

## Gallstone ileus: A case report

Immanuel Van Donn Batubara<sup>1\*</sup>, Tomy Lesmana<sup>2</sup>

<sup>1</sup>General Surgery Resident, Department of Surgery, Faculty of Medicine, Airlangga University/RSUD Dr. Soetomo, Surabaya, Indonesia; ivbatubara@gmail.com (I.V.D.B.).

<sup>2</sup>Digestive Surgeon, Department of Digestive Surgery, Faculty of Medicine Airlangga University/RSUD dr. Soetomo, Surabaya, Indonesia.

**Abstract:** Gallstone ileus is a condition where there is a mechanical obstruction of the intestinal lumen caused by gallstones and is a rare complication of cholelithiasis. The prevalence of gallstone ileus is approximately 5% of all patients with intestinal obstruction. We present a female patient with intestinal obstruction caused by gallstone ileus who was treated with laparotomy enterolithotomy for gallstone evacuation. A 64-year-old female patient came to the Emergency Department of Dr. Soetomo Surabaya Hospital with complaints of nausea and vomiting after eating and drinking. The patient reported not being able to defecate for 5 days, followed by an inability to pass gas, with the last instance of flatulence occurring 1 day before entering the hospital. The patient was planned for laparotomy enterolithotomy to evacuate gallstones. The pathophysiology of gallstone ileus involves the obstruction of the intestines due to the impaction of one or more gallstones. This condition is commonly preceded by the initial symptoms of acute cholecystitis. The primary objective in managing gallstone ileus is to alleviate the intestinal obstruction by extracting the gallstone from the intestinal lumen. The author believes that in this case report, enterolithotomy was performed as it has a lower mortality and morbidity rate compared to a single-stage procedure.

**Keywords:** Enterolithotomy, Gallstone ileus.

### 1. Introduction

Gallstone ileus is a rare complication of cholelithiasis, characterized by a mechanical blockage of the intestinal lumen due to gallstones. Typically, gallstones measuring 2–2.5 cm become impacted following an initial episode of acute cholecystitis. The condition can develop through various mechanisms, one of which involves adhesions resulting from gallbladder inflammation. These adhesions may lead to the formation of a fistula, allowing gallstones to enter the intestinal lumen and cause obstruction [1].

Gallstone ileus accounts for approximately 5% of all intestinal obstruction cases. However, its prevalence rises to 25% among patients over 65 years old with non-strangulated intestinal obstruction. Several factors influence the prognosis, some of which are non-modifiable, including female gender, advanced age, immunocompromised status, underlying conditions such as cardiovascular and pulmonary diseases, and delayed diagnosis or treatment [2, 3].

Patients with gallstone ileus typically present with common symptoms, including dehydration, abdominal distension and tenderness, increased bowel sounds, obstructive jaundice, and a history of biliary issues. However, since symptoms vary depending on the location of the gallstone within the intestinal lumen, additional diagnostic investigations are necessary to ensure an accurate assessment. The primary therapeutic objective is to resolve the intestinal obstruction and remove the gallstones. Although there is no universally accepted protocol for managing gallstone ileus, surgical intervention is considered the most effective strategy for enhancing patient outcomes. Three primary surgical approaches are frequently employed: (1) simple enterolithotomy; (2) enterolithotomy combined with

cholecystectomy and fistula closure (one-stage procedure); and (3) enterolithotomy followed by a staged cholecystectomy (two-stage procedure). The selection of the surgical technique is determined by the patient's clinical condition.

In this case report, we present a female patient with intestinal obstruction caused by gallstone ileus. The patient was treated with laparotomy enterolithotomy for gallstone evacuation.

## 2. Case Presentation

A 64-year-old female patient came to the Emergency Department of Dr. Soetomo Surabaya Hospital with complaints of nausea and vomiting after eating and drinking. The patient complained of not being able to defecate since 5 days ago, followed by not being able to fart with the last history of farting 1 day ago before entering the hospital. Prior to the current complaint, there was no history of changes in defecation patterns. The patient has type 2 diabetes mellitus and hypertension that is not controlled with medication.

