



Case Report

Gallstone Ileus – A Recapitulation

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Background

Gallstone ileus is one of the rare causes of intestinal obstruction wherein a large gallstone gets impacted at the narrowest part of the bowel leading to bowel obstruction. It is one of the most infrequent complications of gallstone disease. The most common site for obstruction is ileo-caecal junction because of the narrow calibre of the bowel. The patients usually have an active cholecysto-enteric fistula through which the stone slips into the bowel and thus causing symptoms. This condition is commonly seen in elderly population who recently had an episode of cholecystitis. Treatment depends on presentation and comorbid illness.

Case Presentation

A septuagenarian gentleman with multiple medical co-morbidities Stage 3 Chronic kidney disease, Type 2 diabetes mellitus, hypercholesterolemia, splenectomy at the age of 5 years for hereditary spherocytosis and exertional dyspnoea presented to Emergency department with ongoing abdominal pain with multiple episodes of vomiting lasting for nearly 3 days. He was known to have gallstones and was awaiting laparoscopic cholecystectomy. On examination, patient was tachycardic with pulse rate of 98 beats per minute. His blood pressure and oxygen

saturation were within normal limits. He was visibly dehydrated due to multiple episodes of vomiting. His abdomen on examination showed a diffuse tenderness but no signs of peritonitis. Abdomen was not distended that could be attributed for his persistent vomiting.

Investigation

In view of his presentation and a suspicion of bowel obstruction abdominal X-ray was done that showed dilated loops of small bowel resembling a stack of coin appearance (figure 1). Routine blood investigations done showed normal haemoglobin levels 149 g/L (reference range 130-180 g/L), raised WCC $11.5 \times 10^9/L$ (reference range $4-11 \times 10^9/L$), deranged renal parameters like eGFR of 18ml/min (Normal: $>60ml/min$), Creatinine of 280umol/L (Normal 64-104umol/L) and urea of 17.2mmol/L (Reference range 2.5-6.7mmol/L). His CRP at the time of presentation was 49mg/L (Normal $<10mg/L$). His bilirubin during admission was 41umol/L (normal 3-21umol/L), rest of the liver functions were normal. Blood investigations were consistent with pre-renal azotemia secondary to bouts of vomiting. A CT scan was ordered to look for an obvious transition point. The CT scan identified gallstone ileus wherein a large gallbladder stone was impacted in distal small bowel that attributed

to patient's symptomology (figure 2). The CT scan also made a note of an active fistula between the gallbladder and first part of duodenum due to presence of air in the intra-hepatic biliary radicals. The initial resuscitation with intravenous fluids to

correct dehydration was immediately commenced. A Foley's catheter was inserted to monitor his urine output. Ryle's tube inserted to relieve abdominal distension and to prevent aspiration pneumonia.

