

Colonic obstruction due to gallstone sigmoid ileus: Case report

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Abstract

Introduction: Gallstone ileus is a rare complication of gallstone disease, with stone impaction occurring in the large bowel in up to 4% of cases, making gallstone sigmoid ileus an unusual presentation. This condition predominantly affects older patients with significant comorbidities, contributing to its higher morbidity and mortality rates. Given its rarity, the literature lacks recommendations to guide clinical management. Current evidence favors endoscopic treatment as the initial approach, with surgical intervention reserved for emergency situations and after the failure of conservative management.

Case presentation: We report the case of a 96-year-old female patient who presented to the emergency department with abdominal pain and vomiting. Initially, a conservative approach was attempted, but her symptoms persisted. Endoscopic treatment proved unsuccessful, necessitating a minimally invasive and time-efficient surgical approach. This involved a colotomy for gallstone removal followed by a loop sigmoid colostomy. The postoperative period was uneventful, and the patient was discharged on the seventh postoperative day.

Discussion and conclusion: Managing patients with gallstone sigmoid ileus involves unique complexities, influenced by the characteristics of both the patients and the disease. The treatment strategy for this condition should prioritize early stone removal and resolution of large bowel obstruction, employing less invasive methods whenever possible, especially in high-risk patients, to reduce potential morbidity and mortality.

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Keywords: Large-bowel obstruction; Cholelithiasis; Gallstone ileus; Gallstone sigmoid ileus; Endoscopy; Surgery.

Abbreviations: CT: Computed Tomography; ED: Emergency Department; LBO: Large Bowel Obstruction; NOM: Non-Operative Management.

Introduction

Large Bowel Obstruction (LBO) accounts for approximately 25% of all cases of intestinal obstruction [1], with malignancy being its main cause (around 60% of cases) [2]. Gallstone ileus is an infrequent complication of gallstone disease (0.3-0.5%) and a rare etiology of LBO [3-5]. Stone impaction occurs more often in the small-caliber lumen of the small intestine, ileoce-

cal valve, or stomach, and only about 4% of cases occur in the colon [3,4,6]. Gallstone sigmoid ileus can be explained by three main factors: a cholecystoenteric fistula, a wide gallstone able to obstruct a large-caliber lumen and narrowing of the bowel [5]. This condition is related with high morbidity and mortality, as it occurs more frequently in older patients with significant comorbidities, sometimes aggravated by its late presentation

and diagnostic challenge [7]. Given its rarity, there is a lack of recommendations in the literature to direct clinical management. Strategies to relieve obstruction include conservative measures, endoscopic approach, and surgery [5].

We report a case of a 96-year-old female patient who presented to the emergency department complaining of abdominal pain and vomiting. The initial attempt was a conservative approach, but the symptoms persisted. Endoscopic lithotripsy and gallstone removal revealed to be unsuccessful, therefore a surgical intervention was needed.

Case presentation

A 96-year-old female patient, partially dependent in activities of daily living, but with preserved cognition, presented to the Emergency Department (ED) with a two-day history of colicky abdominal pain and vomiting, alongside prostration and decreased urinary output noted on the day of presentation. There was no reported fever, blood in stool, previous similar episodes, or recent weight loss or anorexia. The patient's medical history included hypertension, stroke, peripheral arterial disease, dyslipidemia, chronic constipation (with a bowel movement frequency of once every three days), and hip fracture surgery.

In the ED, her pulse was 120 beats per minute and blood pressure was 88/60 mmHg. She appeared prostrated, with a Glasgow Coma Scale of 14 points (eye opening to speech). On examination, the abdomen was distended, with diffuse tenderness, but without guarding or signs of peritoneal irritation. A digital rectal exam revealed scant liquid feces in the rectal ampulla.

Following intravenous fluid resuscitation, the patient achieved hemodynamic stability.

Laboratory blood tests revealed a hemoglobin level of 14.5 g/dL, a white cell count of $12.0 \times 10^3/\mu\text{L}$, C-Reactive Protein (CRP) level of 1.0 mg/dL, and signs of acute kidney injury with serum creatinine and urea levels of 1.7 and 102 mg/dL, respectively. Additionally, there was evidence of mild hypokalemia, with a serum potassium level of 3.3 mEq/L.

Abdominal and pelvic contrast-enhanced Computed Tomography (CT) showed a large gallstone with a maximum diameter of 3.6 cm located in the rectosigmoid segment, causing partial obstruction at this level (Figure 1); an indistinct gallbladder with an air level in its usual location adjacent to a large bowel loop, raising suspicion of a cholecystocolonic fistula (Figure 2); and no evidence of ascites or pneumoperitoneum.

Given the patient's comorbidities, non-operative measures were initiated, beginning with conservative management including nil per mouth, nasogastric tube insertion, intravenous fluids administration, prokinetics, and enemas. A transient improvement in the patient's clinical condition was observed - pain was well-controlled, kidney function showed slight improvement, hemodynamic stability was maintained, and the patient tolerated a liquid diet. However, bowel movements remained infrequent, with liquid consistency of feces.

