Journal of Surgery and Surgical Specialities
Volume 1, Issue 1, March 2025; pp: 13-18
eISSN: 2455-2860 DOI: 10.65129/surgical.v1i1.8

CASE REPORT

Gallstone Ileus - A Rare Cause of Acute Small Bowel Obstruction in an Elderly Female, a Clinical Case Report

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Abstract

Gallstone ileus is a rare condition occurring in around 0.3 to 0.5 % of patients with cholecystitis. It contributes to less than 1% causes for intestinal obstruction. It occurs in a long-standing case of cholelithiasis due to the formation of a bilio-enteric fistula. It is usually impacted in the terminal ileum, where it produces acute intestinal obstruction, characterised by Rigler's triad. In certain special situations, gallstone may get impacted in duodenum to give rise to the Bouveret Syndrome. Treatment entails mainly emergency treatment for relieving small bowel obstruction. While the definitive management of bilio-enteric fistula is undertaken at a later date once the general conditions of the patient have been improved and appropriate imaging studies are done to localise the site of bilio-enteric fistula.

Keywords: Bilio-Enteric Fistula, Bouveret Syndrome, Gallstone Ileus, Intestinal Obstruction, Rigler's Triad

1. Introduction

Gallstone ileus is a rare complication of gallstone disease, as a result of impaction of one or more gallstones inside the lumen of the narrowest parts of Gastro-intestinal tract. It is most commonly seen in elderly and in women. Recurrent attacks of Calculous Cholecystitis leads to adhesions between Gall Bladder and adjacent bowel (most commonly in the first part of Duodenum 'D1'). As there is a huge calculi, it may compress the GB against Duodenum and causes pressure effects and fistulises into the Duodenum resulting in a Cholecysto-enteric fistula, which is wide enough to permit passage of a large GB calculus. This calculi then gets impacted at the narrowest portion of Small Bowel, causing Mechanical intraluminal small bowel obstruction. Majority of the smaller gallstones may pass through the intestinal lumen asymptomatically. Only the gallstones that are more than 2 to 5 cm are impacted in the small intestine just before its termination in the ileo-caecal valve. There is often a delay in presentation because of the so called 'tumbling phenomenon'. The degree of symptom depends on the level of impaction. And hence there is a long clinical course which is most of the times, indolent. Stones less than 2 cm may pass without causing any obstruction and hence are less symptomatic. Bouveret Syndrome is a rare form of Gallstone ileus that causes gastric outlet obstruction due to a 'cholecysto-duodenal fistula'. Patient presents with feature of gastric outlet obstruction like vomiting and CT may reveal the finding. Rigler's triad is the Classical Radiographic sign seen in Gallstone ileus, which has pneumobilia, small bowel obstruction and a calcified mass in the right iliac fossa (representing the impacted gallstone). In a patient presenting with ileus or small bowel obstruction, if the general condition of the patient is poor or if there are dense adhesions between the gall bladder and the duodenum and if the cholecysto-enteric fistula cannot be identified, there must not be any attempt made to dissect further

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Article Received on: 20 Jan 2025 Revised on: 15 Feb 2025 Accepted on: 5 March 2025

and remove the fistula as it may cause injury to the Common Bile Duct or the Common Hepatic Duct. The Small Bowel obstruction is relieved by an enterotomy proximal to the obstruction, and the stone is milked out via the enterotomy. Enterotomy will be closed and thorough peritoneal lavage is given after which abdomen will be closed in layers with an abdominal drain. Later, once the general condition of the patient improves, a CECT or an MRCP will be obtained, and the site of cholecysto-enteric fistula is determined and definitive surgery is planned later.

2. Aim and Objectives

To report a rare case of gallstone ileus in a 70 years old female and its surgical management.