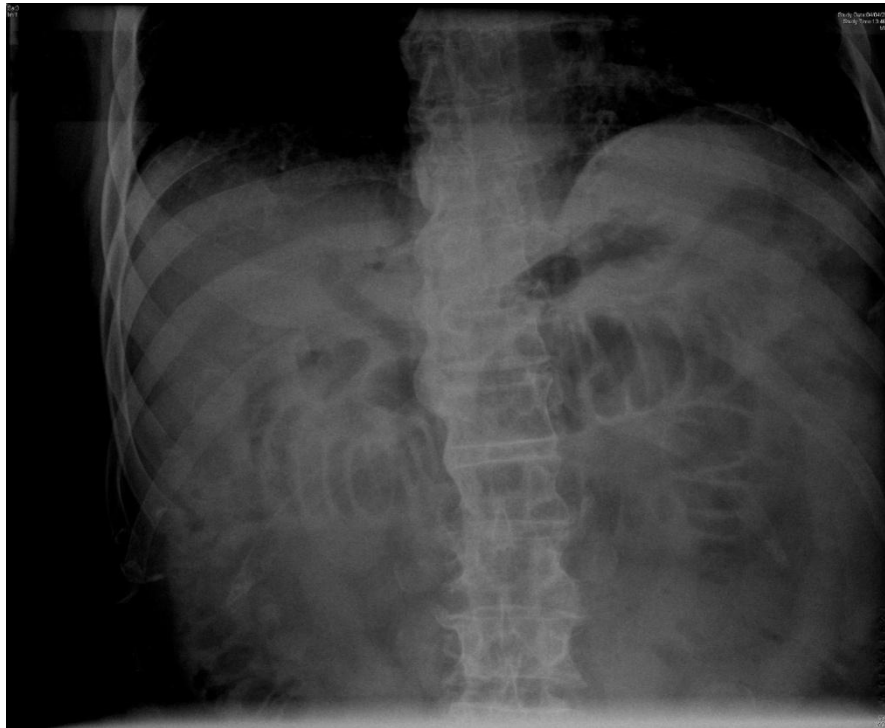


Figure 1: Xray showing dilated small bowel loops.

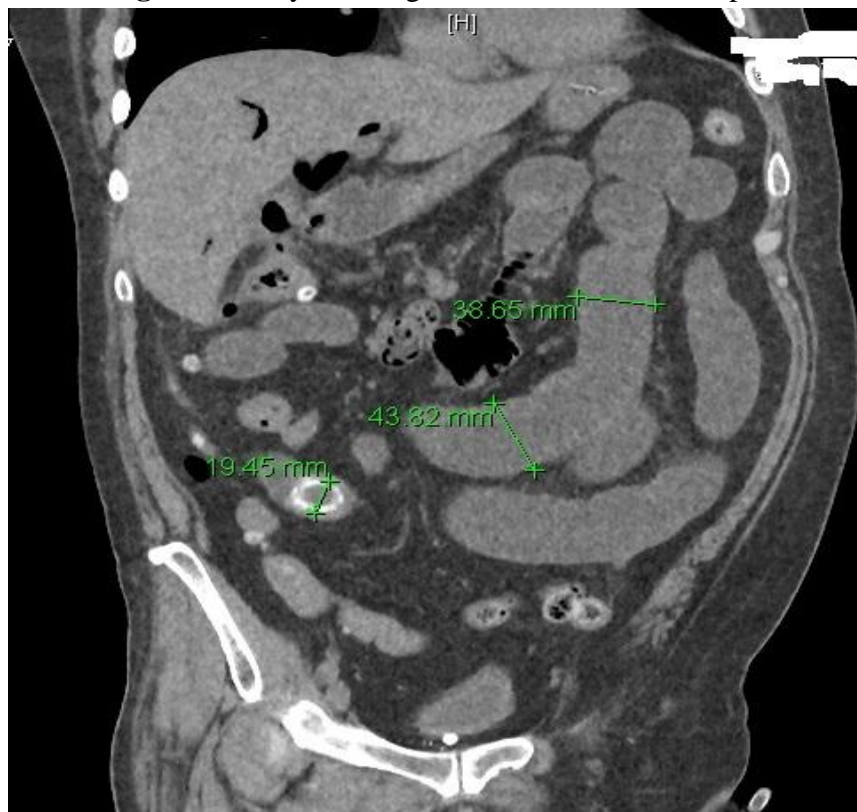


Figure 2: Axial view CT image showing a large gallstone impacted in distal small bowel with subsequent proximal dilatation of bowel. Air in the intra-hepatic biliary radicals noted.

Treatment

The patient's presentation with high grade mechanical small bowel obstruction warranted an immediate laparotomy. During laparotomy, multiple gallstones were identified within the lumen of small bowel. Enterotomy was performed and stones were extracted out.

