



## Gallstone Ileus: A Case Report

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### Abstract

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**BACKGROUND:** Gallstone ileus (GI) is a mechanical obstruction in the intestinal lumen due to gallstones. Its prevalence is very low, but it possesses a high mortality rate. It is commonly found in older female population.

**CASE REPORT:** We reported a case of GI in a 61-year-old Chinese female, who presented with acute onset of abdominal pain, nausea, and intermittent vomiting. On water-soluble contrast follow-through examination, she showed total bowel obstruction on the level of terminal ileum due to suspected gallstone. Exploratory laparotomy with procedure of enterolithotomy and stone removal by milking the bowel distal to the stone were performed. Post-operative course was uneventful, but the patient was discharged at post-operative day 8. Furthermore, the patient underwent cholecystectomy and fistula repair in the following days (two-stage surgery). She was followed up in the clinic for 12 months and the patient remained asymptomatic.

**CONCLUSION:** GI is a rare medical condition with a high mortality rate, commonly affecting females and elder population. It must be considered in a patient with bowel obstruction, especially with a history of cholelithiasis. Many clinicians prefer enterolithotomy alone, followed by cholecystectomy at later date, because of its lower morbidity and report high spontaneous fistula closure.

## Introduction

Gallstone ileus (GI) is a mechanical obstruction in the intestinal lumen due to single or multiple gallstones.<sup>[1,2]</sup> A gallstone may enter the intestinal tract through a fistula connecting gallbladder and duodenum. There are several types of the fistula with cholecystoduodenal fistula being the most common (75%), followed by cholecystocolic fistula (10–20%) and other types (15%).<sup>[3]</sup> Its prevalence rate ranges between 1% and 4% from all bowel obstruction cases. Less than 25% of non-strangulated small-bowel obstruction in older patients (>65 years) are caused by GI. Females suffer GI more often compared to males with a ratio of 3.6–6:1.<sup>[4,5]</sup> Among all of cholelithiasis patients, GI is only observed in 0.3%–0.5% of the population.<sup>[2,6]</sup> The obstruction usually occurs at the level of the ileocecal valve.<sup>[7]</sup> Despite its low prevalence rate, GI possesses a high mortality rate. Approximately 12–27% of all cases are deceased mostly due to misdiagnosis and delayed diagnosis. Other contributing factors toward poorer outcome are age, the presence of aggravating medical conditions, and diagnosis difficulty.<sup>[4,8]</sup> In this case report, we describe a case of a 61-year-old female with GI.

## Case Report

A 61-year-old Chinese female presented with acute onset of abdominal pain, nausea, and intermittent vomiting for 3 days. She complained more than 5 episodes of bilious vomiting a day. Flatulence and defecation were absent since then. Her abdomen was distended. She had medical history of hypertension, dyslipidemia, and hyperuricemia. She had taken bisoprolol, amlodipine, atorvastatin, and allopurinol for the past 8 years. Her past surgical history included nasal polypectomy, hysterectomy due to uterine leiomyoma, and large intestinal polypectomy. On physical examination, the abdomen was mildly distended, tympanic on percussion, and increased bowel movement with audible metallic sound. Digital rectal examination was normal. Blood test showed normal complete blood count, electrolyte, amylase and lipase, and unremarkable liver function test. Plain X-ray revealed cholelithiasis and mechanical small bowel obstruction possibly due to mobile gallbladder stone obstruction in small intestine (ileum projection) (Figure 1). Abdominal ultrasound showed collapsed gallbladder, cholelithiasis, small bowel obstruction, and mild fatty liver (Figure 2). She underwent abdominal decompression and treated with intravenous fluids and antibiotics. In the 2<sup>nd</sup> and

3<sup>rd</sup> days of admission, she underwent water-soluble contrast follow-through examination which showed total small bowel obstruction at the level of terminal ileum due to a mass with a diameter of 2.6 cm, which suspected as gallstone (Figure 3). Diagnosis of GI was then made and laparotomy procedure was done. Abdominal computed tomography (CT) scan was not performed in this patient because of the limited cost of the patient and she was not covered by health insurance. Exploratory laparotomy with procedure of enterolithotomy and stone removal by milking the bowel distal to the stone were performed (Figure 4). She had uneventful post-operative condition and was discharged on post-operative day 8. Furthermore, the patient underwent cholecystectomy and fistula repair in the following days. She was followed up in the clinic for 12 months and the patient remained asymptomatic. The patient had given informed consent to publication.

