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Gall Stone Ileus: Unfamiliar Cause of Bowel Obstruction. Case Report and Literature Review

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Abstract | **Case Report**

***Introduction and Importance*:** Gallstone ileus is defined as the occlusion of the intestinal lumen due to the impaction of one or more gallstones. The optimal management of gallstone ileus is not consensual. We report a rare case of gallstone ileus with a successful surgical treatment for a 65 year-old female. ***Clinical Discussion*:** We present a case of gallstone ileus successfully treated. Gallstone ileus is a rare condition, most commonly occurring in the terminal ileum and ileocecal valve, where the intestinal lumen is narrow and more prone to obstruction. It primarily affects elderly patients with multiple comorbidities, making its clinical presentation often nonspecific. Computed tomography plays a crucial role in diagnosis, offering high specificity in identifying the classic Rigler's triad and confirming the presence of an obstructing gallstone. The optimal surgical approach remains debated, with no universally accepted standard. In our case, enterotomy was necessary for the extraction of a biliary stone, ensuring a definitive resolution of the obstruction. ***Conclusion*:** Gallstone ileus is a rare but serious condition, predominantly affecting elderly patients with comorbidities. Its clinical presentation is often nonspecific, making computed tomography imaging essential for accurate diagnosis. The surgical management remains non-consensual, requiring an individualized approach based on the patient's condition and intraoperative findings.

Keywords: Gallstone Ileus, Bowel Obstruction, Cholecystoenteric Fistula, Enterolithotomy, Rigler's Triad, Elderly Patients.

INTRODUCTION

Gallstone ileus is defined as the obstruction of the intestinal lumen due to the impaction of one or more gallstones [1]. It's a rare complication accounting for 1 to 4 % of small bowel obstructions [2]. It's a result of a cholecysto-enteric fistula responsible for the migration of gallstones in the gastrointestinal tract [3]. This condition develops in 0.3 to 0.5 % of patients having cholelithiasis [4]. It's characterized by high mortality rates which range between 12 and 27 % [5]. The optimal management of gallstone ileus is not consensual [6].

We present a rare case of gallstone ileus with a successful surgical treatment for a 65 year-old-female. We performed a review of the literature.

CASE PRESENTATION

We report the case of an 65-year-old female with the following chronic medical condition: hypertension. She presented to our emergency department with a four day history of progressively worsening diffuse colicky abdominal pain that is associated with repetitive vomiting of food particles and bilious material. Additionally, she reported a two day history of constipation. Her vital signs showed a heart rate of 78 beats per minute, blood pressure of 110/60 mmHg, respiratory rate of 16/ min and a temperature of 37 C. Focused physical examination of the abdomen revealed a moderate abdominal distention, slight epigastric tenderness with mild rebound and no guarding was noted. Laboratory investigations revealed a deranged renal function and leukocytosis (13,000/mL). Liver function tests were unremarkable.

The patient was initially resuscitated with intravenous fluid and had nasogastric tube inserted for decompression. On plain x-ray of the abdomen in an erect posture, we found multiple air-fluid levels in the central abdomen with a relative paucity of bowel gas distally, confirming the diagnosis of intestinal obstruction. An computed tomography scan of the abdomen was obtained that revealed dilatation of the biliary system including the intrahepatic ducts with

coexisting pneumobilia, cholecystoduodenal fistulization with contracted irregular gallbladder outline containing air locules extending to the juxtapositioned duodenal lumen with a heterogenous enhancement at the site of the abnormal communication. Ectopically positioned hyperdense luminal structure, measuring about 3 × 2,5 cm in caliber at the ileal segment suggestive of a gallstone resulting in distended small bowel dilataion with adjacent collapsed large bowel loops. The decision was made to proceed for an urgent exploratory laparotomy to relieve the obstruction.

The intraoperative findings revealed an impacted stone roughly 40 cm from the ileocaecal junction. An enterolithotomy was performed over a healthy ileal segment few centimeters proximal to the transition zone demonstrating an oval shaped stone measuring roughly 3 cm in size was removed via a longitudinal incision and the defect was closed primarily in a transverse fashion using an absorbable suture (Fig).

Fig. 1: Gallbladder stone was obstructing a ileal loop

Manual inspection of the entire small and large bowel revealed no other stones. The right upper quadrant was examined revealing presence of very dense adhesions between the gallbladder and the duodenum and absence of any retained stone and therefore, the gallbladder was not manipulated and the fistula was not excised to avoid causing bleeding or injuries. The patient stayed postoperatively for 5 days and her hospital stay was uneventful.

DISCUSSION

Gallstone ileus is a rare but serious complication of gallstone disease (cholelithiasis), affecting approximately 0.9 per 100,000 people each year [3-7]. It is significantly more common in women, with a female-to-male ratio ranging from 3:1 to 7:1, and primarily affects elderly patients with a history of gallstones. These patients often have underlying health conditions and frailty, which further increase the risk of complications, morbidity, and mortality [3-8].