3. Review of Literature

Similar case reports from various journals were collected and reviewed for the management of gallstone ileus. Gallstone ileus is one of the rare complications of cholelithiasis. It often occurs following an episode of acute cholecystitis[1]. The first case of gallstone ileus was observed and described by Thomas Bartholin in a patient during autopsy in 1654. Gallstone develops in 0.3% 0.5% of patients with cholelithiasis. It accounts for less than 0.1% of all mechanical small bowel obstructions and 1-4 % of non-strangulating mechanical small bowel obstructions. It has a higher prevalence among the elderly and females, accounting for over 25% of non-strangulated mechanical small bowel obstruction in those over 65 years of age, though it can rarely occur in young adults[2]. The female predominance is because of the fact that gallstone diseases are about 4 times more prevalent among women. Despite medical advancements, the mortality rate for gallstone ileus remains high, ranging from 12-27 %. This high mortality rate is partly due to delayed diagnosis caused by non-specific symptoms and high misdiagnosis rates. 'Ileus' in Gallstone ileus is a misnomer as this condition is not a functional obstruction, rather a condition of mechanical obstruction. Gallstone ileus commonly occurs in chronic cholecystitis where, adhesions form between gallbladder and intestine (figure 1). The pressure effect and inflammation caused by the impacting gallstone leads to formation of cholecysto-enteric fistula.

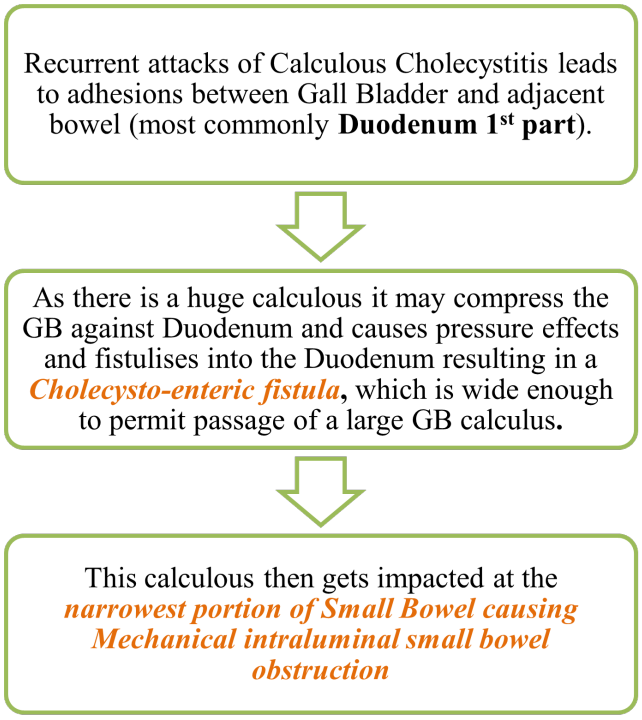


Figure 1. Pathogenesis of Gallstone Ileus.

Less commonly, the gallstone enters the intestine via dilated ampulla of Vater. There have been cases of gallstone ileus following endoscopic sphincterotomy, following laparoscopic cholecystectomy. Most frequently, fistula formation involves duodenum due to its proximity. But there are reports of fistula involving stomach, small bowel, colon. Bouveret syndrome is a rare form of gallstone ileus characterized by gastric outlet obstruction[3] secondary to impaction

Table 1. Modified Csendes *et al.,* classification system[4]

Type		Description
I		Extrinsic compression of Common Bile Duct by an impacted gallstone.
II		Cholecysto-biliary fistula secondary to an eroded gallstone involving one-third of the circumference of Common Bile Duct
III		Cholecysto-biliary fistula involving two-thirds of the circumference of Common Bile Duct
IV		Cholecysto-biliary fistula involving the whole circumference of Common Bile Duct
V		Cholecysto-enteric fistula
	V(a)	Without gallstone ileus
	V(b)	With gallstone ileus

of duodenum of pylorus by large gall stone. Gallstone ileus can also occur as a part of Mirizzi syndrome (stage Vb according to modified Csendes et al classification[4]).

