

Gallstone ileus

Case report and review of literature

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Summary

We report the case of a 59-year-old woman with a 3-day history of abdominal pain and constipation. Plain abdominal X-ray demonstrated dilated bowel loops and a few air-fluid levels in the mesogastrium. Abdominal ultrasound revealed cholecystolithiasis and mild dilatation of bowel loops in the mesogastrium as well. CT scan found a shrunken gall-

bladder with air inside, air in the biliary tree and dilatation of the bowel loops above the intraluminal obstruction represented by a dense formation. Suspicion arose from the CT scan of gallstone ileus. The patient underwent surgery with enterotomy with gallstone extraction. The postoperative course was complicated by haematoma in the incision,

which was resolved by drainage. The patient was released from hospital to home care nine days after surgical intervention.

KEY WORDS: MECHANICAL ILEUS, GALLSTONE, PNEUMOBILIA, RIGLER'S TRIAD

Souhrn

Biliární ileus. Popis případu a přehled literatury

V kazuistice je uveden případ 59leté ženy přijaté pro tři dny trvající bolest břicha a zástavu odchodu větrů a stolice. Na nativním snímku břicha se zobrazily dilatované klíčky tenkého střeva a několik hladinek v mezogastriu. Při abdominální ultrasonografii byla popsána cholecystolitiáza

a taktéž byla zobrazena mírná dilatace tenkých klíčků v mezogastriu. Následně provedené CT břicha prokázalo svaštělý žlučník s přítomností plynu, který se objevil i ve žlučových cestách, dále byla popsána dilatace klíčků tenkého střeva nad intraluminálně uloženým denzním útvarom. Právě z CT obrazu bylo vysloveno podezření na biliární ileus. Pacientka podstoupila

enterotomii s extrakcí konkrementu. Pooperační průběh byl komplikován vznikem hematomu v jizvě, který byl vyřešen drenáží. Nemocná byla po devíti dnech propuštěna do domácí péče.

KLÍČOVÁ SLOVA: MECHANICKÝ ILEUS, BILIÁRNÍ KONKREMENT, PNEUMOBILIE, RIGLEROVA TRIÁDA

Gallstone ileus accounts for 1–4% of all cases of mechanical intestinal obstruction, but for up to 25% of patients over 65 years old with a female predominance (female to male ratio of 3.5–6 : 1) [6,9]. The youngest person reported in literature was a 13-year-old and the oldest was 97 years of age [11]. Gallstone ileus is also a rare complication of cholelithiasis (0.3–0.5%), but potentially very serious. The morbidity and lethality rate of gallstone ileus remains very high (the lethality rate ranges from 8 to 30%) because of the predominance of elderly patients with co-morbidities and due to a delay in diagnosis (or misdiagnosis) as clinical symptoms and signs are non specific [10].

CASE REPORT

A 59-year-old woman was presented with a 3-day history of intermittent pain in the epigastrium with propagation to the upper right quadrant of the abdomen (she had similar symptoms in the past). She also had constipation for three days and abdominal distension but no flatus passed for one day. There was no fever or shivering and there was no dark urine or pale stool. On physical examination, her abdomen was soft with tenderness in the epigastrium and left mesogastrium. Laboratory tests showed elevation of gamma glutamyltransferase (8.23 μ kat/L), aspartate aminotransferase (1.11 μ kat/L), C-reactive protein (143 mg/L) and white blood count $19 \times 10^9/L$. The

other laboratory tests were unremarkable. Plain abdominal X-ray demonstrated dilated intestinal loops up to 35 mm and few air-fluid levels in the mesogastrium. Abdominal ultrasonography showed cholecystolithiasis, mild dilatation of bowel loops in the mesogastrium and no dilatation of the biliary tree. CT scan was performed and demonstrated a shrunken gallbladder with internal air, air in the biliary tree and dilatation of the bowel loops above the intraluminal obstruction represented by a dense formation (Fig. 1–3). Intestinal loops below this corpuscle were collapsed. The patient was given antibiotics (ciprofloxacin) and was transferred to the surgical department for urgent laparotomy. At



Fig. 1.
A case of gallstone ileus. Typical aerobilia (arrow) was found at CT scan.



