Bouveret's Syndrome: Management and Strategy of a Rare Cause of Gastric Outlet Obstruction

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Dear Sir,

Bouveret's syndrome is a subgroup (less than 1%) of gallstone ileus in which a cholecystoduodenal fistula allows the passage of a stone that obstructs the duodenum and causes gastric outlet obstruction [1].

Since the first description by Léon Bouveret in 1896, fewer than 200 cases have been described in the worldwide literature [2].

Although there are little data about the outcome of Bouveret's syndrome, the mortality rate due to gallstone ileus was nearly 50%, but in recent years has improved to about 15% [3]. This high mortality may be related to the advanced age of the typical patient as well as other comorbidities [4, 5]. The decrease in morbidity in recent years likely represents the impact of endoscopic treatment option in lieu of surgery as well as early diagnosis with non invasive imaging [4].

Thus, the importance of a correct pre-operative diagnosis and management is the key in this rare pathology. We here report on a case of Bouveret's syndrome and propose an algorithm for the therapeutic strategy.

A 78-year-old man with unremarkable past medical history complained of loss of appetite, and sensation of early repletion for 3 weeks. Physical examination was unspecific with mild epigastric tenderness. Laboratory values revealed only mild leukocytosis (11 g/l) and increased gamma-

Fig. 1. **a** Computed tomography showing gastric outlet obstruction and an intraluminal lesion situated in the first duodenum (*), with air outside the gastrointestinal lumen. **b** A biliary stone protruding through the pylorus. **c** Attempt to endoscopically catch the stone without success. **d** The biliary stones after extraction.

Fig. 2. Algorithm of management of a suspicion of Bouveret's syndrome.

GT values (94 IU/l). Plain abdominal radiographs were considered normal. CT scan disclosed a dilated stomach filled with liquid and gas as well as 5 cm in diameter radiopaque intraluminal lesion in the first portion of the duodenum (fig. 1a). After gastric emptying, upper GI endoscopy was performed under general anesthesia. The obstructive biliary stone was clearly visualized (fig. 1b), and many extraction attempts failed despite the use of lithotripsy Dormia baskets (Medizin-Technische-Werkstätte, Wesel, Germany) and Roth basket (fig. 1c). A median exploratory laparotomy was then performed during the same session of general anesthesia, revealing a small gallbladder which had fistulized into the first portion of the duodenum. The obstructing stone was easily removed as well as a second large stone from the gallbladder (fig. 1d).

The postoperative period was complicated by a pneumonia which rapidly responded to intravenous antibiotherapy, and the patient was discharged at day 12.

Discussion

Patients with Bouveret's syndrome usually present with symptoms of gastric outlet obstruction [1] and rarely with massive upper GI bleeding [6].

Diagnosis is relatively easy at upper GI endoscopy or CT scan, but it is rarely done preoperatively due to its rarity [6]. A plain abdominal radiograph or a CT scan usually shows a dilated stomach but may be pathognomonic if it discloses the Rigler's Triade (aerobilia, mechanical bowel obstruction, and an ectopic gallstone) [3–5, 7]. Upper GI endoscopy reveals gastric out-

let obstruction in virtually all cases, but discloses the obstructing stone in only 69% of cases [8].

Therapeutic options available to remove the obstructive stone include:

- endoscopic stone retrieval after fragmentation (e.g. mechanical lithotripsy, extracorporeal shock-wave lithotripsy [9], dye-laser [10]);
- single- or double-staged surgery (i.e. stone removal associated with or followed by cholecystectomy and fistula repair [2, 7, 8]) by laparotomy or laparoscopy [11].

The advantages of a one-step surgical procedure are the avoidance of late complications (recurrent gallstone ileus, cholecystitis, cholangitis, and malignancy of the gallbladder). On the other hand, there are more early postoperative complications and a higher mortality rate when an extensive one-step procedure is performed [2, 12] as compared to a two-step procedure. Furthermore, reports indicate that biliary-enteric fistulas may close spontaneously after passage of the stone [3, 10], especially if the cystic duct is patent and residual gallstones are not present [12].

We propose an algorithm for the management of a suspicion of Bouveret's syndrome (fig. 2). The choice between an immediate surgery rather than an endoscopic procedure is based on the size of the stone, the availability of the exams, the hemodynamic conditions of the patient, and the patient's choice. When the stone is large and impacted, the risk of perforation with an endoscopic procedure exists [5, 13]. Furthermore, an endoscopic treatment does not correct the cholecystoduodenal fistula and could not examine for additional stones in the intestinal lumen

distally [5]. Recently, Cappell et al. [8] reported a success rate of 60% with laser lithotripsy, but only of 25% for mechanical lithotripsy and 20% for extracorporeal shock-wave lithotripsy. Surgery has a higher success rate (more than 80%) [8].

In cases of patients with contraindication for surgery, an endoscopic procedure may be a good alternative, because of the low rate of complications. The fragments can be removed endoscopically or flushed to pass spontaneously through the intestine [10], but with the risk of a more distal gallstone ileus [13], necessitating a close follow-up. In cases of endoscopic failure, surgery becomes mandatory.

In conclusion, Bouveret's syndrome remains a rare cause of gastric outlet obstruction, but the management remains primordial to minimize the high mortality observed in this pathology. The treatment is based on endoscopy in feasible cases and surgery otherwise.

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