

Gallstone ileus – case description and literature review

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ABSTRACT

Gallstone ileus is a rare disease, arising due to intestinal obstruction caused by cholelith. It affects mainly patients between 60–70 years old and is a consequence of biliary intestinal fistula. Due to its uncommonness and the patients' age and comorbidities there is a lack of precise treatment and diagnostic guidelines.

The aim of this article is gallstone ileus literature review and case report from Independent Public Clinical Hospital No. 1 of Pomeranian Medical University in Szczecin, Department of General, Minimally Invasive and Gastroenterological Surgery Department. **Keywords:** gallstone ileus; hepatobiliary diseases; case report; literature review.

INTRODUCTION

Gallstone ileus is an intestinal obstruction caused by cholelith [1]. It is a rare disease whose treatment is still disputable [2]. The aim of this article is a gallstone ileus literature review and a case report from Independent Public Clinical Hospital No. 1 of Pomeranian Medical University in Szczecin (SPSK No. 1), Department of General, Minimally Invasive and Gastroenterological Surgery. This case report was prepared in concordance with SCARE 2020 [3]. Biliary obstruction is a rare but important condition that most frequently appears in older people with other health issues, and despite being discussed often in medical literature, there is no clear and universally accepted treatment plan for this condition. Every published case of biliary obstruction is, therefore, extremely valuable. They provide real-life examples of how it was handled and how it can or cannot be treated. Ultimately, by publishing these cases, a more effective treatment plan for biliary obstruction can be built.

CASE REPORT

A 76-year-old male presented to the SPSK No. 1 emergency department with nausea, vomiting, abdominal pain, and inability to pass gas and stool lasting around a week. Previously, the patient was hospitalized in a different unit but discharged himself due to a lack of symptom alleviation.

Physical examination showed abdominal distension and tenderness on palpation. Peritoneal signs were not observed. Results of laboratory tests indicated elevated levels of C-reactive protein (67.27 mg/L). No elevation was observed in leukocyte count, and in the levels of procalcitonin, amylases, lipases, bilirubin, and aminotransferases. A plain abdominal radiograph

visualised intestinal distension (up to 5 cm in the mid and left abdomen) with gas-fluid levels and no signs of perforation, aerobilia or cholelith. Vigorous but insufficient peristalsis with intestinal retention was observed during abdominal ultrasonography; however, gallbladder was not recognized. As a result of an incomplete diagnosis, a computed tomography scan was performed, but contrast enhancement was not used due to the patient's allergy. Tomography revealed the site of a change in intestinal diameter located around 50 cm from the Bauhin's valve. Proximal intestinal retention was seen with the gut widening to 40 mm. The radiologist suggested an obstruction due to intestinal adhesions. In the intrahepatic tract, gas was visible, and the gallbladder was imperceptible.

The patient was qualified for exploratory laparotomy. An intraoperatively widened small intestine was seen. Around 70 cm proximally from the Bauhin's valve, the presence of a 4 cm movable foreign body causing intestinal obstruction was confirmed. Distally to the described foreign body, deflated intestines were observed. Intestinal decompression was performed, and 2000 mL of fluid was removed. Due to the signs of ischemia and laceration in the affected intestines, wall segmental resection with side-to-side mechanical anastomosis was performed (GIA 60 mm). In the upper right quadrant of abdomen, there was a massive inflammatory infiltrate involving the hepatoduodenal ligament and duodenum. Because of the high risk of hepatobiliary tract damage, an attempt to perform cholecystectomy and gastrobiliary fistula closure was abandoned. A resected intestine with a gallstone inside and abdominal fluid was sent for histopathological examination.

After surgery, broad-spectrum antibiotics were introduced (proxacin and metronidazole). Parenteral feeding was applied for 4 days, and oral nutrition was started 2 days after surgery. On the 8 day, the patient's condition significantly improved, and he was discharged from the hospital without any disturbances.

Histopathological examination did not reveal cancerous cells, and carcino-embryonic antigen (CEA) and cancer antigen (CA) 19-9 markers were not elevated (Fig. 1).



FIGURE 1. Digital representation of the ileus

GALLSTONE ILEUS

Gallstone ileus accounts for 1–4% of intestinal obstructions [2], its risk in cases with choledocholithiasis is less than 1%, and 1 in 2 patients has a negative history of preceding hepatobiliary disease symptoms [4, 5]. The average age of onset is 60 and 70 years old and is 3 times more frequent in women than men [2, 5, 6, 7, 8]; however, adolescent cases are also reported [9]. Gallstone ileus recurrence is approx. 5% [10].

The first to report the case of gallstone ileus was Danish physician, mathematician, and theologian Thomas Bartholin (in 1654), although the first case series was published by Courvoisier in 1890 whose description consisted of an analysis of 131 cases, with mortality at 44% [11, 12].

