



Case report

Small bowel obstruction secondary to gallstone ileus: An unusual presentation of cholelithiasis

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ABSTRACT

Introduction and importance: Gallstone ileus remain a rare but significant cause of small bowel obstruction, especially in the elderly population. It is associated with high mortality due to nonspecific symptoms and delayed diagnosis.

Case presentation: A 69-year-old male with a history of cholelithiasis presented with symptoms and signs suggestive of small bowel obstruction. Computed tomography (CT) scan showed pneumobilia, and small bowel obstruction, suggestive of gallstone ileus. Initial management involved exploratory laparotomy with enterotomy and gallstone removal followed by cholecystectomy and fistula closure three months later.

Clinical discussion: Gallstone ileus results from large gallstones causing mechanical intestinal obstruction, often via a cholecysto-intestinal fistula. CT scans are crucial for diagnosis, with surgical options for better patients' outcomes. Management of gallstone ileus involves removing the obstruction and repairing the cholecysto-intestinal fistula, but surgical approaches vary based on patient factors.

Conclusion: Surgeons should be aware of the variable clinical presentations and the rationale behind choosing either a one-stage or staged surgical approach, particularly in managing patients with fistulas or severe adhesions.

1. Introduction

Gallstone ileus is a rare form of mechanical bowel obstruction resulting from the impaction of a gallstone within the gastrointestinal tract (GIT), occurring in 0.15 %–1.5 % of cholelithiasis. It is more prevalent among older patients, with up to 25 % of cases occurring in individuals aged over 65 years, with a female-to-male ratio ranging from 3.5 to 6:1 [1,2]. The nature and extent of obstruction often leads to nonspecific and intermittent signs and symptoms. Clinical examination is consistent with bowel obstruction, including dehydration, nausea, vomiting, abdominal distension, pain, and high-pitched bowel sounds [3]. Patients may delay seeking medical attention due to the “tumbling phenomenon,” where symptoms briefly improve as a gallstone dislodges and then recurs when it obstructs again [3,4]. This often leads to late diagnosis, leading to complications such as dehydration, shock, sepsis, or peritonitis [4,5]. This delay contributes significantly to the high

mortality rate of 12 % to 27 %, primarily due to nonspecific symptoms, inconclusive tests, frequent misdiagnosis, and delayed recognition [6].

Adhering to Surgical Case Report (SCARE) guidelines [7], we present a case of a 69-year-old male with gallstone ileus caused by an impacted gallstone in the ileum, requiring surgical intervention for resolution of symptoms.

2. Case presentation

A 69-year-old male presented to emergency department with lower abdominal pain for a week and the absence of bowel movements and flatus for 3 days. The abdominal pain was continuous and, for the last 2 days, associated with vomiting and abdominal distension. He had been incidentally diagnosed with cholelithiasis during a routine general health examination 2 months earlier. He had no fever, evidence of biliary peritonitis or jaundice or significant weight loss, and had no

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history of prior surgical interventions.

Upon examination, the patient was afebrile with stable vital signs. His abdomen was distended with tenderness in the periumbilical region, with audible tympanic and high-pitched bowel sounds. Rectal examination revealed normal findings.

Laboratory investigations showed a total leukocyte count (TLC) of 5000/ μ L (reference range: 4000–11,000/ μ L), hemoglobin: 13.5 g/dL (reference range: 12–16 g/dL), platelet count: 277,000/ μ L (reference range: 150,000–450,000/ μ L). Renal function tests showed urea level of 22 mg/dL (reference range: 7–20 mg/dL), creatinine of 1.0 mg/dL (reference range: 0.7–1.3 mg/dL), sodium at 138 mmol/L (reference range: 135–145 mmol/L) and potassium at 4.2 mmol/L (reference range: 3.5–5.0 mmol/L). Liver function tests were unremarkable, with total bilirubin at 0.8 mg/dL (reference range: 0.1–1.2 mg/dL), direct bilirubin at 0.3 mg/dL (reference range: 0.0–0.4 mg/dL), alkaline phosphatase at 85 U/L (reference range: 44–147 U/L), gamma-glutamyl transferase (GGT) at 35 U/L (reference range: 9–48 U/L), aspartate aminotransferase (AST) at 28 U/L (reference range: 10–40 U/L), and alanine aminotransferase (ALT) at 25 U/L (reference range: 7–56 U/L). Plain radiographs of the abdomen showed no abnormalities. However, a computed tomography (CT) scan revealed distended loops of the small intestine and a 40-mm calculus within an ileal loop (Fig. 1). The scan also identified air within the gallbladder and adhesions between the thickened gallbladder wall and ileal wall (Fig. 2).