Fig. 2.
CT scan. Impacted gallstone in the ileum (arrow).



Fig. 3.
A case of gallstone ileus. Dilated intestinal loops (arrow) due to mechanical intestinal obstruction and collapsed loops downstream (arrowhead). CT scan.

surgery, a dilated ileum up to 3 cm in diameter and impacted gallstone measuring 4 × 3 × 2 cm in diameter were found in the ileum, but because of many adhesions to the right ovary it was not possible to identify the distance to the ileo-caecal valve. Enterotomy with extraction of the gallstone was performed. The postoperative course was complicated only by a haematoma in the incision (upper middle laparotomy). The haematoma was drained off. The patient was

released from hospital to home care nine days after surgery.

DISCUSSION

We present a remarkable case of gallstone ileus as a rare cause of mechanical bowel obstruction. The more common causes of mechanical ileus include adhesions, strangulation of a hernia, a malignant tumour, intussusception or volvulus [3].

The obstructing stone or stones originate from the gallbladder, although gallstone ileus has in rare cases been reported in the presence of agenesis of the gallbladder [10]. Episodes of recurrent calculous cholecystitis usually result in extensive inflammation and adhesions between the gallbladder and the gastrointestinal tract. This facilitates formation of cholecysto-intestinal fistula and eventual passage of a gallstone to the gut. Usual anatomical predilection is into the duodenum, resulting in cholecysto-duodenal fistula (in 60–86%), but the fistula can occur anywhere in the gastrointestinal tract including the stomach, colon, jejunum and ileum [7,11]. Cases of gallstone ileus after endoscopic sphincterotomy were also presented in the literature [8]. Then the stone passes through the fistula into the gastrointestinal tract. After that, the stone can pass through or cause obstruction or, in rare cases, it can be expelled by vomiting. Spontaneous passage of gallstone was reported in only 8 to 112 patients in a review of the Japanese literature [11]. Gallstones smaller than 2 cm in diameter usually pass through spontaneously, those larger than 5 cm are more likely to become impacted. But stones smaller than 2 cm may not be innocuous, they may become larger by accretion as they descend the intestinal tract and produce reflex spasm and volvulus. The site of stone impaction can be anywhere in the gastrointestinal tract but most often happens in the terminal ileum and ileo-caecal

valve, rarely in the jejunum, duodenum, pylorus - in this case it is called Bouveret's syndrome [15] - and the colon [4]. The presence of strictures or other abnormalities in the intestinal lumen, causing it to be narrower than usual, will also increase the chance of stone impaction [13]. In our case, the gallstone was found in the ileum, but it was not possible to identify the exact place of impaction because of adhesions to the right ovary.

Symptoms and signs of gallstone ileus are non-specific [2,9]. Due to this, there is usually a delay in making the diagnosis and authors usually refer to three days [11]. The clinical manifestation may be acute, intermittent (as a result of the passage of the stone - this is called the tumbling phenomenon) [11] or chronic. There are often characteristic signs of small bowel obstruction including epigastric pain, distension, nausea and vomiting. Moreover a small number of patients may be presented with haematemesis secondary to duodenal erosion. Patients may also be presented with fluid and electrolyte imbalance, anorexia and weight loss in the cases of a chronic course of the illness. A recent acute biliary episode frequently precedes the onset of gallstone ileus [10]. Laboratory studies may show an obstructive pattern with elevated values of bilirubin, alkaline phosphatase and gamma glutamyl transferase.

Diagnosis of gallstone ileus usually depends on the radiographic findings, where the basis used is the classical Rigler's triad: pneumobilia (Fig. 1), ectopic gallstone within the bowel lumen (Fig. 2) and mechanical intestinal obstruction (Fig. 3) [2]. We registered this typical triad in our case as well. Plain abdominal radiographs used to be considered as the gold standard for many years. The classical Rigler's sign occurs in less than 10% of cases on abdominal films [2,11,13]. These usually show non-specific fin-

