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Case Report

Gallstone ileus - the double challenge: case report and review of the literature

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Abstract

Gallstone ileus is a rare condition which occurs as an evolutive complication of biliary lithiasis. It occurs after stone migration from extrahepatic biliary tree to the digestive lumen, mostly through a biliary-enteric fistula. This condition involves repeated inflammatory relapses with the formation of local adhesions and generally requires a long evolution. The vast majority of patients with biliary ileus are third aged women who often have concomitant medical illnesses.

Gallstone ileus surgery deals with the two components: bowel obstruction and biliary pole. Obstruction solving is approached as a surgical emergency and it requires an attitude adapted to the local situation. The attitude towards biliary surgery for gallstone ileus is a matter in debate. It could be one-stage surgery, elective surgery or expectancy and its choice is imposed by both local and general condition of the patient.

We report the case of a middle-age woman whose first symptom of cholelithiasis was the gallstone ileus. Plain upright abdominal radiography revealed air-fluid levels with distended loops of the small bowel and pneumobilia. Laparotomy was decided and exploration revealed an impacted gallstone into the ileum and dense adhesions were found under the liver region. Enterolithotomy for gallstone removal was made. Postoperative evolution was uneventful with discharge on 7th day.

Keywords: gallstone, ileus, fistula

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Introduction

Gallstone ileus is a rare cause of obstruction which occurs as an evolutive complication of biliary lithiasis. Mostly, its pathogenesis requires a long evolution and development of a biliodigestive fistula with consecutive migration of the gallstones into the digestive lumen.

The pathological biliodigestive connexion occurs after repeated inflammatory relapses with formation in a first stage of adhesions between the gallbladder and adjacent organs then followed by fistula formation.

Most commonly, the gallbladder partner in these fistulas is the duodenum but communications are possible with the stomach, the small intestine or the colon. In rare cases the biliary pole is represented by the choledocus. There are reported cases of developing biliary ileus after ERCP or passing spontaneously through the ampulla of Vater (1, 2).

Small stones can pass through the gut without symptoms and can be eliminated with faeces. It is considered that the stones must have a diameter greater than 2.5 cm in order to obstruct the intestinal lumen, although exceptions are possible in a way and in the other (3, 4).

Gallstones can block the intestinal lumen at various levels. The impaction of gallstones into the duodenum defines a particular form of high occlusion described as Bouveret syndrome (5). Stones stop usually in the terminal ileum due to the smaller diameter, rarely in jejunum or in colon (6, 7).

Pathogenesis and clinical expression give particular aspects to the biliary ileus and at the same time the surgical attitude is eclectic. Surgical procedure is imposed by the specific situations in order to resolve obstruction while the attitude towards the biliary pole is still an object of debate.

Case Report

A 52-year-old obese female (BMI 39,79 kg/m2) with no significant past medical history was admitted for cramp abdominal pain, nausea and vomiting.

These symptoms had an abrupt onset three days before admission having intermittent reliefs but accentuated in the day of presentation.

Physical examination revealed a moderately distended abdomen with tympanic sounds on percussion. Digital rectal examination was normal. A nasogastric tube was placed for decompression.

Figure 1. Pneumobilia and air-fluid levels

Plain upright abdominal radiography revealed air-fluid levels with distended loops of the small bowel and pneumobilia (Figure 1).