Intravenous fluids and antibiotics were initiated as part of the treatment protocol. However, the patient's condition deteriorated a day after hospital admission. Given the diagnosis of gallstone ileus and the worsening clinical status, an exploratory laparotomy was conducted. Intraoperatively, a broad fistula extending from the gallbladder to the second part of the duodenum was identified, along with severe abdominal adhesions around the gallbladder. Exploration revealed significantly dilated loops of the small bowel proximal to the ileum. An obstruction was located 100 cm from the terminal ileum, leading to an enterotomy, which exposed a sizable gallstone measuring about 4 cm \times 4 cm \times 3 cm (Fig. 3A and B). The stone was carefully repositioned proximally to a non-edematous bowel segment, and a longitudinal incision was made on the antimesenteric edge for its successful extraction. Following the removal of the gallstone, a two-layered suture closure of the enterotomy site was done. He had an uncomplicated postoperative course and was discharged on fifth day after the procedure.

Three months later, he underwent a cholecystectomy with closure of the cholecysto-duodenal fistula. Intraoperatively, a significant fistula was noted between the gallbladder and the second part of the duodenum, which had caused adhesion to surrounding structures. There were no postoperative complications, and he had no abdominal

complaints at the 12-month follow-up.

3. Discussion

The term “gallstone ileus” refers to a mechanical intestinal obstruction caused by the impaction of large gallstones within the GI tract [8]. It often follows initial episode of acute cholecystitis resulting in the formation of a biliary-enteric fistula for the passage of gallstone [4]. In gallstone ileus cases, gallstones typically travel through an internal biliary fistula, with the most common route (75%–83%) being from the gallbladder to the duodenum, as observed in our case. [9]. Approximately 75% of these fistulas are cholecystoduodenal, while only 10%–20% are cholecystocolonic [10]. In rare instances (<1% of all cases), gallstones may travel from the gallbladder through the common bile duct to the papilla of Vater [11]. The impacted gallstones are primarily cholesterol-based, typically around 4 cm in size, which is within the impaction-prone range (≥ 2.5 cm) [9]. Smaller stones, <2 cm in size, are more likely to pass through the gastrointestinal tract and be expelled in stools [12].

The most common location of impaction of gallstone is the terminal ileum in 60.5% of cases because of the small anatomical diameter and less active peristalsis [5]. It is followed by jejunum (16.1%), stomach (14.2%), colon (4.1%), and duodenum (3.5%) [13]. Proximal ileum as involved in our case is relatively an uncommon site for the gallstone impaction.

Abdominal imaging, particularly CT scans, plays a vital role in diagnosing gallstone ileus, offering 93% sensitivity and 100% specificity. Additional diagnostic tools include abdominal ultrasound, Magnetic resonance cholangiopancreatography, and endoscopy [14]. X-ray in our case was normal and diagnosis was established by CT imaging.

Surgery is the established treatment for prolonged ileus or conservative management failure. Preoperative optimization involves GIT decompression, fluid resuscitation, and correction of electrolyte imbalances [14]. The optimal surgical approach remains debatable, and three strategies are described: enterolithotomy, a two-staged approach (initial enterolithotomy followed by delayed cholecystectomy and fistula discontinuation), and a one-stage procedure combining enterolithotomy with cholecystectomy and fistula discontinuation [4,15]. In selected cases, particularly in patients deemed unfit for surgery, endoscopic techniques have been explored as a less invasive alternative. However, these methods have limitations, such as the inability to address larger stones or accompanying fistulas.

Enterolithotomy, either open or laparoscopic, is the preferred choice in high-risk and unstable patients. Open surgery is preferred particularly when there is uncertainty about the diagnosis or when severe adhesions are present. The technique involves creating a longitudinal incision at the antimesenteric edge of the bowel over the point of gallstone impaction, followed by gallstone extraction [10,16].

A two-stage surgical approach is often suggested, with the second surgery performed electively after the patient has recovered from the initial episode [14]. The two-stage procedure is often preferred for elderly patients or those with significant comorbidities due to its lower operative risk, as it minimizes operative risks during the acute phase of illness. There is variability in the recommended interval between operations, ranging from 4 weeks to 6 months [17]. Conversely, one-stage surgery, which combines enterolithotomy with cholecystectomy and fistula closure, eliminates the need for further surgery and reduces complications associated with persistent fistula. This approach is preferred in younger, stable patients with fewer comorbidities. Despite its longer intraoperative time, higher technical demands, potential complications of bile leak, infections, a one-stage procedure may prevent future biliary complications in aforementioned group of patients [14].

