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Case Report

Acute Obstructive Abdomen Due to Gallstone Ileus: Case Report and Literature Review

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Abstract: Gallstone Ileus is a rare complication of cholelithiasis and one of the rarest forms of mechanical intestinal obstruction. It occurs in 0.3% to 0.5% of patients with cholelithiasis and is responsible for 1% to 4% of cases of mechanical obstruction. It is caused by the impaction of gallstones in the gastrointestinal tract after passing through biliary-enteric fistulas. The diagnosis is often delayed or missed due to the non-specificity of symptoms, leading to a reserved prognosis with high mortality and morbidity rates. Although the treatment and management of gallstone ileus remain controversial, the primary therapeutic goal is the extraction of the stone through a surgical approach. This case aims to describe a rare instance of intestinal obstruction due to gallstone ileus, where the stone was eliminated with clinical measures combined with surgery to correct a choledochoduodenal fistula.

Keywords: Intestinal Obstruction; Acute Abdomen; Fistula.

1. Introduction

Gallstone Ileus is a rare complication of cholelithiasis and one of the rarest forms of mechanical intestinal obstruction. The condition affects, on average, 0.3% to 0.5% of patients diagnosed with cholelithiasis [1], with a recurrence rate of approximately 8.2%, with more than 50% occurring in the first month after the initial episode, and the rest within up to two years [2]. It accounts for less than 0.1% of cases of mechanical obstruction and 1-4% of cases of non-strangulating mechanical obstruction of the small intestine [3].

The disease is currently described as resulting from the impaction of gallstones in the lumen of the gastrointestinal tract, occurring mainly through biliary-enteric fistulas, with the duodenum being the major destination. Elimination can occur from the gallbladder to the colon or stomach or, in extremely rare cases, naturally through the biliary duct, involving the passage of the gallbladder to the common bile duct and subsequently to the ampulla of Vater [4]. However, this pathology remains a clinical and surgical challenge, presenting high mortality rates, fluctuating between 12% and 20% of diagnosed patients [5].

Diagnosis is often delayed or missed due to the lack of specificity of symptoms related to gallstone ileus, such as intermittent abdominal pain, varying abdominal distension, nausea, and vomiting [1]. In some cases, the phenomenon known as "tumbling" is observed, where symptoms are generated only by the movement of gallstones in the gastrointestinal tract, producing intermittent symptoms and further complicating the investigation [6]. In addition to the previous difficulties, the vast majority of patients are elderly, with a wide range of comorbidities and poor general condition, favoring the occurrence of complications such as dehydration, peritonitis, sepsis, and septic shock [7].

Investigation through laboratory and imaging tests also has limitations. Laboratory changes are non-specific, such as a slight increase in total bilirubin and changes in liver enzymes [1]. Abdominal Computed Tomography with contrast achieves high sensitivity (93%), specificity (100%), and accuracy (99%) in diagnosing gallstone ileus [3]. Although the treatment and management of gallstone ileus remain controversial, the primary therapeutic goal is the extraction of the stone through a surgical approach [8]. Gallstone ileus involves three main elements: cholelithiasis, biliary-enteric fistula, and intestinal obstruction. Cholelithiasis and the fistula are typically treated by removing the stone and closing the fistula. The removal of stones usually promotes intestinal decompression. The ideal step-by-step approach for surgical intervention still lacks consensus, currently offering three possible approaches: 1) Simple enterolithotomy; 2) Enterolithotomy, cholecystectomy, and fistula closure in one procedure; and 3) Enterolithotomy with cholecystectomy at a later stage [9].

Despite the treatment and diagnostic options, gallstone ileus remains a condition with a reserved prognosis and high rates of mortality and morbidity, as described in this rare complication in the present case.

