



A RARE CAUSE OF SMALL BOWEL OBSTRUCTION: GALL STONE ILEUS – A RADIOLOGICAL CASE REPORT WITH REVIEW OF LITERATURE

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Abstract

Small bowel obstruction (SBO) is a common clinical condition. The effective management depends on an early and accurate diagnosis. Gall stone ileus is a rare cause of mechanical small bowel obstruction and contributes to 1-4% of all cases of mechanical small bowel obstruction. The incidence is typically seen in elderly females. The diagnosis is often difficult and a previous history of gall stone disease helps in reaching the correct diagnosis. Surgical management is the preferred modality for treatment. We are reporting a case of Gallstone ileus diagnosed recently in our hospital. A 54 year old elderly female presented with sudden onset abdominal pain with recurrent vomiting for one day. A Plain radiograph of abdomen done in Emergency department suggested findings of small bowel obstruction. It was followed by an urgent ultrasound of abdomen which showed collapsed Gall bladder, pneumobilia and dilated non-peristaltic small bowel loops. Finally a contrast enhanced CT scan of abdomen was done and it showed air within in the biliary tree and within the collapsed Gall bladder. The Small bowel loops were dilated to the upper border of a large radiolucent intraluminal filling defect in the distal ileum. It also showed loss of clear interface between Gall bladder and second part of duodenum suggesting a possibility of Cholecystoenteric fistula. The patient underwent an urgent laparotomy with enterolithotomy. A 35 x 35mm calculus was impacted in the distal ileum. A fistulous communication was noticed between Gall bladder and the second part of duodenum which was repaired along with cholecystectomy.

Keywords: Mechanical small bowel obstruction, pneumobilia, gall stone ileus, cholecystoenteric fistula, enterolithotomy.

1. INTRODUCTION

Small bowel obstruction is a common surgical cause for hospital admissions, representing 20% of all surgical admissions for acute abdominal pain^[1,2]. It is often due to mechanical obstruction of the lumen preventing normal transit of the enteric contents. The important conditions

leading to mechanical small bowel intestinal obstruction includes adhesions, neoplasms, bezoars, foreign bodies, congenital anomalies, volvulus, intussusceptions and Gall stones^[3]. Gallstone ileus is a rare and potentially serious complication of cholelithiasis^[4]. Gall stone ileus is a less known cause of mechanical obstruction of small intestine; however it remains a serious surgical condition

with high morbidity and mortality often due to a delayed diagnosis. It contributes to 1%-4% of all cases of mechanical small bowel obstruction with a female to male ratio of 3.5-6.0:1^[5,6,7,8]. Here, we report radiological findings in a case of gallstone ileus and review the literature of this rare disease.

Case Report:

A 54 year old woman presented to our emergency department with a history of abdominal pain and recurrent vomiting for two days. She had no past history of any comorbid medical condition but had a history of cholelithiasis.

The hemoglobin was 11gm%, White blood cell count: 13400/cumm, Blood urea: 38mg/dl, Serum creatinine:1.2 mg/dL. The other laboratory tests were normal.

A plain abdominal film showed dilated small bowel loops suggesting small bowel obstruction (**Figure 1**). An Ultrasound of abdomen showed a collapsed Gall bladder with air within and in the biliary tree without stones in the Gall bladder or in the biliary tree. It also disclosed non-peristaltic dilated small bowel loops. The US was followed by a contrast enhanced abdominal computed tomography which confirmed air within the collapsed Gall bladder and within biliary tree (**Figure 2**). Another interesting finding was loss of clear interface between the collapsed Gall bladder and second part of duodenum (**Figure 3 and 4**). It also showed dilatation of the small bowel loops with a transition zone in the distal ileum, where an intraluminal radiolucent filling defect measuring 35 x 32mm was localised (**Figure 5 A, B**). The imaging impression given after abdominal computed tomography was Gall stone ileus with an impacted stone in distal ileum with a possibility of cholecystoduodenal fistula. The patient had to undergo an urgent laparotomy. Per operatively the Gall bladder was collapsed with almost non-existing wall, showing dense adhesions with second part of duodenum. A large stone was palpated in the distal ileum which was removed by doing an enterolithotomy (**Figure 6A**). It was black coloured ovoid

shaped and measured about 40mm

(**Figure 6B**). Finally a cholecystectomy followed by repair of the fistulous tract was done in the one setting. The pathological diagnosis was chronic cholecystitis and a cholecystoduodenal fistula walled by granulation tissue. The post-operative course was uneventful. Currently the patient is doing well.

