



Cholelithiasis as A Non-Specific Cause Of Mechanical Ileus



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Abstract

Gallstone ileus is one of the rarest causes of mechanical small bowel obstruction, with an incidence between 1 and 4%. It is caused by the passage of a stone through a cholecystoenteric fistula, the terminal ileum is the most commonly affected site. Gallstone ileus occurs more frequently in older women twice as common as men. Mortality rates for this type of mechanical small bowel obstruction may vary between 12 and 27%, due to advanced age, severely impaired general condition, late diagnosis, and comorbidities. CT of the abdomen is the gold standard for an accurate diagnosis. The most frequently described findings include the Rigler's triad: pneumobilia, intestinal obstruction, and the presence of a gallstone in the gastrointestinal tract. We present a case of a 77-year-old woman who was admitted and operated on urgently in our clinic.

Keywords: Cholelithiasis; Gallstone; Mechanical ileus.

Introduction

Gallstone ileus is one of the rarest causes of mechanical small bowel obstruction, with an incidence between 1 and 4% [1,2]. It is caused by the passage of a stone through a cholecystoenteric fistula, subsequently causing a complete blockage of a part of the gastrointestinal tract. The terminal ileum is the most commonly affected site due to its anatomical narrow lumen and less active peristalsis. Gallstone ileus occurs more frequently in older women (>65 years) with a female-to-male ratio of 3.5 to 1 [3]. Mortality rates for this type of mechanical small bowel obstruction may vary between 12 and 27%, due to advanced age, severely impaired general condition, late diagnosis, and comorbidities [3]. CT of the abdomen is the gold standard for accurate diagnosis, and the most frequently described findings include the Rigler's triad, namely: pneumobilia, intestinal obstruction, and the presence of a gallstone in the gastrointestinal tract [4-7].

Case Report

We present a 77-year-old woman with a history of nausea and vomiting for the past 7 days, right flank pain, and asthenodynamia. The following comorbidities were present: chronic renal failure, hypertension, paroxysmal atrial fibrillation, and type II diabetes.

Physical examination revealed an impaired general condition, dehydration, pale skin and mucous membranes, tachycardia and tachypnoea, right upper quadrant and epigastrium pain upon palpation. A nasogastric tube was placed and revealed signs of miserere. Laboratory examination revealed leukocytosis, elevated levels of acute-phase proteins, and increased urea and creatinine. We performed abdominal laterography which showed gas collections along the bowel wall with multiple hydroaeric shadows (Figure 1). A CT scan of the abdomen was performed, which revealed the presence of three stones in the terminal ileum, evidence of small bowel obstruction and pneumobilia resulting from cholecystoduodenal fistula (Figure 2).

The patient was diagnosed with small bowel lithogenic obstruction and underwent emergency surgery. A total midline laparotomy was performed. Chronic inflammation of the gallbladder and cholecystoduodenal fistula, as well as and three gallstones in the terminal ileum were found. A decision to perform an enterotomy with stone extraction, found in the ileum and sized between 2.5 and 3 cm was made (Figure 3). A cholecystectomy was performed and the cholecystoduodenal fistula was excised with subsequent duodenal suture.

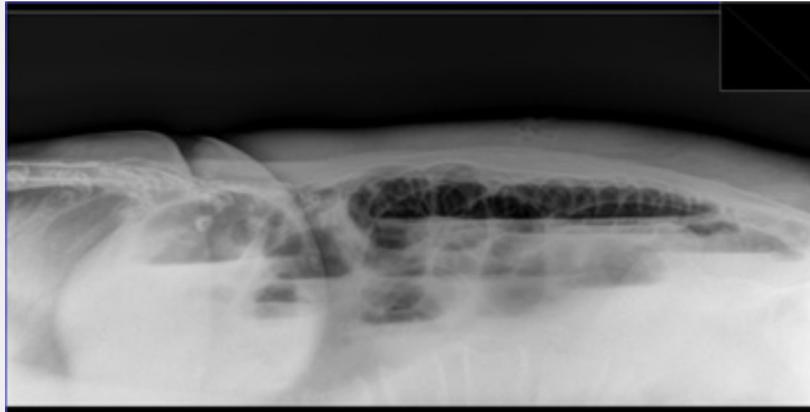


Figure 1: Abdominal X-Ray: Gas collections with multiple hydroaeric shadows.