If the gallstone enters the duodenum, the most common site of obstruction will be the terminal ileum and ileo-caecal valve due to its relatively narrow lumen and less active peristalsis. Usually stones less than 2.5cm are passed spontaneously via the GI tract uneventfully whereas stones more than 5cm are likely to be impacted[5]. The largest gallstone, causing intestinal obstruction, measuring 17.7 cm in the largest diameter, was removed from the transverse colon. Rarely, there have been cases of resolution of gallstone ileus with spontaneous evacuation of gallstones. Clinical signs and symptoms of gallstone ileus are often nonspecific. Nausea, vomiting, crampy abdominal pain and variable distension are commonly present. Symptoms can be intermittent due to tumbling phenomenon which can lead to delay in diagnosis. USG can be used to demonstrate stones, fistulas but difficulties in locating the stones and bowel distortions makes the diagnosis via USG limited. Plain abdominal radiograph can show classical 4 signs namely partial or complete intestinal obstruction, pneumobilia, aberrantly located gallstone, and change in location of the previously identified stone on serial films of which the first 3 signs constitute Rigler's triad[9]. Balthazar et al later described a fifth sign, which consists of two air fluid levels in the right upper quadrant on abdominal radiograph[6], but this sign is only seen in approximately 24% of patients at the time of admission. Study shows that the diagnosis of gallstone ileus is increased to 74% by combining plain abdominal radiograph with USG[7]. CT is stated to be superior to abdominal radiograph in diagnosing gallstone ileus with a sensitivity of 93%. Magnetic Resonance Cholangiopancreatography (MRCP), and Esophagogastroduodenoscopy (EGD) can be done in case of uncertainty after CT scanning. In our study we used abdominal radiographs and CT abdomen to diagnose the case of gallstone ileus.

4. Materials and Methods

Place – Government Medical College, Omandurar Government Estate. Specific imaging was done preoperatively after stabilising the patient. Adequate surgical management was performed promptly. Proper informed consent was attained from the patient.

5. Results

In our case report, the patient was diagnosed to have gallstone ileus, which was surgically removed via an enterotomy, and adequate resuscitation was done. Patient gradually recovered from ailment and was discharged with proper follow-up advice.