Discussion:

Cholelithiasis is a common clinical condition worldwide with highest prevalence in United States (10%)^[9]. The risk factors are female gender, increasing age, fecundity, obesity, diabetes, and pregnancy. It is symptomatic in 20%-30% of patients, with biliary colic being the most common symptom^[10]. In patients with a history of biliary colic, the annual risk of acute cholecystitis or any other serious complications of gallstones is about 1% to 2% per year^[11]. The complications of cholelithiasis are acute cholecystitis and its associated complications like gangrenous cholecystitis, empysematous cholecystitis, perforation and torsion of Gall bladder. In longstanding cases, chronic calculous cholecystitis is a known entity. Few other important common complications attributed to cholelithiasis are acute pancreatitis and choledocholithiasis. Mirizzi syndrome and cholecysto-enteric fistulas are uncommon complications.

Gallstone ileus is a rare complication of cholelithiasis. It is seen in 0.3% to 0.5% of all cases of Gall stone disease. Bartolin in 1654 first gave the term "gallstone ileus" in reference to mechanical small bowel obstruction by impaction of one or more large gallstones in the the alimentary canal. It accounts for 1% to 4% of all causes of mechanical obstruction of the small intestine in patients over 65 years of age^[12,13,14,15,16]. The understood mechanism for gall stone ileus is formation of a fistula between gall bladder and the gastrointestinal tract. The stone enters the gastrointestinal tract through fistulous tract. The most common pattern seen with gall

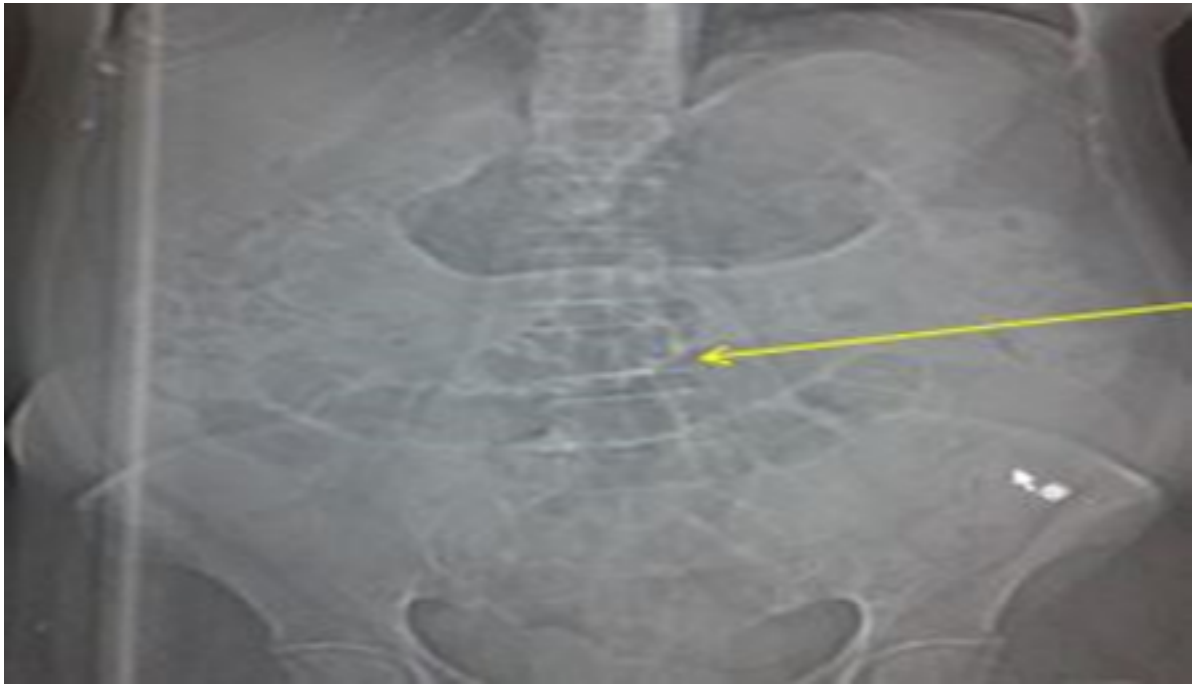


Figure 1: Plain abdominal film showing dilated small bowel loops, however no ectopic radio-opaque stone could be seen