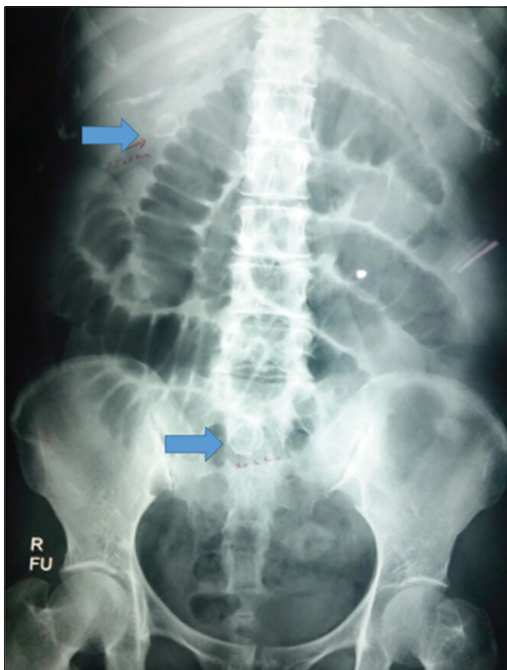


Figure 1: Plain abdominal radiograph showed gallbladder stone and mechanical small bowel obstruction possibly due to mobile gallbladder stone obstructed in small intestine (ileum projection)

## Discussion

GI is a mechanical bowel obstruction due to impaction of gallstones in the lumen of bowel. Stones with a diameter of <2.5 cm usually pass through the lumen spontaneously. For this situation, conservative treatment with decompression by nasogastric drainage is conducted before a decision to remove the impacted stone surgically is made. Gallstones with a diameter of  $\geq 2.5$  cm can cause obstruction.<sup>[9,10]</sup> Literature reported a range of diameter of obstructing stone as 2–5 cm. Multiple stone obstruction is observed in 3–40% of cases.<sup>[11]</sup>



Figure 2: Ultrasound of gallbladder showed collapsed gallbladder and cholelithiasis



Figure 3: Water-soluble contrast follow-through examination showed total obstruction of ileum, most likely caused by mobile gallbladder stone

An episode of acute cholecystitis often precedes GI. The inflammation causes adhesion formation and erosion on the gallbladder wall due to the pressure effect of gallstone. This process leads to fistula formation between the gallbladder and the gastrointestinal tract. The gallstone may enter the gastrointestinal tract through that fistula and can impact anywhere, such as the ileum (60.5%), jejunum (16.1%), stomach (14.2%), colon (4.1%), and duodenum (3.5%). It can also pass through the gastrointestinal tract spontaneously (1.3%). The



Figure 4: Impacted gallstone from terminal ileum measuring 2.6 cm in diameter

most common impaction sites are the terminal ileum and ileocecal valve due to their narrow lumen and potentially less bowel movement. Rarely, gallstone may enter the duodenum through the common bile duct and the dilated ampulla of Vater.<sup>[12]</sup> In this patient, the gallstone was 2.6 cm in diameter and impacted in the terminal ileum.