On physical examination, blood pressure was 152/72 mmHg, with a pulse of 112x/min strong regular lifting. Physical examination of the abdomen found distension with increased bowel noise. No abnormality was found on rectal examination. From the blood laboratory examination, there was an increase in BUN 36 mg/dL, CRP 17.4 mg/L, amylase 139 u/L, lipase 75 u/L, random blood glucose 215 mg/dL and decreased chloride level 95 mmol/L. Protein (+2) and urobilinogen (+1) were found in the urine sample.

A plain chest examination was performed on March 10, 2022 with the results of cardiomegaly with aortosclerosis and no lung abnormalities. BOF/LLD examination on the same day, with BOF showing a coiled spring and herring bone appearance with dilated small bowel shadow mixed with fecal material with visible distribution to the pelvic cavum, which supports the picture of intestinal obstruction. There is also a round-shaped radioopaque shadow that forms an onion ring image, measuring  $\pm 2.4 \times 2.3$  cm in the pelvic cavum, which can be a differential diagnosis of buli stones or fecalitis. The LLD examination also found a pathological step ladder image and no free air outside the bowel contour. An abdominal ultrasound was performed 1 day later, and there were no abnormalities in the hepatic, splenic, gallbladder, pancreas, right and left kidneys, buli, uterus and adnexa.



**Figure 1.**  
Plain abdominal photograph (BOF) showing coiled spring, herring bone appearance, and round.

From the results of history, physical examination and support, the patient was diagnosed with total intestinal obstruction due to suspected gallstone ileus. The patient was treated initially with 1000 cc lactated Ringer's rehydration for one hour, then continued with 1500ml lactated Ringer's fluid/24 hours, intravenous injection of Antrain 1 ampoule/8 hours, Levofloxacin 750 mg/24 hours, and Metronidazole 500 mg/8 hours. The patient was planned for enterolithotomy laparotomy to evacuate gallstones.

The patient was operated under general anesthesia using endotracheal intubation, positioned supine, and disinfection of the operating field using Povidone Iodine 10% was narrowed with sterile doek. A skin incision and midline opening of the operating field were then performed. On exploratory laparotomy, a clear peritoneum was found with small bowel dilatation from jejunum to ileum with a distance of 120 cm proximal to the ileocaecal junction. An intralumen stone was found in the ileum, black in color with a diameter of  $\pm$  3cm which was 120 cm proximal to the ileocaecal junction, as well as

a great adhesion of the omentum to the gallbladder. Enterolithotomy and primary suture were performed. However, gallbladder evaluation and fistulation could not be performed. Subsequently, the abdominal cavum was washed and an abdominal drain was placed with a 32fr rectal tube, then sutured layer by layer.

Postoperatively, the patient was treated with Clinimix 15e infusion 1000cc/24 hours, and injection of Levofloxacin 1x750mg, Metronidazole 3x500 mg, Metoclopramid 3x10 mg, Metamizole 3x1 gram. Complete blood laboratory tests, serum electrolytes and albumin were performed postoperatively, and surgical tissue in the form of stones was sent to the clinical pathology unit



**Figure 2.**  
Durante operation; black intralumen ileal stone, diameter  $\pm$  3cm.



**Figure 3.**  
Black stone specimen, +/- 3 cm in diameter.

### 3. Discussion

Gallstone ileus is a form of mechanical obstruction caused by gallstones becoming lodged in the gastrointestinal tract [1]. It is a rare complication of cholelithiasis. Despite its name, "ileus" is somewhat misleading, as the condition results from a physical blockage rather than paralytic ileus [2].