2. Case Report

A 78-year-old previously healthy man was referred to a specialized hospital on October 15, 2023, due to an acute abdomen associated with an external X-ray showing the "coin stacking" sign. Upon admission, he presented with right upper quadrant pain associated with postprandial vomiting. He denied fever, acholia, choluria, melena, and hematemesis. He had a history of one episode of biliary colic due to cholelithiasis seven years ago, treated clinically, with no intestinal changes or other complaints. Initially, clinical measures for obstructive acute abdomen were instituted, including nasogastric tube insertion, hydration, and antibiotic therapy. After the patient's stabilization, a contrast-enhanced CT scan of the abdomen and pelvis was performed, as illustrated below (Figure 1 and Figure 2).

Following the initiation of clinical measures, an urgent operating room was requested as the initial therapeutic plan. The estimated time in the operating room was initially six hours, and the patient was kept under intensive observation. After a few hours of observation, the patient experienced a return of intestinal transit and had large bowel movements. The output from the nasogastric tube decreased to a negligible amount. It was then decided to repeat the CT scan, as the patient was stable and without organ dysfunction. It was observed that the stone had migrated beyond the ileocecal valve and was already in the descending colon, as demonstrated below (Figure 3).

As soon as the progression of the stone was verified in the sequence of examinations performed, it was decided to maintain only clinical measures and observe the fecal elimination of the stone after a few more hours. Due to the patient's good progress, compensated comorbidities, and good nutrition, we decided to correct the cholecystoduodenal fistula during the same hospital stay, five days after the acute event, as shown in the figure below.

Figure 1. Contrast-enhanced computed tomography image in the arterial phase shows distension of small bowel loops associated with a hyperdense image within a loop located in the right flank (white arrow), compatible with a gallstone. Aerobilia is also noted in the left tomographic section.

Figure 2. Contrast-enhanced computed tomography showing aerobilia (white arrow).