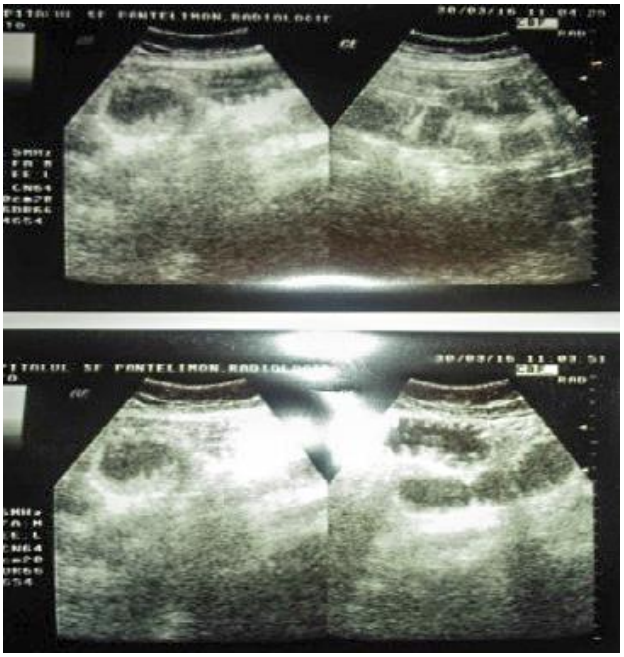

Figure 2. Ultrasonography - distended bowel loops.

Findings on ultrasonography were fluid-filled distended bowel loops. The gallbladder and bile ducts could not be assessed (Figure 2).

Laboratory evaluation revealed slightly elevated level for urea - 58,26 mg/dl and leucocytosis: 11.691/mm3. Celiotomy was decided for bowel obstruction. Operative exploration revealed distended small bowel loops up to the terminal ileum where an impacted gallstone was found (Figure 3).

Figure 3. Impacted gallstone into the terminal ileum

Dense adhesions were found under the liver region not allowing the identification of local anatomical structures. It was decided to limit surgery to enterolithotomy. A gallstone of 2,5/5 cm was extracted after upstream mobilization (Fig 4). Enterotomy was closed in two layers using continuous suture. Postoperative evolution was uneventful with discharge on 7th day.

Figure 4. Gallstone extracted

Discussion

The incidence of gallstone ileus is closely linked to the geographical incidence of cholelithiasis. Biliodigestive fistula forming as a mandatory stage for migration of the gallstones requires a long evolution.

The vast majority of patients with biliary ileus are women with an average age of 68-70 who often have concomitant medical illnesses (8). Gallstone ileus is rare representing less than 0.5 percent among the mechanical causes of obstructions for the small bowel and only 0,095% considering all mechanical bowel obstructions (9).

The symptomatology is dominated by nausea, vomiting and abdominal distension which may have partial and temporary remissions depending on the possibility to the gallstone to be disimpacted and the bowel spasm to be diminished. Peristalsis propels the gallstone producing a new episode of impaction.

In these conditions clinical expression can have sometimes an atypical character leading to delay in diagnosis and treatment. Ileus can occur after an episode of acute cholecystitis that, apparently paradoxical, may improve spontaneously once the biliodigestive fistula is constituted.

There are cases in which intestinal obstruction is the first manifestation of an asymptomatic cholelithiasis (3). Abdominal imaging is needed to support the diagnosis of occlusion and to find its cause. The plain upright abdominal radiography displays air-fluid levels that are characteristic of intestinal obstruction.

Regarding the etiology of occlusion, in plain radiography biliodigestive fistula can exhibit pneumobilia, but the presence of stones into the bowel lumen is often overlooked because these are frequently radiolucent and less than 15% of gallstones are visible on the plain abdominal film (10).

On a plain radiography, findings of intestinal obstruction associating pneumobilia and ectopic radio opaque gallstone define the Rigler triad which is

highly suggestive of gallstone ileus but described in a limited number of cases (11).

Abdominal ultrasound has important limitations in exploring a patient with occlusion because of massive air distension. Besides the distended fluid-filled bowel loops, a thorough examination can identify the presence of gallstones inside the intestinal lumen (12).

In these circumstances ultrasound has also limitations in exploring the gallbladder. Although ultrasound is indicated in principle to evaluate the residual cholelithiasis, the scleroatrophic chronic cholecystitis, often found in biliodigestive fistulas, intestinal gas and subhepatic adhesions make ultrasound exploring to be often inconclusive.