GI is more common in female compared to male with a ratio of 3.5:1<sup>[1]</sup> and in elder population (60–84 years).<sup>[12]</sup> In this case, the patient was a 61-year-old female. Clinical manifestations are usually non-specific. Patients often come with obstructive symptoms such as intermittent nausea, vomiting, abdominal distension, and pain.<sup>[13,14]</sup> Classically, this disorder is marked by episodic subacute obstruction known as “tumbling obstruction,” which resulted from the stone tumbling through the gastrointestinal lumen. On the other hand, transient gallstone impaction causes diffuse abdominal pain and vomiting. The symptoms are intermittent as the stone lodges in a more distal lumen, mainly the terminal ileum or ileocecal valve.<sup>[2]</sup> If GI occurs in elderly patients with medical comorbidities, intermittent symptoms may delay the diagnosis. Diagnosis is usually made from the 3<sup>rd</sup> to 8<sup>th</sup> day after the onset of symptoms, reflecting the intermittent gallstone movement until impaction occurs.<sup>[12]</sup> In this case, the patient came to the hospital on the 3<sup>rd</sup> day of bowel obstruction symptom without history of cholelithiasis before.

Leo George Rigler in 1941 described classical findings on plain abdominal radiography for gallstone-induced bowel obstruction.<sup>[2]</sup> It included pneumobilia or contrast material in the biliary system, partial or total intestinal obstruction, ectopic gallstone, and changing gallstone position on serial examinations. The presence of two of the three first signs was considered pathognomonic and has been found in 20%–50% of cases.<sup>[2,12]</sup> In this case, plain radiograph showed dilated intestinal with visualized stone in projection of ileum and gallbladder.

Gastrointestinal barium examination can identify the location of obstruction or fistula. Ultrasound can also be used to confirm preoperative diagnosis such as cholelithiasis. In addition, fistulas may be detected.<sup>[11,15]</sup> In this case, gallstone was visualized in the gallbladder and small intestine. Abdominal CT is the best modality to diagnose GI. Its sensitivity and specificity are 93% and 100%, respectively. Abdominal CT also offers valuable information for a decision-making strategy and surgical planning.<sup>[1]</sup> In this case, the diagnosis of GI was made based on water soluble contrast follow-through study where it showed small bowel obstruction and ectopic gallstone. Abdominal CT was not conducted due to the limited cost of the patient and she was not covered by health insurance.

Therapeutic goal for patient with GI is to relieve the intestinal obstruction by extraction of the impacted gallstone. Available options are as follows: (i) Enterolithotomy alone, (ii) two-stage surgery (enterolithotomy followed by cholecystectomy), and (iii) one-stage surgery (enterolithotomy, cholecystectomy, and fistula repair).<sup>[15]</sup> Bowel resection is necessary if perforation occurs.<sup>[1]</sup> Factors influencing therapeutic option are age, medical comorbidities, and duration of bowel obstruction. It is associated with post-operative complications.<sup>[12]</sup> Fistula closure is associated with a higher prevalence of mortality if conducted hastily.<sup>[1]</sup>

The patient did not undergo one-stage surgery because this procedure showed higher mortality rate with a higher level of invasiveness.<sup>[15]</sup> We elected to perform an enterolithotomy and then continued with cholecystectomy at a later date (two-stage surgery). However, two-stage surgery has risk due to persistence of cholecystointestinal fistula such as retrograde cholecystitis or gallbladder cancer. A previous study found that fistula closure without treatment of the biliary tracts occurred in 61.5% of cases.<sup>[16,17]</sup> Recurrent GI due to residual gallstone reached 8.2% so it requires continuous follow-up.<sup>[18]</sup> The patient was followed up in the clinic for 12 months and the patient remained asymptomatic.

## Conclusion

GI is a rare medical condition with a high mortality rate, commonly affecting females and elder population. It must be considered in a patient with bowel obstruction, especially with a history of cholelithiasis. Patients often come with unspecific and intermittent symptoms which may delay the diagnosis. Abdominal CT is usually preferred as a diagnostic modality. Many clinicians prefer enterolithotomy alone, followed by cholecystectomy at later date, because of its lower morbidity and report high spontaneous fistula closure.

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