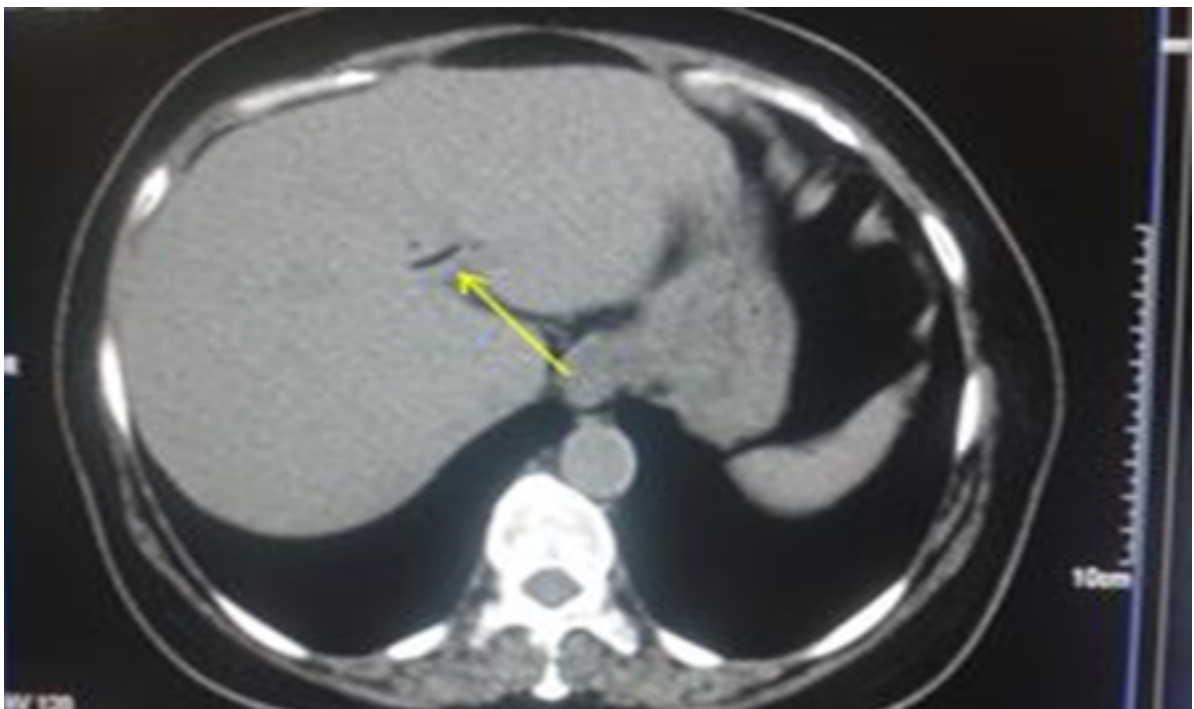


Figure 2: Axial section of plain abdominal CT shows air in the biliary tree.