Gallstone ileus is a condition characterized by intestinal obstruction due to gallstones. It is often difficult to diagnose due to its nonspecific or incomplete symptoms, which include severe abdominal pain [5, 6, 7, 8], nausea [5, 6, 7], vomiting [5, 6, 7], inability to pass gas or stool [5, 6, 8] or hemotheczia [8]. Abdominal distension and tenderness, decreased or absent bowel sounds [8], jaundice [7], and dehydration [8] may be revealed by physical examinations. Laboratory tests may show elevated markers of systemic inflammation, signs of dehydration, and hyperbilirubinemia [5]. However, radiological examinations is the ones that play a crucial role in diagnosis, with plain abdominal radiographs revealing symptoms such as aerobilia, cholelith visualization, and intestinal dilation. All 3 are called Rigler's triad [7, 8, 13] and often do not occur

together. The sensitivity of the plain abdominal radiograph technique varies between 40–70%. Abdominal ultrasonography is useful for visualizing gallstones and pneumobilia, but overall sensitivity does not exceed 75%. Computed tomography scans are considered highly effective in diagnosing gallstone ileus, capable of revealing intestinal dilation, pneumobilia, gastrobiliary fistulae, and the location of the cholelith, with an effectiveness rate of 99% when used with contrast enhancement [14]. With regard to the course of illness, it can be divided into acute, subacute, and chronic. The subacute form is referred to as partial intestinal obstruction, meanwhile chronic gallstone ileus, also called Karevsky's syndrome, is characterized by alternating occurrence of asymptomatic periods with proceeding episodes of severe pain, due to cholelith movement through the intestines.

The most frequent location of intestinal obstruction caused by a gallstone is the distal segment of the small intestine (around 70%), which was described by e.g. Żyluk in 2 case reports [15], but cholelith can also become lodged in the duodenum and stomach (5–15%) and rarely in the colon [5, 6, 7, 16, 17], as reported in the case report of Creedon et al. [18]. Stricture after diverticulitis is the most common cause of the latter case [19]. The condition when a gallstone is trapped in the duodenum is called Bouveret's syndrome, whereas Barnard's syndrome occurs when blockage takes place around the ileocecal valve [20]. The diameter of a cholelith ranges 2.5–10 cm (4.5 cm average) [7, 19].

Usually, a gallstone enters the gastrointestinal tract through the fistula between its lumen and biliary tract. In other rarer cases, a cholelith may pass into the bowels through the ampulla of Vater or penetrate through the intestinal wall as a consequence of abscess formation from the stone left freely in the abdomen (e.g. after cholecystectomy). The most common fistula in gallstone ileus is the gastroduodenal fistula. Less common are canals draining to small intestines, colon, or stomach [6].

TREATMENT

No strict guidelines for gallstone ileus have been established; recommendations are still disputable and the range of possible treatments is wide [7]. The optimal therapy choice is hampered by patients' age and comorbidities. The surgeon is forced to make a difficult decision whether to apply a 2-stage operative treatment with delayed fistula closure and cholecystectomy or a full 1-stage operation. Simple enterolithotomy and leaving fistulae for self-closure is also a credible option [20, 21]. Additionally, the difficulty increases due to the lack of randomized studies that would prove the accuracy of certain therapies [22]. Conservative treatment is not advised because self-resolution of gallstone ileus is very uncommon, and the minimal goal of any possible management is to restore the permeability of the gastrointestinal tract. An exceptionally conservative approach may be applied when obstruction occurs in the colon; however, the rate of failure is high [19]. It is worth mentioning that with the development of surgical techniques decrease in mortality is

observed; in the beginning of 20th century it was 60% and now it is 10% [7, 10, 23].

There are 4 main death risk factors:

1. average patient age, which is 60 and 70 years old,
2. comorbidities like diabetes or chronic heart disease,
3. delayed time of final diagnosis due to the rarity of the disease and its asymptomatic course,
4. hampered recovery due to increased complications after operative treatment, e.g. pneumonia [7, 20].

Endoscopic treatment of gallstone ileus is possible when a stone is located in the stomach, duodenum, or colon and carries a high risk of failure [7, 8, 24]. Extracorporeal shock wave lithotripsy (ESWL) technique, yttrium-aluminum-garnet laser (YAG), mechanical and electrohydraulic lithotripsy are possible choices for endoscopic management [25, 26, 27, 28].

Operative treatment may be 1-stage or 2-stage. The range of possible techniques varies from simple enterolithotomy, segmental intestinal resection, closure of fistula, and cholecystectomy. Colostomy and Hartmann's procedure are also possible when the obstruction is located in the colon.

A vast number of authors consider simple enterolithotomy as a sufficient and safe technique [7, 24, 29] due to its lower risk of complications and mortality, contrary to 1-stage procedure [7, 21, 30], and emphasize that self-closure of gastrobiliary fistulae is possible. This is associated with a higher risk of cholangitis and carcinoma [21], although complications after leaving pathological passage between the biliary and gastrointestinal tract intact are not common and only 10% of patients require reoperation [28].

CONCLUSION

Gallstone ileus is a rare and often asymptomatic disease and, as demonstrated in our case, the final diagnosis may be made intraoperatively. In such cases, the surgeon faces a critical decision regarding the appropriate procedure to address the patient's condition. This decision involves choosing between a simple segmental intestinal resection or a wider approach. While the optimal treatment for gallstone ileus remains a subject of debate, the described case reinforces the validity of the option of simple enterolithotomy with intestinal resection, particularly for older patients with comorbidities. This approach allows for a quicker recovery and carries a lower perioperative risk.

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