6. Discussion

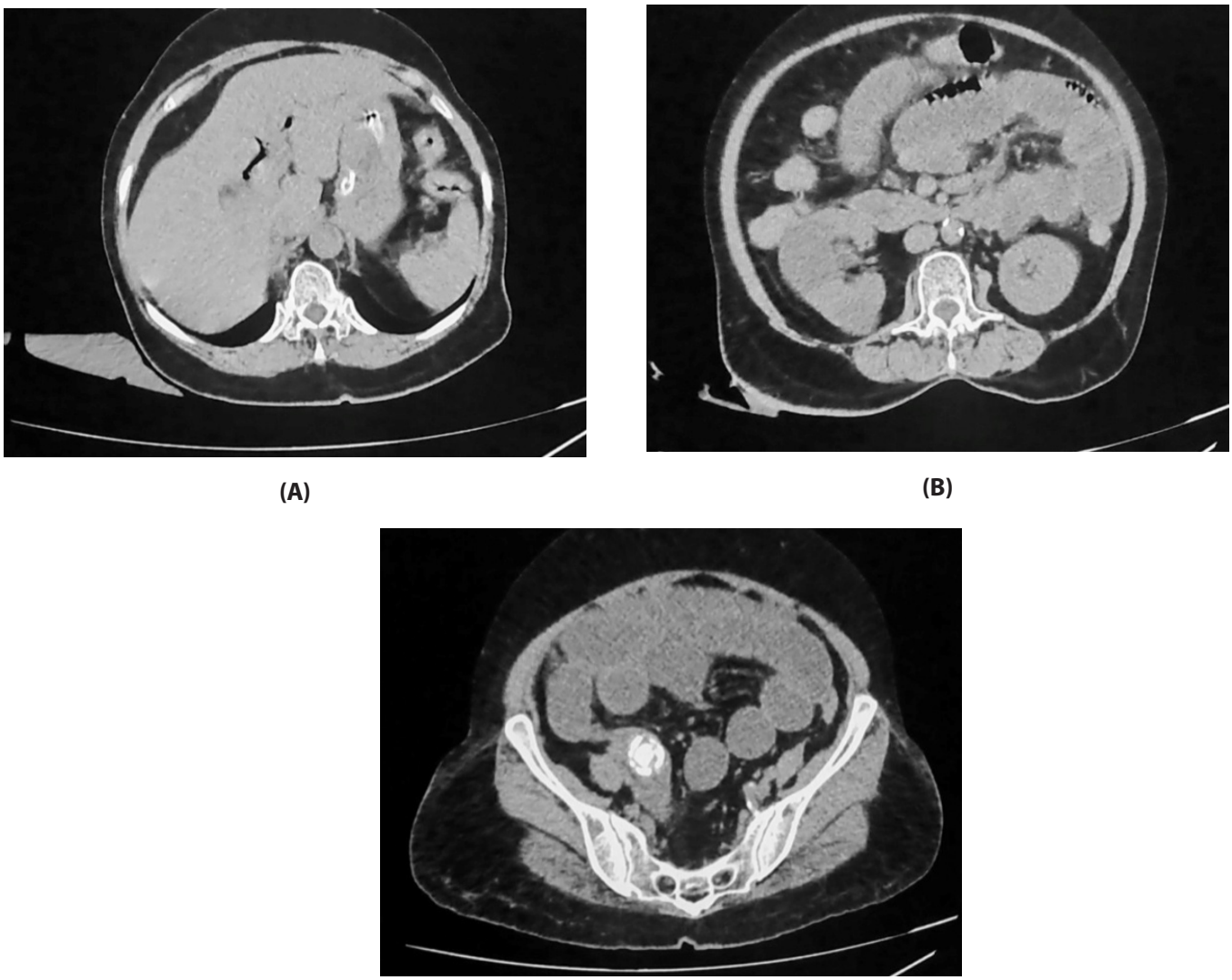
A 70 years old woman came with clinical features suggestive of acute small bowel obstruction and with hypotension shock. After adequate fluid resuscitation protocols, patient improved in her haemodynamic condition. A CT scan of the abdomen was taken, which revealed small bowel dilation with a transition point in the distal ileum, pneumobilia, and a calcified foci in the RIF (Figure 2).

Patient was promptly taken up for an emergency laparotomy, and the following findings were noted – Dilated small bowel (both jejunum and ileum), hard intraluminal mass lesion in the terminal ileum 3 to 5 cm proximal to the Ileo-caecal junction (Figure 3(a)). Liver under-surface revealed dense adhesions between duodenum and the supposed site of gallbladder. An enterotomy (Figure 3(b)) was performed proximal to the site of gallstone impaction, and the gallstone was milked via the enterotomy (Figure 3(c)), which was later closed in single layers (Figure 3(d)). No attempt was made to explore the bilio-enteric communication due to the dense adhesions and to avoid inadvertent injury to the biliary tree.

Abdomen closed in layers with a drain *In-situ*. Patient was shifted to the ICU and postoperative period was uneventful. Patient was gradually started on oral feeds and discharged on the 10th postoperative day.

7. Summary and Conclusion

Acute small bowel obstruction via gallstone is a very rare presentation of gallstone disease that is almost always due to a bilio-enteric fistula or a cholecysto-enteric fistula. Prompt identification and treatment are necessary to prevent complications like perforation,



(A) **(B)** **(C)**

Figure 2. Showing Rigler's triad for a case of Gallstone ileus in a 70 years old female. **(a)** showing pneumobilia in right and left intra-hepatic ducts. **(b)** Dilated bowel loops of small bowel obstruction. **(c)** Calcified foci seen in the RIF at the region of the Terminal ileum, which is the most common location for gallstone impaction.

biliary peritonitis, etc. Surgical management can be done in a two staged procedure where initially the small bowel obstruction is relieved and later, once patient's general condition improves, proper imaging has to be done to reveal the bilio-enteric fistula, which can then be excised surgically[8,9].