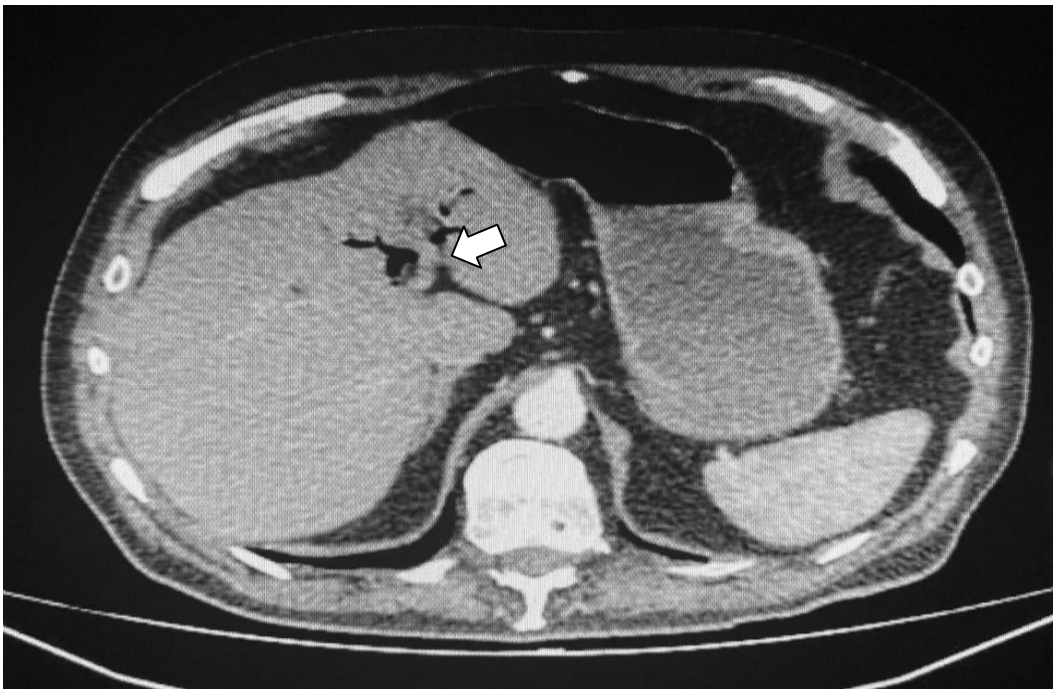
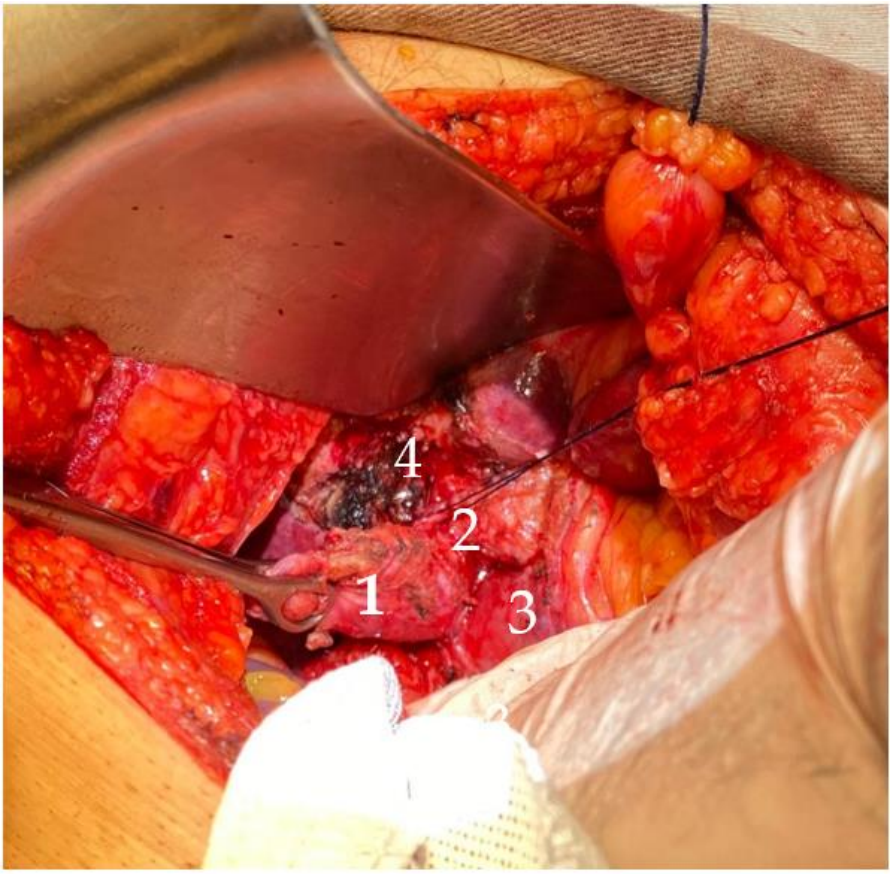


Figure 3. Contrast-enhanced computed tomography showing aerobilia (white arrow).

Figure 4. Laparotomy image showing the fundus of the gallbladder (1) held by a Collis clamp, attached only by the main bile duct through the cystic duct repaired with a suture (2). Immediately below is the cholecystoduodenal fistula (3). The cauterized hepatic bed is visible immediately below the retractor (4).



In the surgical approach, a supraumbilical midline incision was made, revealing the abdominal cavity with intense inflammatory processes between the loops of the small intestine, gallbladder, and main bile duct. The gallbladder appeared sclerotic, with thickened walls. A fistula between the duodenum and the gallbladder infundibulum was found, and dissection was performed to release the adhesions of the gallbladder, cystic artery, and repair of the cystic duct. The gallbladder was dissected, allowing for the resection of the cholecystoduodenal fistula. Subsequently, the cystic duct was sutured at the insertion of the common bile duct, and the duodenum was sutured with continuous stitches in two layers. At the end of the approach, the cavity was revised, and hemostasis was achieved with the placement of a tubulolaminar drain in the hepatic bed, exiting through a counter-incision in the right flank. After the surgical procedure, the patient was discharged with drainage and scheduled for outpatient follow-up. No postoperative complications were observed, and the patient continued follow-up. The patient remains well to this day, without postoperative complications.