Abdominal computed tomography provides the best diagnostic information for gallstone ileus so it is the imaging modality of choice. It proves to be superior to ultrasound and radiography to identify the Rigler's triad features: pneumobilia, intestinal obstruction and obstructing gallstones (13, 14).

The therapeutic attitude in gallstone ileus is an eclectic one and needs to be adjusted depending on various factors: diagnostic accuracy, logistics availabilities, the patient's condition and comorbidities and intraoperative findings.

Each of the two components of the gallstone ileus – the bowel obstruction and the biliary component – requires an adapted attitude hence the variety of therapeutic possibilities but also the sources of debate. The poor state of the patient makes in certain circumstances that a surgical treatment cannot be tolerate.

There have been reports of spontaneous evacuation of voluminous stones which caused a transient ileus but these situations require an accurate etiological diagnosis and surgical vigilance (15).

Endoscopy as a method of gallstone removal can be used when the site of impaction is accessible such as colon or in Bouveret syndrome. In order to achieve mechanical stone fragmentation, laser or electrohydraulic lithotripsy can be used (16-18).

When the place of stone impaction is situated more distally the double-balloon endoscopy can be an option (19). Extracorporeal shock wave lithotripsy (ESWL) for stone fragmentation in gallstone ileus is rarely used because of its highly costs (20).

Gallstone removal is typically achieved with an enterolithotomy via a laparotomy. The site of stone impaction might expose some ischemic changes which can compromise the closure of the enterotomy. That's why it is preferable to do the enterotomy proximally and the stone mobilised upstream and removed.

Downstream mobilisation of the gallstone implies risks of mucosal or serosal injuries and it is not recommended (8). Bowel resection is imposed when the stone cannot be dislodged or the intestinal wall exposes irreversible lesions.

Although laparoscopy has limitations in a situation of a gallstone ileus and conversion to laparotomy is frequent, experienced surgeons can perform enterolithotomy or disimpaction of the gallstone and address to biliary pole at the same time (21-23).

In order to resolve bowel obstruction, the surgical procedure must be adapted to local and general conditions. Thus ileo-transverso-anastomosis, gastrotomy, duodenotomy, Hartmann resection, subtotal colectomy, colostomy or resection with ileo-ascendento-anastomosis are described as solutions to solve the obstruction (24-26).

In some cases, atypical but less risky procedures are necessary. It is cited a case of stone mobilization from sigmoid and its retrieval via cecum through a modified appendectomy (27).

The attitude towards biliary component of gallstone ileus is still a matter in debate.

The conservative attitude toward biliodigestive fistula is justified by the observation that it may close spontaneously if the cystic duct is patent and there is no residual cholelithiasis (28).

On the other hand, a persistent fistula carries risks of recurrent gallstone ileus, cholecystitis and cholangitis. Fistula closure in a one-stage procedure

can be performed in selected cases – low-risk patients ASA score I or II, with no dense adhesion or severe inflammation (29-31).

Elective biliary surgery is preferable due to a lower mortality and morbidity. In high-risk patients - ASA score III and IV - cholecystectomy and fistula closure are imposed by cholelithiasis or recurrent gallstone ileus but in the absence of recurrence of symptoms these patients can be managed expectantly.

Conclusions

Gallstone ileus is a rare cause of obstruction especially in middle-aged patients. The etiology of the obstruction is revealed preoperatively in a limited number of cases. Abdominal CT is the investigation of choice for diagnosis of gallstone ileus.

The surgical attitude is an eclectic one and adapted to local and general conditions of each patient. In order to resolve obstruction which represents an emergency a broad spectrum of surgical and non-surgical solutions can be carried out.

Biliary surgery in gallstone ileus is still a matter in debate. Cholecystectomy and fistula closure can be performed at the same time with the procedure for obstruction but it is prudent to be done in selected patients with no dense adhesion or severe inflammation. Lower morbidity and mortality occur in elective biliary surgery. Expectancy may be an option for high-risk patients.

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