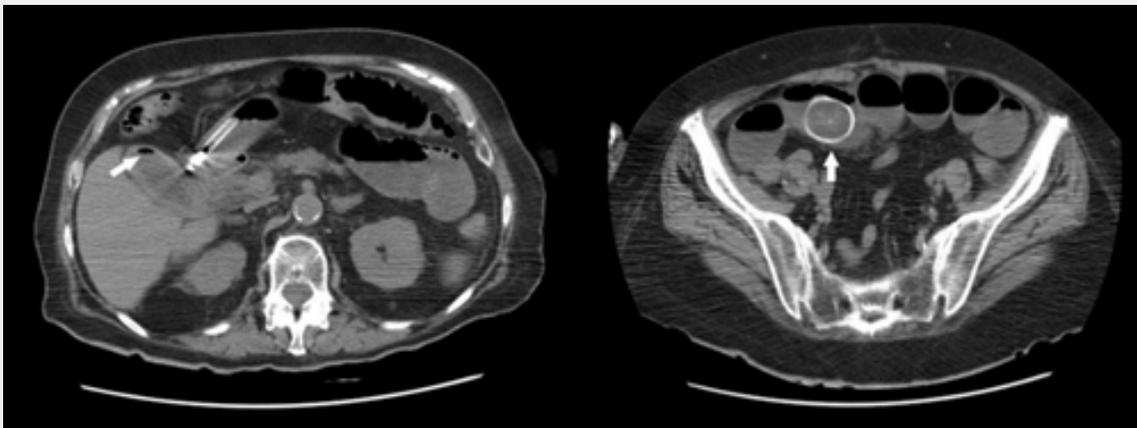


Figure 2: CT of the abdomen: stones in the terminal ileum, evidence of small bowel obstruction, and air in the gallbladder.

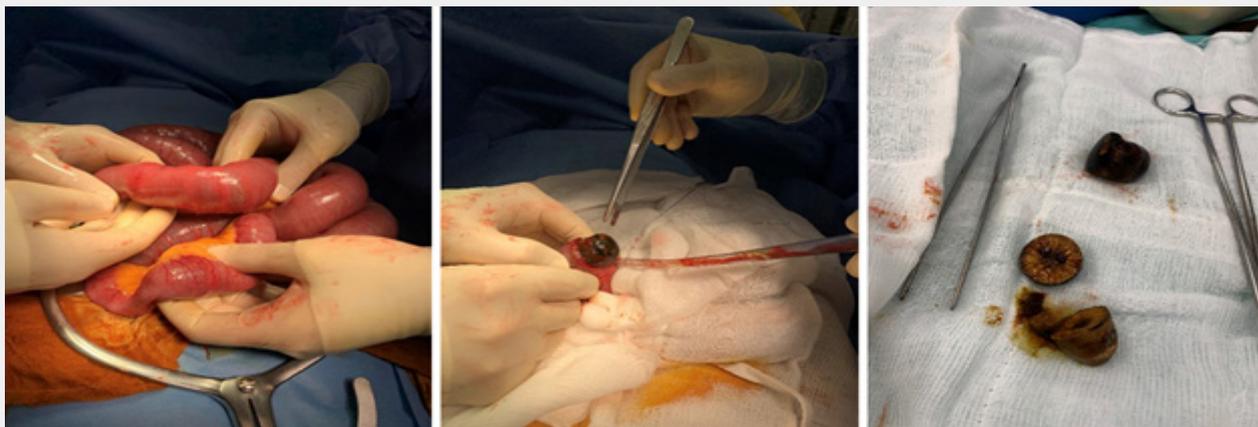


Figure 3: Enterotomy and gallstones extraction.

