection with coloanal or low rectal anastomosis and abdominoperineal resection. These procedures led to good results in terms of local recurrence and 5-year survival rate [1–4]. Unfortunately, resection of the rectum is a major surgery procedure associated with significant morbidity (7–68%), mortality (0–6.5%), alteration in body image and sometimes distressing functional consequences for the patients [2].

In the past the use of local excision was limited to high-risk patients for major surgery, especially in the elderly and those who refused radical surgery because of permanent colostomy. However, the high number of complications, functional sequels and sphincter sacrifice rates associated with radical resection prompted researchers to reevaluate local excision for distal rectal cancer as an al-

ternative to radical resection. Excision has been suggested as a possible curative therapy.

Recent literature considers local excision as curative surgery in most of the patients with a primary tumor which is limited to the mucosa and submucosa (T1-N0-M0) and does not present cytological or histological high-risk features such as poorly differentiated cells, vascular and neural invasion, presence of mucinous histology and tumor ulceration) [5–9]. In these patients, local excision of rectal tumors preserves anal continence, bladder and sexual functions and achieves the same oncological results. In T1 patients, local excision is feasible because the curative rate is high (>90/95%) and the risk of recurrence is low (<10/5%) as reported in the literature [1, 4].

Winde et al. [5] reported an important study where they compared the results of local excision for early rectal carcinomas using transanal endoscopic microsurgery versus anterior resection. They concluded that the results were comparable in local recurrence and survival rates and that the TEM technique should be preferred because of the superior overview during operation and for the full-thickness excision.

Today, the role of local excision combined with new adjuvant therapy in the management of patients with T2-N0 rectal cancer represents an issue of debate. Once the tumor invades the muscularis propria (T2), preoperative radiochemotherapy is strongly recommended because local excision alone has a too high percentage of local recurrence [4, 6]. Data, especially from Europe, have suggested that preoperative radiation reduces local recurrence rates and improves overall survival when compared with surgery alone, and that it is more effective than postoperative radiotherapy [2–4, 7–19]. Therefore, high-dose preoperative radiation offers the opportunity for a downstage or a reduction in the neoplastic mass in order to preserve the anal sphincter and enhance quality of life postoperatively. The advantages of preoperative new adjuvant therapy are: biological (decreased tumor seeding at the time of surgery, lymph node sterilization of micrometastasis and increased radiosensitivity due to more oxygenated cells) and functional aspects (ability to change the coloanal resection to local excision). An additional benefit in patients with local advanced and unresectable disease is the possibility to increase the resectability rate [20–23].

Many surgical options are described in the literature for local therapy of rectal cancer such as transanal and transsphincteric approaches. Transanal excision (Parks, Mason, Francillon, etc.) is the most popular technique: it has very low complications rates (0–15%) and early recovery but, for technical reasons, this method is limited to

low and mid-rectal lesions and it does not allow an adequate view of the operative field and is generally performed as a full-thickness excision without a complete ablation of the local perirectal fat [6]. Other approaches of local excision for rectal cancer such as the transsphincteric or transsacral approach have been described. These techniques can reach higher lesions, but have high complication rates up to 40% of cases and only few studies including a small number of patients of local excision have been reported [6].

In 1983, Buess et al. in Germany developed transanal endoscopic microsurgery (TEM) [24], and resolved many problems of traditionally local treatment. This method is a minimally invasive technique, has a great magnification and an excellent lighting of the operative field that allows a clear identification of the margins of the lesion and the precise excision of tumors in the rectum extending into the upper rectum or lower sigmoid colon via the transanal approach. Compared with the traditional transanal approach using Park's retractor, TEM allows an excellent exposure of the operative field with a stereoscopic endoscopic vision that permits to perform a complete full-thickness excision with an appropriate margin (ablation with 1 cm of surrounding free margin) and to remove all the adjacent perirectal fat making the same plane of dissection utilized in the TME (the so-called 'holy plane'). The precise excision of the tumor performed by TEM facilitates a more accurate and oncologically correct excision, in fact the resection margin of the local surgical specimen is of critical importance in relation to the development of recurrence.