Outcome and Follow-Up

The patient had a prolonged recovery from ileus warranting a continuous naso-gastric drainage for almost 5 days after the surgery. With the background history of splenectomy and multiple medical co-morbidities, patient started spiking temperatures after third post-operative day. Patient was managed with broad spectrum antibiotic to treat sepsis. He underwent a CT scan of his chest and abdomen on sixth post-operative day to look for cause of his fever. CT scan of his chest showed basal consolidation with peripheral patchy ground-glass opacities that was consistent with COVID pneumonia. CT scan of his abdomen showed no concerning features. COVID swabs were taken and patient turned to be positive. Patient was continued with same line of management with oxygen support and input from the medical team. At tenth post-operative day patient required CPAP mode of ventilation to maintain his saturations. Patient deteriorated further needing invasive ventilation. Unfortunately, patient succumbed to COVID pneumonia after 3 weeks following surgery.

Discussion

Gallstone ileus is one of the rare causes of intestinal obstruction. It accounts to 1 to 4 percent of cases presenting as mechanical small bowel obstruction⁽¹⁾. The incidence of gallstone ileus increases with advancing age and is three times more common in females than males. It is commonly seen in elderly population of age greater than 65 years, frail and patients with multiple medical comorbidities⁽²⁾. Gallstone ileus is one of the rare complications of cholelithiasis

and the incidence is 0.3 to 0.4%⁽³⁾. The recurrence rate of gallstone ileus is 5-8%⁽⁴⁾

The pathology for gallstone ileus involves a fistulous communication between the gallbladder and the bowel. Gallstone ileus is seen in patients who had a recent episode of acute cholecystitis. The inflamed gallbladder forms adhesions with the surrounding structures. The ongoing inflammation and the pressure effect of the gallstone on the gallbladder wall causes erosions and thereby leading to fistulous communication between the gallbladder and adhered portion of the bowel. The newly formed tract would easily allow passage of gallstone into the lumen of the bowel⁽⁵⁾. Though the fistula can occur in any part of the bowel, the most common location for cholecysto-enteric fistula is the duodenum due to its proximity with the gall bladder. The gallstones that pass through this fistula, if larger than 2 cm in size, has high propensity to get impacted. The most common site of impaction is terminal ileum close to ileocecal valve due to narrow calibre of the bowel⁽⁶⁾.

The main clinical presentation of gallstone ileus is abdominal pain that is generalized and colicky in nature due to bowel obstruction. The pain is usually associated with bilious or feculent vomiting depending on the level of obstruction. Very rarely patients present with coffee-ground vomiting that occurs as a result of erosion of gastroduodenal artery due to impacted stone. Other rare presentations of gallstone ileus reported in the literature include gangrenous appendicitis with a gallstone impacted at the base of the appendix⁽⁷⁾, or intussusception with the stone acting as a lead point⁽⁸⁾.

The various imaging modalities used in the diagnosis of gallstone ileus is plain abdominal X-ray that identifies the loops of dilated small bowels proximal to obstruction. X-rays generally do not identify gallstones intra-luminally as majority of gallstones are radiolucent. Ultrasound examination in addition to plain radiograph films increases the sensitivity to 70%. CT scan has high sensitivity about 93% in diagnosis of gallstone

ileus and also identifies the location of the stone⁽⁹⁾. The pathognomonic imaging diagnostic criteria for gallstone ileus is Rigler's triad. The triad includes air in the biliary tract, intestinal obstruction and presence of aberrant gallstones⁽¹⁰⁾.

Most of the patients with gallstone ileus would warrant a surgical intervention. Surgical methods generally include a single stage or a two-stage procedure. Two-stage procedure would involve extraction of stone with enterotomy on the first instance followed by closure of fistula thereafter. On some occasions the fistula tract is excised along with a cholecystectomy as a single procedure⁽¹¹⁾. Very rarely bowel resection is carried out if there is super-added perforation⁽¹²⁾. The mortality due to gallstone ileus remains as high as 20% and is mainly attributed to advanced age of presentation along with other medical comorbidities⁽¹³⁾.

Learning Points

- 1) Presence of air in the biliary tree should prompt a suspicion of cholecysto-enteric fistula after a long-standing gallstone disease.
- 2) High index of suspicion for gallstone ileus for patients presenting with features of small bowel obstruction with a history of cholelithiasis.
- 3) Early surgical intervention to relieve obstruction and prompt cholecystectomy to prevent recurrence thereafter should be mandated.

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