In terms of post-operative care, patients undergoing surgery for gallstone ileus often require close monitoring for complications such as infection, bile leaks, and recurrent bowel obstruction. Those who

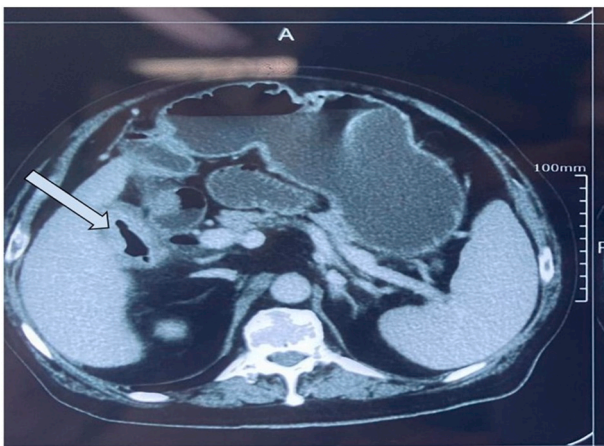


Fig. 1. CT scan (Axial view) of the upper abdomen demonstrating an air in the gallbladder (arrow).

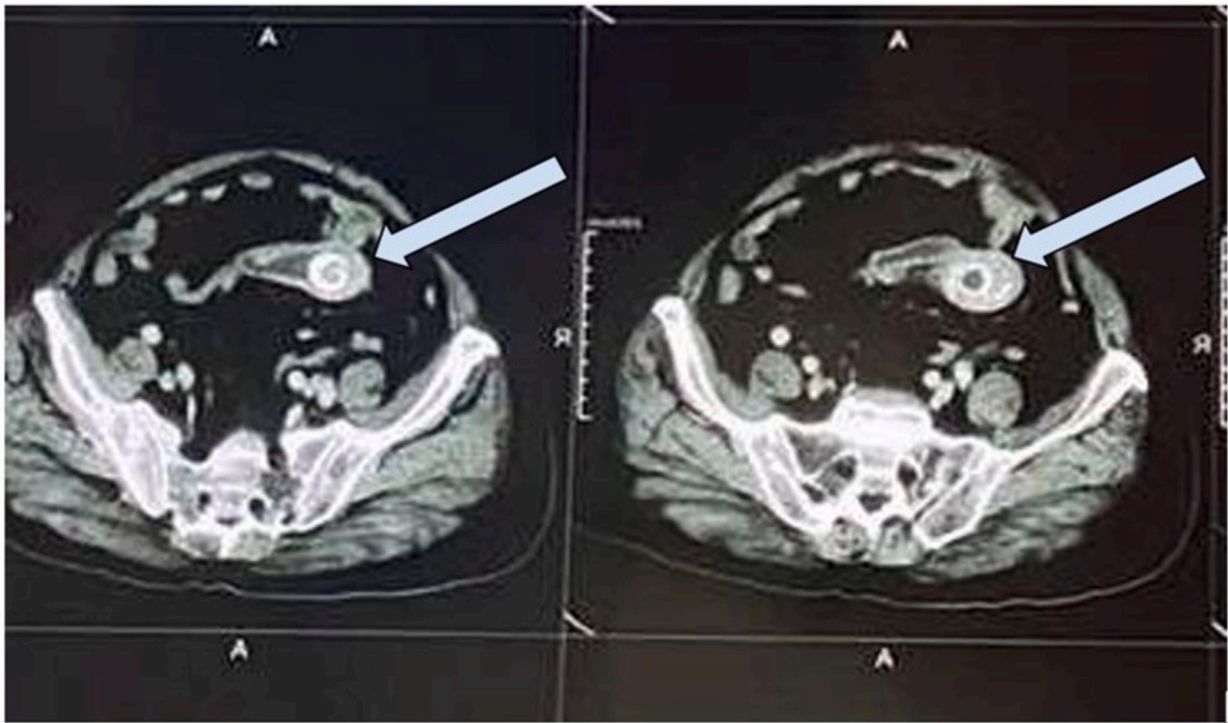


Fig. 2. CT scan showing gallstones of approximately 4 cm in diameter (arrow) within the small bowel.



Fig. 3. A. Impacted stone being removed from the intestine; B: Gallstone measuring 4 cm × 4 cm × 3 cm.

undergo a one-stage procedure are at a higher risk of post-operative complications and may require extended recovery periods [3]. Conversely, patients who undergo a two-stage procedure typically have a less complicated recovery but may need long-term follow-up to monitor for biliary complications, particularly if cholecystectomy is not performed.

4. Conclusion

This case emphasizes the importance of early diagnosis and prompt intervention in gallstone ileus to avoid severe complications. Young surgeons should be aware of the variable clinical presentations and the rationale behind choosing either a one-stage or staged surgical

approach, particularly in managing patients with fistulas or severe adhesions.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Since this is a case report, our Institutional Review Board of Institute of Medicine has waived the requirement for ethical approval.

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Author contribution

S.D., P.L., S.P., and I.T. formulated the original manuscript. S.D., P.L., S.P., I.T., and S.S. reviewed and edited the manuscript. S.D. and A.B. supervised the case. All the authors reviewed and approved the final version of the manuscript.

Guarantor

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Conflict of interest statement

All the authors declare that they have no conflict of interest.

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