A flexible recto-sigmoidoscopy was conducted on the fifth and tenth days of hospitalization, uncovering a large stone measuring at least 5 cm, lodged within the lumen of the sigmoid colon, resulting in partial obstruction, and an ulcerated surrounding mucosa. Despite multiple attempts at endoscopic mechanical lithotripsy and lithotripsy with an electrohydraulic probe, fragmentation of the stone to dimensions suitable for

endoscopic removal proved unsuccessful, as the lumen of the rectosigmoid transition (at 20 cm from the anal margin) had a smaller caliber.

Following the endoscopic findings and a subsequent deterioration in the patient's clinical condition characterized by worsening abdominal pain, kidney injury and electrolyte disturbances, surgical intervention was scheduled.

Given the patient's overall health status and severe comorbidities, a decision was made to utilize locoregional anesthesia in conjunction with sedation. Before skin incision, the inability to manually evacuate the obstruction was confirmed via digital rectal exam. A lower midline laparotomy was then performed. The stone was palpated within the sigmoid colon. The narrower lumen distal to the obstruction, likely due to observed local fibroinflammatory changes and mural thickening, hindered attempts to pass the gallstone distally. Gallstone proximal mobilization (Figure 3), a colotomy for gallstone removal, and loop sigmoid colostomy were subsequently carried out (Figures 4 A-B). The cholecystoenteric fistula was left intact.

The postoperative period proceeded smoothly, with a gradual transition to a normal diet demonstrating oral tolerance and the stoma effectively eliminating feces consistent with Bristol scale type 4-5. Resolution of the kidney injury and the electrolyte disturbances was observed. The patient was discharged on postoperative day 7. Evaluation at postoperative month one revealed an uneventful recovery. Pathology results indicated a brown stone measuring approximately 3 cm in greatest diameter.

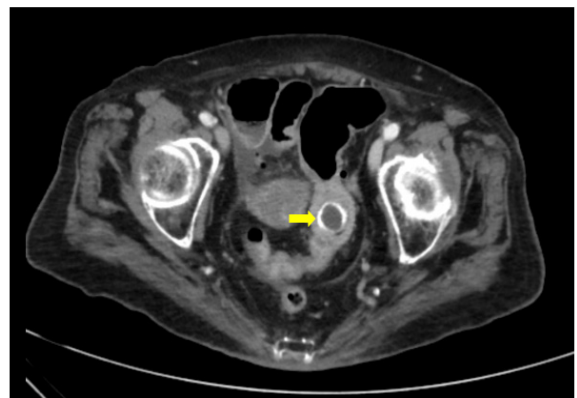


Figure 1: Abdominal and Pelvic CT showing a large gallstone in the rectosigmoid segment (arrow), leading to partial obstruction down to this level. CT: Computed Tomography.

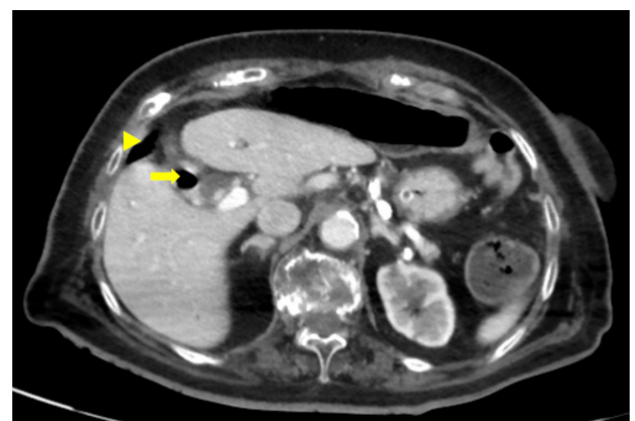


Figure 2: Abdominal and Pelvic CT showing an undefined gallbladder with an air level in its topography (arrow) adjacent to a large bowel loop (arrowhead), raising suspicion for a cholecystocolonic fistula. CT: computed tomography.



Figure 3: Gallstone mobilization to proximal healthy sigmoid colon.

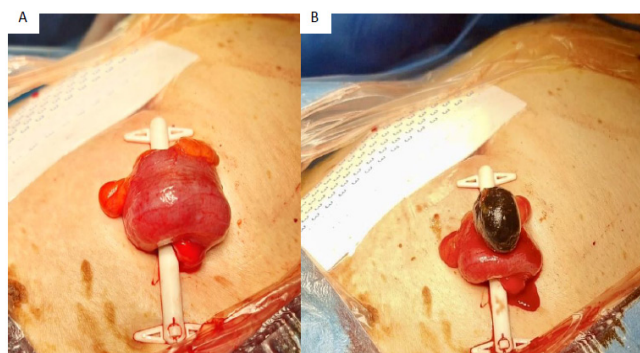


Figure 4: Sigmoid colostomy (A) for gallstone removal during surgery (B).