Intestinal obstruction is a syndrome characterized by the blockage of intestinal contents, including gases and fluids, within the small or large intestine. This obstruction can be either partial or complete. The causes of intestinal obstruction are classified into intraluminal, intestinal wall, and extrinsic factors. Intraluminal causes are relatively rare and include conditions such as gallstone ileus, where a gallstone enters through an enterobiliary fistula, as well as obstruction due to parasite accumulation, food bolus, or barium impaction following a barium enema examination. Obstructions originating in the intestinal wall can result from conditions like small or large bowel neoplasms, congenital atresia, stenosis due to inflammatory bowel disease, and strictures following surgery or trauma. Extrinsic causes involve external compression from pathological conditions such as masses, adhesions, strangulated internal or external hernias, volvulus, and intussusception. Intestinal obstruction is broadly classified into mechanical and paralytic types. Mechanical obstruction arises from intraluminal, intestinal wall, or extrinsic factors, whereas paralytic obstruction results from reduced or absent intestinal peristalsis. Common causes of paralytic obstruction include peritonitis, infections, abdominal or pelvic surgery, certain medications (e.g., antidepressants and painkillers), neuromuscular disorders, and peritoneal hemorrhage [4].

Supportive management for intestinal obstruction should be started as soon as possible with intravenous crystalloid administration, anti-emesis and the patient fed. Dextrose-saline crystalloids and balanced isotonic crystalloid replacement fluids appropriate to the patient's fluid loss are recommended. Nasogastric tube insertion can be used to analyze gastric content (cloudy gastric aspiration products are characteristic of distal small bowel or colonic obstruction). A urine catheter is also placed to monitor urine production [5].



Gallstone ileus occurs in approximately 0.3–0.5% of patients with cholelithiasis and accounts for less than 5% of all intestinal obstruction cases. However, its prevalence rises to 25% in cases of non-strangulated small bowel obstruction in patients over 65 years old. Some studies estimate that gallstone ileus contributes to 1–4% of all intestinal obstruction cases [2, 3, 6]. The condition has a high mortality rate, ranging from 12% to 27%, largely due to factors that are difficult to modify, such as advanced age, multiple comorbidities (particularly cardiovascular, pulmonary, and endocrine diseases), and delays in seeking medical attention (typically 4–8 days from symptom onset) or in receiving a diagnosis. The average age of presentation is 74 years, and it is significantly more common in women than men, with a ratio of 1:3 to 1:7. Most affected patients are elderly with multiple underlying health conditions. Recurrence of gallstone ileus occurs in 5% of cases, with 85% of recurrences happening within the first six months following surgical intervention [3].

The pathophysiology of gallstone ileus involves the impaction of one or more gallstones within the gastrointestinal tract, leading to mechanical obstruction. In most cases, gallstones must exceed 2–2.5 cm in diameter to induce obstruction; however, in some instances, multiple smaller stones may coalesce to form an obstructive mass [3]. Gallstone ileus is often preceded by an episode of acute cholecystitis. Inflammatory processes affecting the gallbladder and adjacent structures contribute to adhesion formation, ultimately resulting in the development of a fistula between the gallbladder and the gastrointestinal tract. Given their close anatomical relationship, fistulization most commonly occurs between the gallbladder and the duodenum, although involvement of the stomach, small intestine, and transverse colon has also been documented [1].

The displacement or spillage of gallstones during laparoscopic cholecystectomy is a recognized occurrence. Retained gallstones within the abdominal cavity have the potential to induce complications such as intra-abdominal abscess formation and bowel wall ulceration. These pathological changes may facilitate the migration of gallstones into the intestinal lumen, ultimately resulting in gallstone ileus [7–9].

Upon entering the lumen of the duodenum, stomach, or intestine, gallstones typically migrate distally until they lead to obstruction. Impaction can occur at various sites within the gastrointestinal tract, with the ileum being the most frequently affected location (60.5%), followed by the jejunum (16.1%), stomach (14.2%), colon (4.1%), and duodenum (3.5%). The highest incidence of impaction is observed in the terminal ileum and ileocecal valve, primarily due to the narrower lumen and diminished peristaltic activity. These distribution patterns correspond with the locations of fistula formation between the gallbladder and different segments of the gastrointestinal tract. Additionally, conditions such as diverticula, neoplasms, and intestinal strictures—including those associated with Crohn's disease—can further reduce luminal diameter, increasing the probability of gallstone impaction in these regions [10, 11].