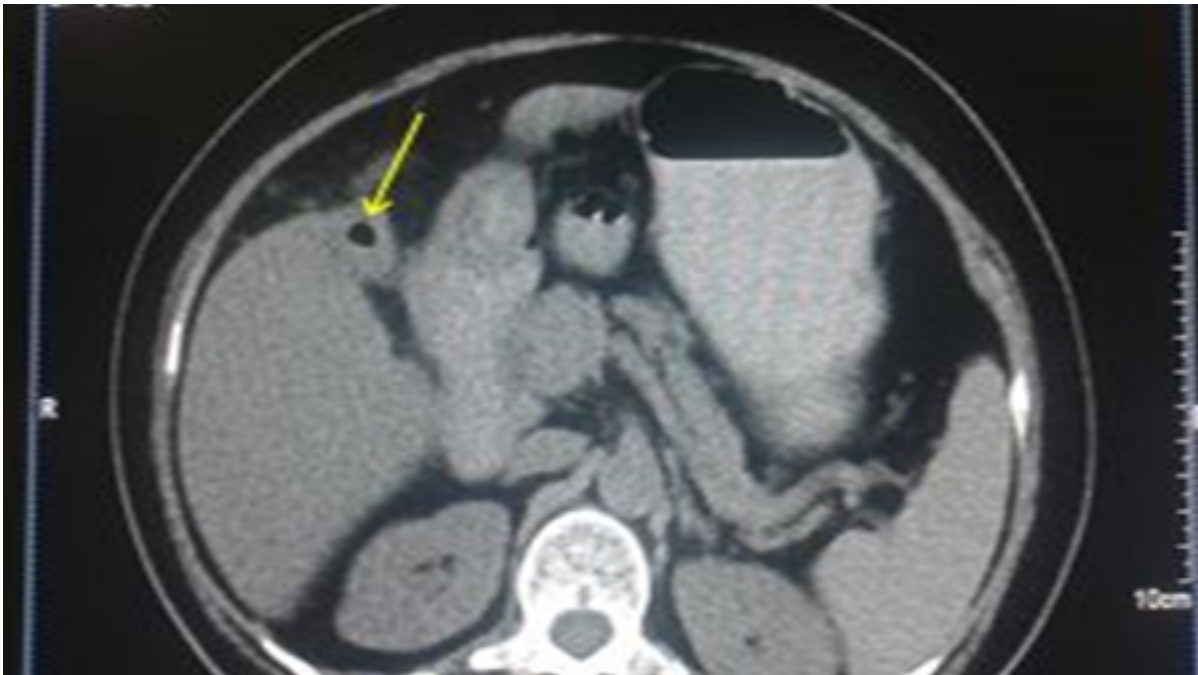


Figure 3: Axial section of abdominal computed tomography shows collapsed Gallbladder with air within.

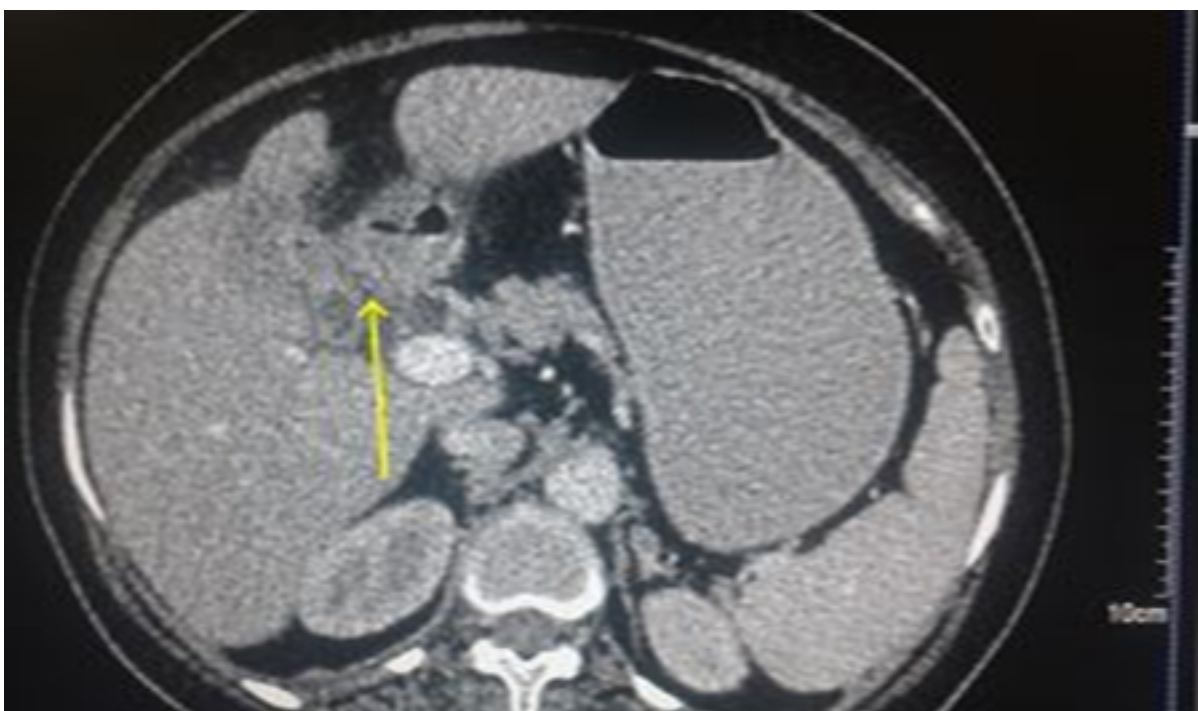


Figure 4: Axial section of contrast enhanced abdominal computed tomography shows collapsed Gall bladder showing loss of clear interface with adjacent duodenal loop

