Gallstone ileus: unusual cause of bowel obstruction. Experience of an African center and literature review

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ABSTRACT
Gallstone ileus (GI) is an uncommon cause of bowel obstruction that is associated with high rates of morbidity and mortality. Management of GI remains controversial due to concerns about timing and prioritization of management of coexisting bowel obstruction and cholecystoenteric fistula. This retrospective study reports five cases which were treated in the surgery department for GI in a hospital in Rabat, and a literature review. Of the five patients identified, the average age was 62 years. Length of obstruction prior to operation was 2.8 days. Intraoperatively, the size of the gallstones ranged from 2.5 to 3.8 cm in diameter. Eighty percent patients underwent a simple enterolithotomy and only one had a laparoscopically assisted surgery. Mortality in this series was 20%, and the single patient death was attributed to comorbid conditions. In this series of five patients, GI affected the more elderly population (average age: 62 years) and the diagnosis was established 2 to 3 days after the onset of symptoms. Given the high rates of morbidity and mortality associated with the management of GI, a simple enterolithotomy remains the best solution and one stage procedure should be reserved mainly for younger patients.

Keywords: Gallstone ileus, biliary enteric fistula, enterolithotomy, one stage procedure, laparoscopic assisted surgery.

1. Introduction
Gallstone ileus (GI) is an unusual cause of bowel obstruction. Described for the first time by Bartholin in 1654, this entity affects mainly elderly people, thus the morbidity and mortality rates are not negligible [1,2]. Its management is still controversial between those who prefer a simple enterolithotomy and those who require a treatment for the biliary fistula. The aim of this study was to draw attention to this rare pathology, its clinical presentation and its treatment modalities through both, the presented experience and a literature review.

2. Subjects and Methods
This is a report of a retrospective study of five patients seen at the Military Hospital of Rabat and diagnosed with GI from January 2008 to January 2018, as well as a literature review (Table 1). Five different surgeons managed the care of patients in this series. GI is defined as having a bowel obstruction secondary to a blockage in the small bowel due to a gallstone. A clinical observation of small bowel adhesion up to the wall of the gallbladder was also required for this to be classified as GI.

3. Results
Among the five patients included in this study, three (60%) were females with an average age of the studied group at 62 years. Only three cases reported a history of biliary symptoms.

All the patients presented signs of small bowel obstruction without fever or jaundice. The average time of diagnosis was 2.4 days after the onset of symptoms. Except for one patient, the computed tomography showed the classical
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4. Discussion

4.1. Diagnosis

GI is an uncommon cause of small bowel obstruction; it represents less than 5% of all mechanical obstructions [3,4]. This entity is due to chronic inflammation of the gallbladder leading to a bilioenteric fistula. It’s frequently located between the gallbladder and the duodenum (23%–96.5%), but it can also concern the jejunum, the colon or the stomach [4,5]. Stones with a diameter of less than 2.5 cm usually are expected to pass through the remaining digestive tract while those over 2.5 cm are mainly blocked in the terminal ileum and in the ileocecal valve due to their relatively narrow lumen and potentially less active peristalsis [3,6]. Rarely, the duodenal bulb becomes the site of stone impaction and leads to a gastric outlet obstruction [5].

This rare entity mainly affects the elderly population with a female to male ratio estimated at (3: 1) [4,5,7]. Its symptoms are mainly nonspecific like abdominal pain,
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nausea, vomiting, abdominal distension, and jaundice. A study found that 27% to 80% of patients may have a past history of cholecystitis or other biliary symptoms [5]. Consequently, the preoperative diagnosis is obtained only in 50%-60% of cases with an average time, until diagnosis, ranging from 3 to 4.5 days [8,9].

Rigler [10] described a triad of radiological signs (small bowel obstruction, pneumobilia and ectopic stone) that might lead to the diagnosis of GI. CT imaging is much more sensitive and GI is diagnosed at a frequency of 77.8% as compared to 14.8% with radiographs, and only 11.1% with ultrasonography [11].

Despite modern imaging, the diagnosis of GI is often made only after operative abdominal exploration.

4.2. Treatment

Topics in the management of GI that still remain controversial include, whether to concurrently excise the cholecystoenteric fistula, superiority of laparoscopic or open surgery, and the timing of reoperation to repair the fistula. Three strategies are possible: a simple enterolithotomy, a one stage procedure (Enterolithotomy with cholecystectomy and fistula closure), or a two-stage procedure (Enterolithotomy followed by a delayed cholecystectomy and a fistula repair, 4 to 6 weeks later) [5,12,13].

As demonstrated through the largest published review of GI during the last century, Reisner and Cohen [9] showed that enterolithotomy alone was safer with lower mortality than other procedures. A retrospective review published in 2014 about 3268 cases of GI concludes that, independently of patients and hospital factors, a one-stage procedure is associated with higher mortality, length of hospital stays and consequently a higher overall hospital charge [4]. Thus, a one-stage procedure with concurrent fistula closure should be reserved for younger patients with low comorbidities [4,14].

4.3. Recurrent GI

The literature estimates the risk of GI recurrence (GIR) between 5% to 8% [15–18]. It is the result of an untreated biliary-enteric fistula with cholelithiasis; however, it can also occur because of a non-obstructive biliary stone (more proximal in the small intestine) which escaped detection during the first surgery. A systematic review related to the recurrence of GI (from 1912 to 2015) reports 113 cases and concludes that 85% reoccurred within 6 months from the first intervention and 62.6% within 6 weeks. Most of the patients (86.7%) were treated initially by simple enterolithotomy and only 1.9% had a single stage procedure [18].

The GIR represents a difficult challenge for most surgeons because they have to treat the emergency obstruction and also, if possible, manage any causes of recurrence. Results from the previous study [18] showed that, mortality wise, enterolithotomy was safer (mortality estimated at 4.8%) than single stage surgery (22.4%).

4.4. Laparoscopic approach

Laparoscopic treatment of GI is uncommon and requires advanced surgical skills. In the present series, only one patient (20%) had a laparoscopically assisted enterolithotomy, while in the review published by Halabi et al. [4], 10% of cases were managed laparoscopically.

Moberg et al. demonstrated through a retrospective study that laparoscopic enterolithotomy is feasible and represents a better choice of treatment, with lower morbidity and lower complications than the open approach.
5. Conclusion

GI is an uncommon complication of cholelithiasis which affects mainly the elderly population. To decrease morbidity and mortality rates, a simple enterolithotomy (laparoscopically assisted if possible) represents the best choice. A two-stage procedure with delayed fistula repair is primarily required for young patients to prevent recurrence.

List of Abbreviations
GI Gallstone ileus
GIR Gallstone ileus recurrence

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