The clinical manifestation of gallstone ileus is often preceded by a history of biliary symptoms, reported in approximately 27–80% of cases. Gallstone ileus may present in acute, intermittent, or chronic forms of gastrointestinal obstruction. Common clinical features include nausea, vomiting, and abdominal pain. The episodic nature of pain and vomiting, along with changes in vomitus coloration and opacity, is attributed to the progressive distal migration of the gallstone within the gastrointestinal tract. The composition and appearance of vomitus are influenced by the anatomical location of the obstruction. When the gallstone is located in the stomach or proximal intestine, the vomitus primarily contains gastric contents. However, as the obstruction progresses to the ileum, the vomitus becomes darker and cloudier in appearance [1].

The primary objective of managing gallstone ileus is to alleviate intestinal obstruction through the extraction of the gallstone from the intestinal lumen. Patients often experience fluid and electrolyte imbalances, as well as general metabolic disturbances and comorbid conditions, which must be addressed and stabilized prior to undergoing surgical intervention [12, 13]. The primary management of gallstone ileus is surgical, but it remains controversial to date, with no consensus on the recommended primary procedure. The main controversy regarding surgical management revolves

around the scope and timing of the surgical procedure. Gallstone ileus involves three main components, namely cholelithiasis, biliary-enteric fistula and intestinal obstruction. Intestinal obstruction is generally treated with laparotomy enterostomy with stone extraction (enterolithotomy). The other two factors can be cholecystectomy and fistula closure. A long-standing controversy is whether the biliary surgical procedure should be performed at the same time as the intestinal obstruction release (one-stage procedure), or performed in stages (two-stage procedure), or not at all. Therefore, there are three main procedures for the management of gallstone ileus: (1) simple enterolithotomy; (2) enterolithotomy, cholecystectomy and fistula closure (one-stage procedure); and (3) enterolithotomy with cholecystectomy and staged fistula closure (two-stage procedure) [12-14].

The majority of patients with gallstone ileus have been initially managed through enterolithotomy via laparotomy. During exploratory laparotomy, the site of obstruction is identified. A longitudinal incision is made along the antimesenteric border, proximal to the impacted stone. An enterotomy is then performed at the site of the stone, followed by stone extraction. Careful closure of the enterotomy is essential to prevent bowel lumen narrowing, with transverse closure being preferred. In certain cases, bowel resection may be required following enterolithotomy. Procedures involving in situ stone crushing should be avoided, as they may cause damage to the bowel wall. If multiple stones are present, they can be removed through a single incision by mobilizing the smaller stones towards the larger ones after cleansing the bowel. In cases of sigmoid obstruction, sigmoid resection to excise both the stones and the underlying stenosis is advised [12-16].

Cholecystoenteric fistula in the presence of a patent cystic duct may close spontaneously, as long as the distal obstruction is managed, stones are removed and complications associated with persistent fistula are treated.<sup>12,15</sup> It was found during reoperation that, in the absence of persistent cholelithiasis, the enterobiliary fistula would close spontaneously. Fistula search is also not easy to perform intra-operatively, which will result in an increase in the length of surgery and the possibility of intra-operative complications. However, the incidence of recurrent cholecystitis is significant, as it may occur in conjunction with an increased risk of gallbladder carcinoma in patients with unresolved fistulas [12, 13].

A review series reporting on recurrence showed the risk of gallstone ileus recurrence in patients was about 8.2% in patients who only underwent enterolithotomy; 52% of recurrences occurred in the first month, with the remainder occurring within 2 years postoperatively, with a mortality rate of 12-20% [13, 14]. Another study also found a mortality rate of 16.9% in patients who underwent a one-stage procedure, and 11.7% in patients who underwent only enterolithotomy. However, the difference did not reach statistical significance ( $P < 0.17$ ).<sup>13,14</sup> Of note from other studies is that recurrence of gallstone ileus only occurred in 6% of patients after enterolithotomy, and 5% in patients after a single-stage procedure [12, 17].