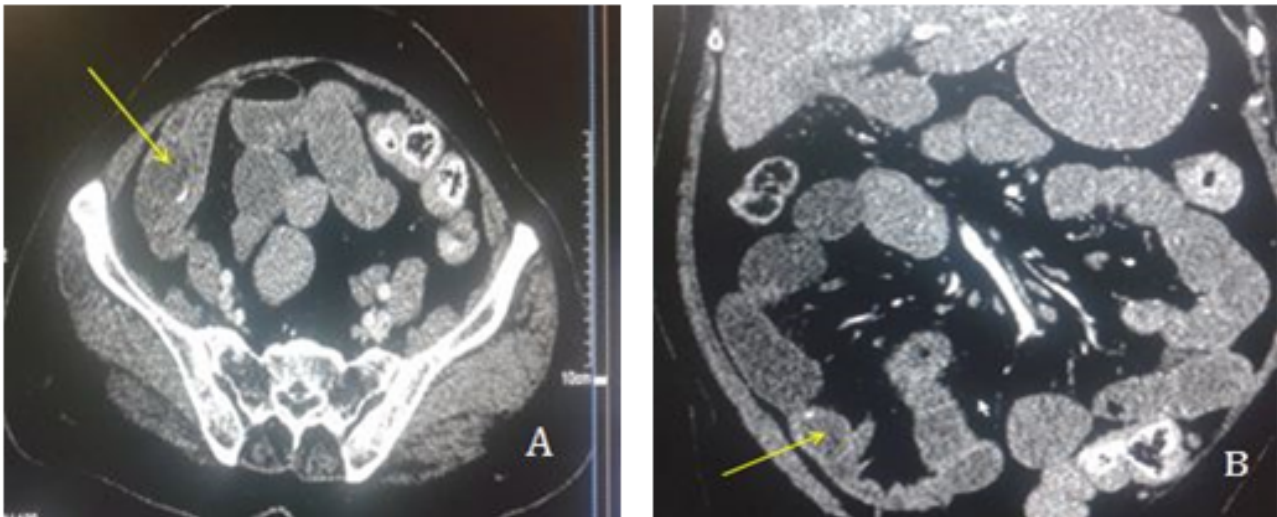


Figure 5: (A, B): Axial (A) and coronal (B) sections of abdominal computed tomography show an ectopic stone in distal ileum