Discussion

The term lithogenic ileus (gallstone ileus) was first introduced by the Danish physician Thomas Bartholin in 1654 in a patient

he examined at autopsy [8]. It is a type of mechanical intestinal obstruction caused by the migration of one or more large gallstones in the gastrointestinal tract. The main etiological factor for the

development of the disease is the passage of a gallstone through existing cholecystoenteral fistula, resulting in distal obstruction [9,10]. To cause complete obstruction of the passage, the stone must be over 2 cm in diameter. Reisner and Cohen reviewed 1001 cases of gallstone ileus and reported that the impaction of gallstone can occur in any part of the intestinal tract [11]. The most common location is the ileum (60.5%), followed by the jejunum (16.1%), stomach (14.2%), colon (4.1%), and duodenum (3.5% - Bouveret's syndrome). Spontaneous passage of gallstones through the intestinal tract is also possible, and this is observed in 1.4% of all cases [11]. Obstruction occurs at the level of the ileum due to the narrower lumen and slower peristalsis in this section of the small intestine. The formation of cholecystoenteral fistula is one of the rare complications of gallstone disease. The long-term cholecystolithiasis and frequent pain episodes lead to the formation of adhesions between the duodenum (colon, stomach) and the gallbladder. The stone compression and inflammation of the walls of hollow organs may result in cholecystoenteral fistulas. The most common location of fistulas is between the gallbladder and the duodenum [5].

Lithogenic ileus is one of the rarest forms of intestinal obstruction and accounts for less than 0.1% of all cases of mechanical bowel obstructions [12]. The incidence is more than 3 times higher in women. It usually develops in people over 65 years of age with significant comorbidity, which is also the main cause of the associated high mortality (12-27%). The first symptoms of the disease are nonspecific and include nausea, vomiting, and abdominal discomfort, which may be accompanied by pain in the right upper quadrant and epigastrium [3,11,13]. In some patients, the so-called rolling phenomenon could be present. This is the sporadic movement of the stone along with the bowel, caused by intestinal peristalsis. It results in episodes of migratory pain. The non-specific symptoms cause late diagnosis. This condition should be suspected in all patients with a long history of cholecystolithiasis developing such symptoms.

Imaging is the primary diagnostic method. Abdominal radiography usually reveals the Rigler triad, the presence of stones in the intestinal loops, gas collection in the gallbladder (aerobilia) and small bowel obstruction [4-7]. The gold standard for accurate diagnosis is the abdominal contrast-enhanced CT. It has 93% sensitivity and 100% specificity for lithogenic ileus. The main CT criteria for correct diagnosis are: 1) Evidence of obstruction; 2) Ectopic gallstone; 3) Visualization of bilioenteral fistula; 4. Altered structure of the gallbladder with gas collection in its lumen; 5. Aerobilia [5,14-18].

The location of the stoppage is important for the subsequent treatment. If the obstruction is at the level of the duodenum (Bouveret's syndrome) [18] or colon, endoscopic extraction of the stone may be an option [19]. In all other cases, the main therapeutic choice is the surgical approach. There are several types of surgical techniques available for this form of obstruction:

1) Enterotomy with stone extraction; 2) Enterotomy with stone extraction and cholecystectomy; 3) Small bowel resection with stone extraction; 4. Small bowel resection with stone extraction and cholecystectomy. The choice of surgical techniques depends on the patient's general condition and comorbidities [15,16].

Enterotomy with stone extraction is the most preferred option due to the low risk of complications [19,20]. In 50% of all cases, spontaneous closure of the cholecystoenteral fistula occurs. 5% of all patients who undergo this type of surgery have biliary complications, and 10% of all cases require re-surgery. The risk of recurrence of gallstone obstruction if the gallbladder is preserved is between 5 and 17%, and the risk of gallbladder cancer is between 2 and 6% [20]. The main complications in these patients are acute renal failure, urinary tract and wound infections, gastrointestinal complications, anastomotic insufficiency, or placed sutures with subsequent intraabdominal abscesses [4,17].

We performed an enterotomy with the extraction of three stones, cholecystectomy, and closure of the cholecystoduodenal fistula. The enterotomy was performed on the opposite side of the mesentery with a longitudinal incision, the stones were extracted, and the defect was closed with a transverse suture. An antegrade cholecystectomy was performed, the cholecystoduodenal fistula was excised and a duodenal suture was required. No surgical complications were reported in the postoperative period.

Conclusion

Lithogenic ileus is one of the rarest causes of mechanical bowel obstruction and is more common in older women. In patients with multiple comorbidities, the disease presents with non-specific symptoms. This can explain its late diagnosis. The advantages of computed tomography contribute to the accurate and more timely diagnosis. The main method of treatment is surgery, an enterotomy and stone extraction.

Conflict of Interest

We declare no conflict of interest.

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