A study conducted in Croatia reported a morbidity rate of approximately 27.3% for patients undergoing enterolithotomy alone, compared to 61.1% for those undergoing the one-stage procedure. The associated mortality rates were 9% for enterolithotomy and 10.5% for the one-stage procedure. The authors concluded that enterolithotomy should be considered the preferred treatment, while the one-stage procedure may be suitable for patients with conditions such as acute cholecystitis, gallbladder gangrene, or residual gallstones. However, the study lacked randomization, and the methodology for selecting the surgical approach was not specified, which may have introduced selection bias in the patient grouping [12].

The choice of surgical procedure should be determined by the patient's clinical status. In situations where the patient is critically unstable, has multiple comorbidities, and where dissection presents a significant risk, enterolithotomy is the preferred option, especially when biliary dissection is contraindicated during the initial surgery [13, 15].

Cholecystectomy with fistula closure may be considered on an elective basis, particularly in patients exhibiting biliary symptoms or residual cholelithiasis detected through ultrasonography. The advantages of a one-stage procedure that incorporates cholecystectomy include a reduced risk of

recurrent gallstone ileus, prevention of malabsorption and weight loss linked to a persistent fistula, and the potential to prevent cholecystitis, cholangitis, and gallbladder carcinoma. However, this approach is associated with higher morbidity and mortality rates [15].

Based on a study conducted by Halabi, et al. [8] it was found that performing a one-stage procedure increased the length of hospitalization and mortality significantly because in patients with intestinal obstruction, one-stage procedures are highly invasive, and postoperative complications are common. Two-stage surgery is an enterolithotomy first with cholecystectomy and fistula closure performed at a later date when the patient has stabilized and passed the acute episode. This procedure is usually performed in acute patients with severe comorbidities because it has a shorter operating time, and has a lower mortality rate of about 11.7% compared to the one-stage procedure which is about 16.9%. There is no consensus on the interval between enterolithotomy and cholecystectomy and fistula closure, but it can be done around 4 weeks to 6 months after the first surgery. However, the two-stage procedure has the disadvantages of higher recurrence risk, risk of retrograde cholecystitis, and higher risk of cancer due to the remaining cholecystointestinal fistula [17, 18].

#### 4. Conclusion

From the above cases, it can be concluded that intestinal obstruction due to gallstone ileus is a case that is not often found, but has a treatment and complications that are not easy, where there is no consensus on the definitive therapy that needs to be done. Post-surgical morbidity and mortality rates are also highly variable and depend on the patient's clinical condition and comorbidities. The author believes that in this case report, enterolithotomy was performed as it has a lower mortality and morbidity rate compared to a single-stage procedure.

#### Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

#### Acknowledgements:

The author would like to express gratitude to Tomy Lesmana, dr. Sp.B, Subsp.BD (K), as the supervising professors for this report. The author also extends thanks to the Director of Dr. Soetomo General Hospital, Surabaya, for providing the opportunity to conduct this study at Dr. Soetomo General Hospital, Surabaya.

#### Copyright:

© 2025 by the authors. This open-access article is distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

#### References

- [1] C. M. Nuño-Guzmán, M. E. Marín-Contreras, M. Figueroa-Sánchez, and J. L. Corona, "Gallstone ileus, clinical presentation, diagnostic and treatment approach," *World Journal of Gastrointestinal Surgery*, vol. 8, no. 1, pp. 65-76, 2016. <https://doi.org/10.4240/wjgs.v8.i1.65>
- [2] L. Chang, M. Chang, H. M. Chang, A. I. Chang, and F. Chang, "Clinical and radiological diagnosis of gallstone ileus: A mini review," *Emergency Radiology*, vol. 25, pp. 189-196, 2018.
- [3] X.-Z. Dai, G.-Q. Li, F. Zhang, X.-H. Wang, and C.-Y. Zhang, "Gallstone ileus: Case report and literature review," *World Journal of Gastroenterology*, vol. 19, no. 33, pp. 5586-5589, 2013. <https://doi.org/10.3748/wjg.v19.i33.5586>
- [4] V. Neri, 'Management of intestinal obstruction', in D. V. Garbuzenko (ed.), *actual problems of emergency abdominal surgery*. London: IntechOpen. <https://doi.org/10.5772/63156>, 2016.
- [5] F. Catena, B. De Simone, F. Coccolini, S. Di Saverio, M. Sartelli, and L. Ansaloni, "Bowel obstruction: A narrative review for all physicians," *World Journal of Emergency Surgery*, vol. 14, no. 1, p. 20, 2019. <https://doi.org/10.1186/s13017-019-0242-0>