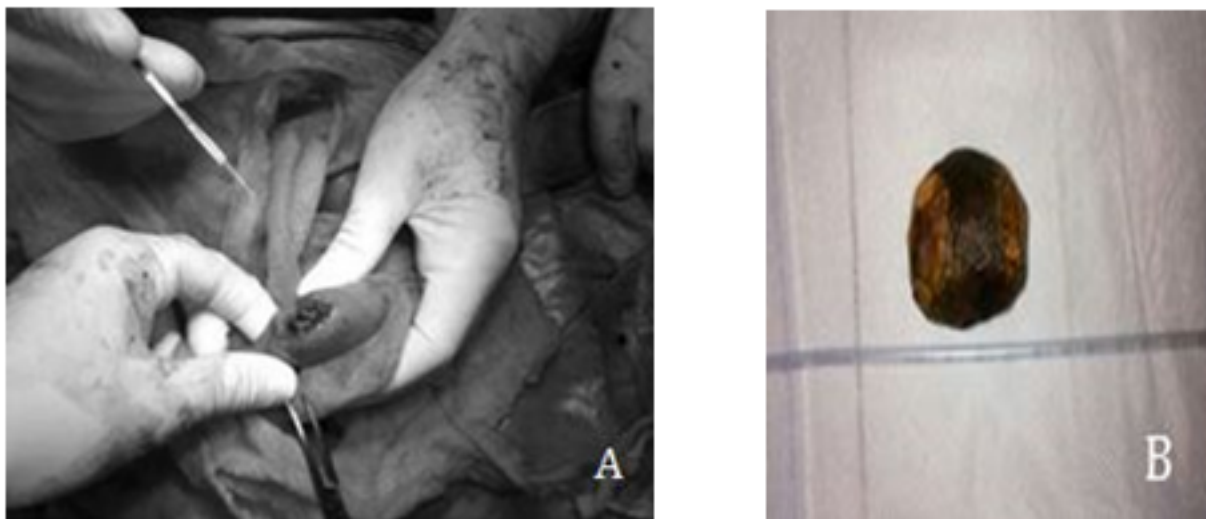


Figure 6: (A, B): Impacted Gall stone (A) being extracted from distal ileum. (B): Extracted Gall stone.

stone ileus is a cholecysto-duodenum fistula, when a sufficiently large stone enters the alimentary canal through a fistula between gall bladder and first/second part of duodenum. The other possibilities are Cholecysto-colonic and cholecystogastric and choledocho-enteric fistulas. The size of stone should be more than 2-2.5 cm in diameter to cause obstruction^[8]. Such a large stone after entering into the gastrointestinal tract after eroding through gall bladder can get impacted in any part of the alimentary canal; however termi-

nal ileum remains the commonest location of impaction because it is the narrowest portion of the small bowel. Jejunum and ligament of treitz are other common sites of impaction. Impaction of stone in the stomach and large bowel is relatively uncommon.

The clinical presentation of gall stone ileus is fairly non-specific and may vary depending on the site of impaction of the stone. There is often a short history of upper abdominal pain with recurrent nausea and vomiting.

Gall stone ileus contributes to significant morbidity and mortality due to delayed and often inaccurate diagnosis. It is difficult to diagnose unless a history of cholelithiasis is forthcoming.

The findings in a plain radiograph of abdomen are often non-specific. The consistent finding seen is dilated small bowel loops. Since most of the gall stones are radiolucent, they are not visualized in a plain film. One should have a high index of suspicion to detect air in the biliary tree in a plain film. Rigler triad refers to classic triad of mechanical small bowel obstruction, pneumobilia and an ectopic gall stone. Ultrasound is an important diagnostic tool. It shows collapsed gall bladder with pneumobilia and dilated small bowel loops. With high index of suspicion, it is possible to trace a calculus at the zone of transition.

CT remains the diagnostic imaging modality in gall stone ileus. As compared to a plain radiography or ultrasound, it demonstrates all specific findings with better resolution in a shorter span with high accuracy. It localises the ectopic stone and demonstrates the site of fistula. A study by Lassandro *et al*^[17] compared the clinical utility of plain abdominal radiograph, Ultrasound and computed tomography in evaluating 27 patients of gallstone ileus, and conclude that the Rigler's triad presents 14.81% in plain radiograph of abdomen, 11.11% in ultrasound, and 77.78% in computed tomography, respectively. Another study by Yu *et al*^[18] assesses the value of abdominal computed tomography in the diagnosis and management of gallstone ileus and concluded that the abdominal CT offers crucial evidence not only for the diagnosis of gallstone ileus but also for decision making. The diagnosis is often difficult and delayed. In upto 50% cases, it is diagnosed during laparotomy^[7].

The surgical management includes urgent laparotomy and enterolithotomy, cholecystectomy and repair of fistula in the same or more than one setting. All the intestinal segments should be inspected to exclude a possibility multiple ectopic

stones.

The prognosis is usually not good if the diagnosis is delayed. Studies done in past report a mortality rate of 7.5%-15%^[7,8], mainly due to delayed diagnosis and comorbid conditions such as cardiorespiratory disease, obesity and diabetes mellitus.

Conclusion:

To conclude, gallstone ileus is a rare cause of mechanical obstruction. It should be taken in account if an elderly patient with a previous history of cholelithiasis presents with intestinal obstruction. Abdominal computed tomography is preferred because of high sensitivity and specificity and its ability to offer an early diagnosis. Urgent surgical intervention is required if the radiological findings are confirmatory of the diagnosis.

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