dings because only 10% of gallstones are calcified enough to be visualised radiographically. Ultrasound and CT scans are more efficient than plain abdominal X-ray alone and may determine correct diagnosis earlier. Lassandro et al compared the clinical value of plain abdominal films, abdominal ultrasonography and CT scans in diagnosing 27 cases of gallstone ileus and found that the Rigler's triad was present to the level of 10% in plain abdominal X-rays, 11% in abdominal ultrasonography and 78% in abdominal CT. Ultrasonographic diagnosis is possible but difficult because the gallbladder is usually collapsed, filled with air or both [13]. CT plays an important role in detection of other stones that have not yet become impacted. During CT scans, we should look for evidence of small bowel obstruction – fluid overdistension of the loops above the impacted stones and collapsed loops downstream – the presence of an ectopic endoluminal stone, its size and location, pneumobilia, direct visualisation of biliary-enteric fistula and other stones throughout the intestinal tract because multiple stones can be expected in 3–44% of all patients with gallstone ileus. There are reports published in the literature of a recurrent gallstone ileus 1–6 months after enterotomy without cholecystectomy. The information obtained on CT is used to make a rapid diagnosis. Recurrent gallstone ileus is a mechanical intestinal obstruction secondary to occlusion of the intestine by an intraluminal gallstone that was present but not obstructing at the time of a previous episode of ileus or secondary to the passage of new stones from a pre-existing, not surgically treated fistula. This happens at a rate of 5% [10]. Any delay in diagnosis and treatment may lead to serious complications such as electrolyte imbalance, ischaemic lesions, ulcers of the bowel, abscess formation and also free perforation and peritonitis.

The goal of treatment of gallstone ileus is early relief of intestinal obstruction to minimise morbidity and lethality. It is important to pay great attention to correction of fluid and electrolyte imbalance [2]. In patients with typical gallstone ileus with small bowel obstruction, early surgery is indicated to relieve the obstruction. The choice of surgical procedure for gallstone ileus is still a matter of debate. The question is whether to use a one-stage procedure, a two-stage procedure or enterolithotomy alone. The one-stage surgical procedure includes enterolithotomy, cholecystectomy and fistula repair. The two-stage procedure involves an initial enterolithotomy as an emergency operation followed by cholecystectomy and fistula closure 4–6 weeks later. Enterolithotomy alone has been shown to be associated with low morbidity and papers also exist reporting spontaneous fistula closure in up to 50% [2,5]. The recurrence rate of gallstone ileus after simple enterolithotomy is about 5%. The reported lethality rate for gallstone ileus after enterolithotomy is about 12% and that for one-stage surgical intervention about 17% [2]. Small bowel resection and anastomosis is another therapeutic option in patients with an impacted gallstone that caused irreversible damage of the intestinal wall or that cannot be dislodged [8]. However, the lethality rate of small bowel resection for gallstone ileus is about 66%. Therefore it is reasonable to recommend that the one-stage procedure should be reserved only for low-risk patients with absolute indications for cholecystectomy and fistula closure [2]. Laparoscopic techniques can be used as well. Cholecystectomy in patients with gallstone ileus is usually technically demanding, due to the multiple episodes of cholecystitis, leading to the formation of adhesions between the gallbladder and adjacent hollow viscera (mainly the duodenum

and more rarely the colon), and eventually to the establishment of a pathologic communication between the gallbladder and the lumen of the gastrointestinal tract (biliary-enteric fistula). This can explain why open cholecystectomy is often required in these patients. During surgery the entire length of the bowel should be examined for additional stones, owing to 10 to 40% incidence of multiple stones within the gastrointestinal tract [12].

Successful non-surgical treatment of gallstone ileus was also mentioned in the literature, including effective extra-corporeal shock wave lithotripsy or electrohydraulic lithotripsy of obstructing stones at endoscopy [8]. Although surgery is the treatment of choice in cases of colonic gallstone ileus, colonoscopic removal of the impacted stone should be attempted first. Gallstone obstruction of the large bowel is a rare condition, in which the stone almost always impacts at the level of the sigmoid colon, usually due to a pathologic narrowing at that point (e.g. history of diverticulitis) [1]. Cases are also described of laser lithotripsy of sigmoid colon gallstone impaction [14].

CONCLUSIONS

Gallstone ileus is a frequently misdiagnosed clinical entity because the symptoms and signs are non-specific. According to the data gained from literature, a good diagnosis is made before surgical intervention in 26–50% of cases. CT allows for correct diagnosis of gallstone ileus with a higher accuracy.

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