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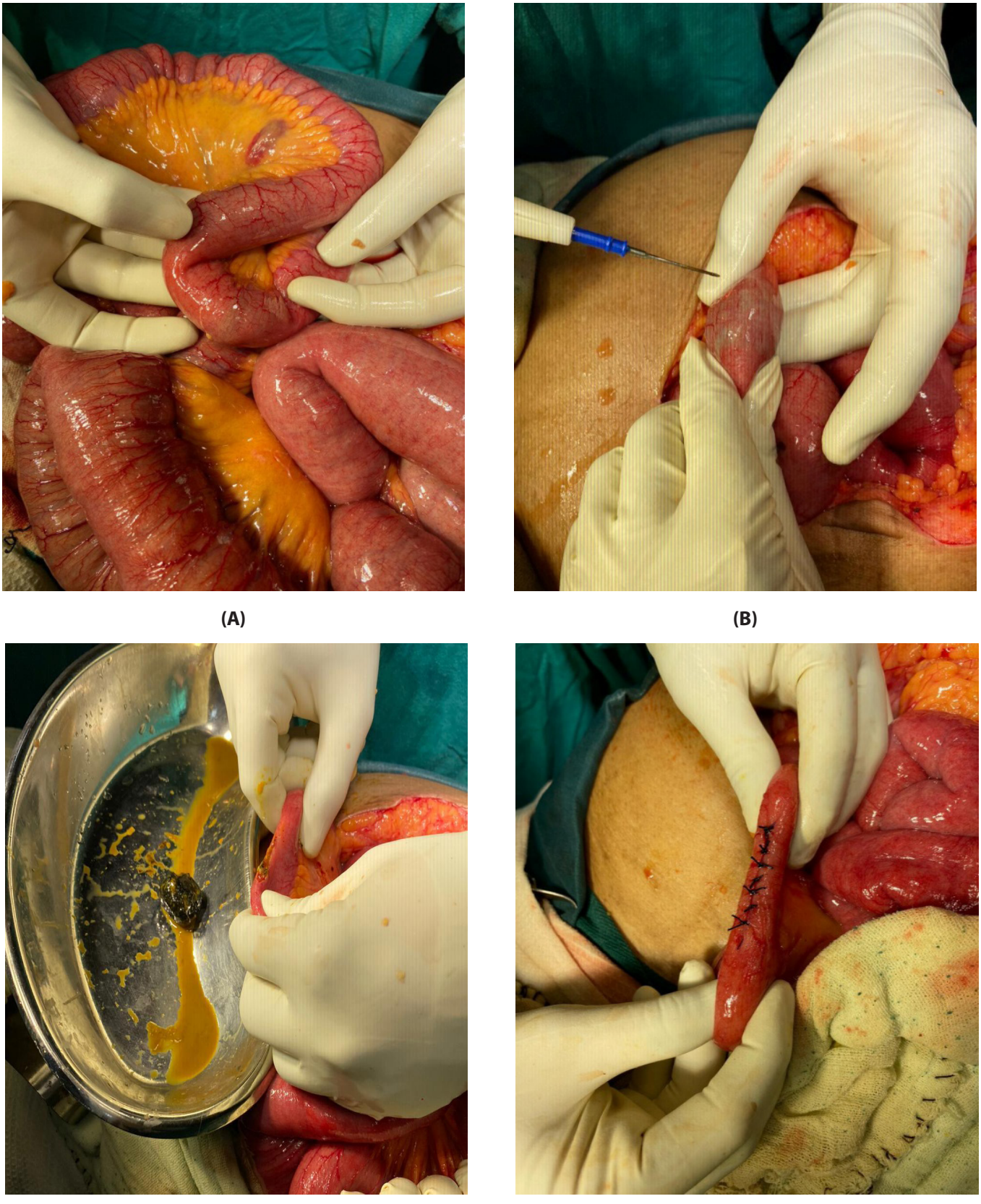

(A) **(B)**

(C) **(D)**

Figure 3. Showing the operative steps of a gallstone ileus.

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