Discussion

Gallstone ileus is an uncommon complication of gallstone disease, occurring in 0.3-0.5% of cases, and accounts for approximately 1-4% of intestinal obstruction cases [3-5]. This condition generally results from chronic or repeated inflammatory episodes of the gallbladder, leading to the formation of a cholecystoenteric fistula that allows gallstones to migrate [8]. Stone impactions most often occur in the distal ileum and ileo-cecal valve, accounting for 60-85% of cases [3,9]. Gallstone sigmoid ileus, constituting approximately 4% of all gallstone ileus cases, is a rare condition. It may arise from a cholecystocolonic or a cholecystoenteric fistula with the stone passing through the ileocecal valve. Furthermore, the presence of a disease that causes luminal narrowing may increase the likelihood of colonic stone impaction [3].

In a systematic review, Farkas et al. observed a female predominance in gallstone sigmoid ileus cases (30 out of 38 patients) with a mean age of 81.1 years (ranging from 65 to 94 years) [3].

This demographic data aligns with findings from other studies [6,10]. Rodríguez Hermosa et al., analyzing 40 patients with gallstone ileus, also reported a significant female predominance (ratio of 5.5:1) and a mean age of 76 years (range 60-92) [10].

Moreover, these studies revealed that most patients had pre-existing comorbidities such as diverticulosis, cardiovascular disease, hypertension, neoplasia, among others [3,10].

Abdominal pain, vomiting, and constipation have been reported in the literature as the most common presenting symptoms, with the abdominal and pelvic CT scan being the most frequently performed diagnostic modality to confirm diagnosis [3,6]. Farkas et al. observed a mean gallstone size of 4.14 cm (range 2.3-7 cm), while Rodríguez Hermosa et al. reported a size range of 3-5 cm [3,10].

In the study conducted by Farkas et al., Non-Operative Management (NOM) was attempted in 61% of cases. Of these, 74% eventually required surgical intervention, with eight cases necessitating emergency procedures due to bowel ischemia or perforation. Several surgical approaches were employed, with enterolithotomy/modified enterolithotomy, colostomy, and Hartmann's procedure being the most commonly performed [3].

The case presented here involves a 96-year-old female patient with a past medical history of cardiovascular disease, who arrived at the Emergency Department (ED) complaining of abdominal pain and vomiting. An abdominal and pelvic CT scan was conducted, suggesting the possibility of gallstone sigmoid ileus. The greatest diameter of the gallstone was estimated to be 3.6 cm on the CT scan and at least 5 cm during the endoscopic study, aligning with the patterns observed in the aforementioned studies.

Non-Operative Management (NOM) was initially attempted, in line with current literature that enhances endoscopic removal and lithotripsy as the first-line non-operative strategies [3]. However, these approaches were unsuccessful. Although there was no history of diverticulosis, nor was it identified during endoscopy, a narrowed caliber of the sigmoid colon was observed, which hindered the distal mobilization and removal of the stone.

Given the imaging and endoscopic findings, along with the worsening clinical condition of the patient, surgical treatment was deemed necessary. However, due to the patient's overall health status and severe comorbidities, a major surgery was precluded. Instead, a minimally invasive and time-saving approach was chosen, involving a lower midline laparotomy, colostomy for gallstone removal, and loop sigmoid colostomy, and the cholecystoenteric fistula was left intact.

The definitive surgical treatment for gallstone ileus typically involves enterolithotomy, cholecystectomy, and closure of the fistula. This comprehensive approach not only resolves the obstruction but also helps prevent further complications of gallstone disease [7]. However, managing patients with gallstone sigmoid ileus presents unique complexities, influenced by factors such as age, comorbidities, and colonic pathology. Therefore, a management strategy for this condition should prioritize early stone removal and resolution of large bowel obstruction, utilizing less invasive measures whenever feasible. This approach aims to mitigate potential morbidity and mortality, particularly in high-risk patients [3,5].

Conclusion

Gallstone sigmoid ileus is an uncommon complication of gallstone disease and LBO. It predominantly affects older patients who usually have severe comorbidities, leading to challenging management. There is a lack of recommendations to guide the management of gallstone sigmoid ileus regarding conservative or surgical treatment. Current evidence highlights endoscopy and lithotripsy as first-line measures and advises against

conservative management without an endoscopic attempt, as spontaneous evacuation of the stone is rare and delays definitive treatment, along with its consequences. Surgical treatment becomes relevant in cases of NOM failure or in emergency settings. In high-risk patients, a minimally invasive and time-saving approach may be more suitable to mitigate potential morbidity and mortality.

This case report provides the outcome and follow-up of a high-risk 96-year-old patient with NOM failure, leading to minimally invasive surgery.

No conflicts of interest to declare.

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