- [6] M. Jakubauskas, R. Luksaitė, A. Sileikis, K. Strupas, and T. Poskus, "Gallstone ileus: Management and clinical outcomes," *Medicina*, vol. 55, no. 9, p. 598, 2019. <https://doi.org/10.3390/medicina55090598>
- [7] S. L. Deckoff, "Gallstone ileus: A report of 12 cases," *Annals of Surgery*, vol. 142, no. 1, pp. 52–65, 1955. <https://doi.org/10.1097/0000658-195507000-00007>
- [8] W. J. Halabi *et al.*, "Surgery for gallstone ileus: A nationwide comparison of trends and outcomes," *Annals of Surgery*, vol. 259, no. 2, pp. 329–335, 2014. <https://doi.org/10.1097/SLA.0b013e31827eefed>
- [9] M. Luu and D. Deziel, "Unusual complications of gallstones," *Surgical Clinics of North America*, vol. 94, no. 2, pp. 377–394, 2014. <https://doi.org/10.1016/j.suc.2013.12.004>
- [10] A. R. Dias and R. I. Lopes, "Biliary stone causing afferent loop syndrome and pancreatitis," *World Journal of Gastroenterology: WJG*, vol. 12, no. 38, p. 6229, 2006.
- [11] G. Micheletto, P. Danelli, A. Morandi, V. Panizzo, and M. Montorsi, "Gallstone ileus after biliointestinal bypass: Report of two cases," *Journal of Gastrointestinal Surgery*, vol. 17, no. 12, pp. 2162–2165, 2013. <https://doi.org/10.1007/s11605-013-2272-2>
- [12] R. Ravikumar and J. G. Williams, "The operative management of gallstone ileus," *The Annals of The Royal College of Surgeons of England*, vol. 92, no. 4, pp. 279–281, 2010. <https://doi.org/10.1308/003588410X12699663990771>
- [13] C. M. Nuño-Guzmán, J. Arróniz-Jáuregui, P. A. Moreno-Pérez, É. A. Chávez-Solís, N. Esparza-Arias, and C. I. Hernández-González, "Gallstone ileus: One-stage surgery in a patient with intermittent obstruction," *World journal of gastrointestinal surgery*, vol. 2, no. 5, p. 172, 2010. <https://doi.org/10.4240/wjgs.v2.i5.172>
- [14] M. Doogue, C. Choong, and F. Frizelle, "Recurrent gallstone ileus: Underestimated," *The Australian and New Zealand journal of surgery*, vol. 68, no. 11, pp. 755–756, 1998. <https://doi.org/10.1111/j.1445-2197.1998.tb01756.x>
- [15] A. Requena-López, B. Mata-Samperio, F. Solís-Almanza, R. Casillas-Vargas, and L. Cuadra-Reyes, "Comparison of surgical techniques in biliary ileus and their results," *Surgery and Surgeons*, vol. 88, no. 3, pp. 307–314, 2020. <https://doi.org/10.24875/CIRU.20000047>
- [16] M. I. Salazar-Jiménez, J. Alvarado-Durán, M. R. Fermín-Contreras, F. Rivero-Yáñez, A. I. Lupian-Angulo, and A. Herrera-González, "Gallstone ileus, surgical management review," *Surgery and Surgeons*, vol. 86, no. 2, pp. 182–186, 2018.
- [17] R. M. Reisner and J. R. Cohen, "Gallstone ileus: A review of 1001 reported cases," *The American Surgeon*, vol. 60, no. 6, pp. 441–446, 1994.
- [18] E. Habib and A. Elhadad, "Digestive complications of gallstones lost during laparoscopic cholecystectomy," *HPB*, vol. 5, no. 2, pp. 118–122, 2003.