3. Discussion

Gallstone ileus occurs in 0.3% to 0.5% of patients diagnosed with cholelithiasis [1] and in less than 0.1% of cases of obstructive acute abdomen [9]. When present, it is usually preceded by a history of cholelithiasis, recurrent cholecystitis, or stones larger than 2 cm. At diagnosis, the patient in this report had only one previous episode of biliary colic due to cholelithiasis and none of cholecystitis, which contrasts with the risk factors reported in the literature [7]. The clinical presentation of gallstone ileus is variable. It can produce acute, recurrent, or chronic episodes of intestinal obstruction, with nausea, vomiting, abdominal pain, and distension being common [8]. In agreement with Guzmán et al., 2019 [7], the case was marked by symptoms of complete intestinal obstruction with nausea and vomiting.

According to Souza et al., 2018 [8], for the diagnosis of gallstone ileus, a simple X-ray can indicate the presence of air-fluid levels but is not useful in identifying the stone. Our patient had an abdominal X-ray performed in the emergency unit, showing the "coin stacking" sign, characteristic of high intestinal obstruction. For the recognition of gallstone ileus, Souza et al., 2018 [8], recommend contrast-enhanced computed tomography to identify pneumobilia, which indicates the presence of gas in the biliary tree generated by the fistula. In some cases, it is possible to identify Rigler's triad: small bowel obstruction, pneumobilia, and ectopic gallstone, a triad present in our case. According to a study conducted by Reisner and Cohen, 1994 [5], the main sites of stone impaction are the ileum (60.5%), followed by the jejunum (16.1%), stomach (14.2%), colon (4.1%), and duodenum (3.5%). In our patient, in the first CT scan performed in the service, the stone was present in a jejunal loop, causing obstruction in the entire downstream segment. Through clinical measures taken during hospitalization, the stone moved to the colon and was eliminated.

Nonoperative management is a therapeutic option, provided the patient has clinical conditions and the stone is less than 25 mm, as established by contrast-enhanced tomography [10]. In our patient's case, the resolution of the obstruction was unexpected by the team but prompted discussions. Possibly due to the stone's small size, the decompression through the nasogastric tube, and the patient's clinical stabilization, including electrolyte correction, the intestinal transit moved the stone in such a way that it was possible to pass through the ileocecal valve. However, the ideal treatment recommended in the literature is surgical [11]. Currently, there are two methods. The first involves only correcting the obstruction caused by the stone through enterotomy followed by manual extraction of the stone, with possible resection of the next intestinal segment that was devitalized due to the stone's presence [12]. The second method includes the first method, combined with fistula repair and cholecystectomy [13]. Our patient underwent the second method partially, as the removal of the stone was not necessary because it was expelled before the emergency procedure. Therefore, the cholecystoduodenal fistula was repaired, followed

by cholecystectomy. However, Turner et al. [3] advocates that the safest procedure is enterotomy followed by decompression since most patients are not in good general condition, often having comorbidities and a late diagnosis. All these factors combined make patients prone to developing dehydration, peritonitis, sepsis, and even shock [8].

4. Conclusions

Although the surgical management of obstructive acute abdomen is well-established in the medical literature, the rare complication of gallstone ileus leading to this condition still generates controversies and diagnostic challenges, with no consensus on treatment [14]. This case highlights the possibility of initial clinical treatment for gallstone ileus depending on well-established criteria, such as the patient's clinical stability, stone size, intensive and serial monitoring of evolution, and the availability of a full-time surgical team.

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Research Ethics Committee Approval: The research project was approved by the institution's ethics committee, under the consolidated opinion (CAAE) number 80020724.1.0000.0103, opinion number 6.874.541. The authors declare that no personal patient data were shared in the case report, and the patient authorized the writing and publication of the case through signing the Informed Consent Form (ICF).

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Conflicts of Interest: The authors declare no conflicts of interest.

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