Gallstone ileus occurs when a gallstone migrates into the intestine through a fistula, an abnormal connection that forms between the gallbladder and the bowel due to chronic inflammation and constant pressure from the gallstone [9]. The most common type, accounting for 85% of cases, is a cholecystoduodenal fistula, where the gallstone enters the duodenum. Less frequently, fistulas can connect the gallbladder to the stomach (cholecystogastric), jejunum (cholecystojejunal), or colon (cholecystocolonic) [3-8].

Although rare, other unusual mechanisms of gallstone migration have been reported. In some cases, fistulas may form directly from the bile ducts, increasing the risk of cholangitis [9]. In other instances, gallstones pass naturally through the ampulla of Vater, where they may grow in size over time or be inadvertently displaced during surgical manipulation of the gallbladder or bile ducts [10, 11].

To cause an obstruction the stone must be at least 2 cm in diameter [3-12], and the sites affected usually have significant narrowing in the bowel lumen; the most common are: terminal ileum and ileocecal valve (60–75%), proximal ileum and jejunum (20–40%), stomach (14%), sigmoid colon (4%) and duodenum (3–10%), the so-called Bouveret syndrome [13]. Also impaction at sites of strictures, such as Crohn's disease, diverticulitis or at the neck of Meckel's diverticulum, has been described [8].

The clinical manifestations of gallstone ileus are variable and usually depend on the site of obstruction. The onset may be manifested as acute, intermittent or chronic episodes [14]. The most common symptoms include nausea, vomiting and epigastric pain. Moreover, a small portion of patients may present with hematemesis secondary to duodenal erosions. Laboratory studies may show an obstructive pattern with elevated values of bilirubin and alkaline phosphophatase.

Diagnosing gallstone ileus is often challenging and usually relies on radiographic imaging. In fact, up to 50% of cases are only diagnosed during surgery (laparotomy).

The classic Rigler’s triad seen on radiography includes three key signs: mechanical bowel obstruction, pneumobilia (air in the bile ducts) and an ectopic gallstone located within the intestinal lumen.

However, another frequent finding in gallstone ileus is air within the gallbladder, which may further support the diagnosis [15].

Barium studies of the upper or lower gallstone ileus tract may occasionally help pinpoint the site of obstruction or the presence of a fistula. Additionally, abdominal ultrasound is valuable for confirming gallstone disease (cholelithiasis) and may even help visualize a fistula, if present [16].

Abdominal computed tomography becomes the more important modality in diagnosing gallstone ileus because of its better resolution. By comparing with plain abdominal film and abdominal ultrasound, it can provide a more rapid and specific diagnosis in emergency use. Lassandro *et al*., [17], compared the clinical value of plain abdominal film, abdominal ultrasound and abdominal computed tomography in diagnosing 27 cases of gallstone ileus, and found that the Rigler's triad presents14.81% in plain abdominal film, 11.11% in abdominal ultrasound, and 77.78% in abdominal computed tomography, respectively. Additionally, Yu *et al*., [18], studied the value of abdominal computed tomography in the diagnosis and management of gallstone ileus and concluded that the abdominal CT offers crucial evidence not only for the diagnosis of gallstone ileus but also for decision making in management strategy [18].

The optimal surgical approach for gallstone ileus remains a topic of debate. In most cases, laparotomy is the preferred method. There are two main surgical strategies: One-stage procedure – This involves removing the gallstone (enterolithotomy), performing a cholecystectomy, and closing the fistula in a single operation.Two-stage procedure – Initially, only an enterolithotomy is performed to relieve the obstruction, while the cholecystectomy and fistula closure are planned for a later stage.

The one-stage approach is advantageous because it reduces the risk of recurrence, which has been reported in 8% to 33% of cases. However, it is also a technically demanding procedure and carries higher risks of morbidity and mortality, particularly in elderly patients with multiple comorbidities [2].

The two-stage procedure, on the other hand, is simpler and has a shorter operative time. Consequently, it represents the safest choice for patients with poor general conditions, dehydration, sepsis, and shock [19].

In recent years, some cases of laparoscopic management have been reported [7-20]. It has been found to be an effective and safe procedure, especially for the two-stage approach.

The surgical approach should be adapted to the general status of the patient, the hemodynamic status, the local conditions, and the surgeon's skills.

The prognosis of gallstone ileus is usually poor and worsens with age. Previous studies reported that the mortality rate is 7.5%-15% [19], largely due to delayed diagnosis and concomitant conditions such as cardiorespiratory disease, obesity and diabetes mellitus.

The postoperative recurrence rate of gallstone ileus is approximately 4.7%, with only 10% of patients requiring a second biliary surgery due to recurrent symptoms [21].

CONCLUSION

Developing a standardized diagnostic algorithm for bowel obstruction is essential for every institution, as it helps **e**nhance diagnostic accuracy**,** reduce surgical time, and ultimately improve patient outcomes**.** Gallstone ileus is a condition in elderly patients that usually present with concomitant diseases. Clinicians must suspect this disease in older patients with bowel obstruction and should look for Rigler's radiologic signs. Given the uncommon nature of this clinical entity, relevant literature is limited, and there are no randomized trials to support optimal therapy. Therefore, we suggest that enterolithotomy is the safest of the current options for the management of gallstone ileus.

Informed Consent: The patient has provided informed consent.

Conflicts of Interest: The authors declare no conflicts of interest regarding the publication of this paper

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