Selection of appropriate patients for local excision is a crucial step [2]. Due to the fact that local excision of rectal cancer does not remove the draining lymph nodes, only cancers localized on the rectal wall are suitable for curative local excision alone. Patient selection needs to be based on the probability of nodal disease. Accurate preoperative assessment of depth of invasion is important because the risk of lymph node metastases increases with T-stage being 0–12% for T1, 12–28% for T2, and 36–79 for T3–T4 lesions [24]. Thus, preoperative T-staging and the exclusion of distant metastases are mandatory for an appropriate selection of patients eligible for curative local excision. Therefore, the preoperative staging must include: digital examination, endoscopy, endosonography (EUS) and computed tomography (CT) and/or magnetic resonance imaging (MRI). Clinical examination by digital rectal examination is the usual method of staging distal and mid-rectal cancer, but the accuracy depends on the experience of the examiner. The most useful adjunct

for the preoperative assessment of rectal lesions is EUS that allows clear visualization of the layers of the rectal wall and thus enables the depth of invasion to be measured accurately. EUS, although operator-dependent, can be performed with minimal bowel preparation and patient discomfort, and it is currently considered the most accurate method for local staging of rectal cancer. EUS has an 82–93% accuracy with respect to depth of invasion, although overstaging has been reported [24]. Assessment of lymph node involvement is less reliable, with reported accuracy of 65–81% [24]. Metastatic lymph nodes can be differentiated from reactive changes because they are hypoechoic and irregular. The vast majority of patients with rectal cancer have an abdominopelvic CT prior to surgery in order to explore the lymph node status and to identify metastatic disease. MRI, when used, has accuracy rates comparable to CT scan. In our experience the best diagnostic tool to evaluate the T-staging for low rectal lesion is the transanal EUS with a rotative probe of 7 MHz; MRI and CT give a more accurate evaluation of the N. Recently the introduction in clinical practice of ultrasound with fine-needle biopsy, multislide spiral CT scan and so-called ‘virtual endoscopy’ have significantly improved our ability to achieve a correct preoperative staging of rectal cancer.

In conclusion, local excision can be considered as curative in patients with a primary tumor confined to the mucosa and submucosa (T1N0M0), without high-risk features; on the contrary, once the tumor invades the muscularis propria (T2) neoadjuvant treatment is strongly recommended if we are planning to perform local excision in order to avoid the risk of a major operation.

Personal Experience

516 patients underwent TEM surgery at the Departments of Surgery ‘Paride Stefanini’ (II Clinica Chirurgica, University of Rome ‘La Sapienza’) and General Surgery of the University of Ancona from May 1992 to December 2005: 306 (59.3%) for adenomas, 196 (38%) for rectal carcinomas and 14 (2.7%) for other miscellaneous rectal lesions. 135 (26.2%) patients (92 male and 43 women) were treated by TEM for T1-T2-N0-M0 rectal cancers (51 patients T1-N0-M0 and 84 patients T2-N0-M0). Mean age was of 63 (range 31–95) years.

The preoperative staging was evaluated by: total colonoscopy, standard endoscopic biopsies (taken at 1 cm around the tumor and identified with a number), rigid rectoscopy (in order to perform the macrobiopsies of the

tumor area, to measure the exact distance of the lesion from the anal verge to evaluate the circumferential tumor localization and to select the position of the patient on the surgical table during the operation), transanal EUS, MRI and/or CT, bone scintigraphy, chest X-rays and digital examination to evaluate tumor fixation.

Patients with preoperative diagnosis of T2 rectal cancer underwent preoperative radiotherapy according the technique described by Marks et al. [21–23]. The total dose given was 50.4 Gy in 28 fractions over 5 weeks. The irradiated areas were: anus, rectum, mesorectum, regional and iliac lymph nodes. Continuous infusion of 5-FU, 200 mg/m²/day, was performed as long as radiotherapy treatment lasted.

Forty days after the end of neoadjuvant therapy a new preoperative evaluation of the lesion and staging was performed by endoscopy to determine the tumor diameter changing (using as reference point the tattoo spots), transanal ultrasound, CT scan and/or MRI and digital examination. The operations were performed about 45–55 days after the end of radiochemotherapy.

Results

Minor complications occurred in 12 patients (8.8%) and included a partially leaking suture in 9 (6.6%) patients, stool incontinence in 2 (1.5%) cases, and rectal hemorrhage in 1 (0.7%) patient. We observed major complications only in 2 patients (1.5%). Definitive histology in the T1 group confirmed pT1 in all patients. In T2 patients, histology demonstrated 24 pT0, 15 pT1 and 45 pT2.

Average follow-up was 63 (range 3–164) months. Neither recurrence nor cancer-related mortality was observed in pT0 and pT1 rectal cancer patients. Local failure occurred in 4 pT2 patients after 30, 12, 8 and 6 months respectively and all patients underwent laparoscopic abdominal perineal resection. The first patient died from systemic diffusion of the tumor 4 months after reoperation, the second patient had a recurrence after 12 months of follow-up and underwent laparoscopic abdominoperineal resection and later died from systemic neoplastic disease, while the other 2 patients are still alive and disease-free. Two pT2 patients developed metastasis: the first underwent hepatic resection and died 13 months later from systemic disease and the second died 24 months later from hepatic and lung metastasis. At the end of follow-up, specific rectal survival was 100% for T1 patients and 93% for T2 patients. Overall survival was 94.1% for T1 and 88.1% for T2.

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