

DOI: 10.21802/gmj.2020.1.4

Dawood Iqbal Wani^{1*}, Satish Parihar¹, Ankit Prabhakar², Nasib Chand Digra¹, Ab Hamid Wani¹**A Rare Case of Large Impacted Stone in Jejunum Causing Obstruction in a Patient of Gallstone Ileus**¹ Government Medical College, Jammu, India² Government Medical College, Srinagar, India

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Abstract: Gallstone ileus is a rare complication of cholelithiasis that occurs as a result of occlusion of the intestinal lumen by a large sized gallstone accounting for 1-4% cases of small bowel obstruction. The aim of this work is to introduce a case report that emphasize the diagnostic and therapeutic management of gallstone ileus with an enterolith impacted in jejunum (an uncommon site).

Keywords: *gallstone ileus; intestinal obstruction; enterotomy.*

Background: Gallstone ileus is a rare complication of cholelithiasis that occurs as a result of occlusion of the intestinal lumen by a large sized gallstone. It accounts for 1-4% cases of small bowel obstruction with higher incidence in females as compared to males [1, 28, 29]. About 0.3-0.5% of patients having cholelithiasis are represented as gallstone ileus [2]. Gallstones enter via a pathologic biliary-enteric fistula into the intestinal tract, most commonly between the gallbladder and the duodenum seen in 55-75% cases [3]. These stones usually become impacted in the terminal ileum with only 15% cases having stone impacted in distal jejunum [4,5]. There are no previous hepatobiliary symptoms in 50% of patients with gallstone ileus [6]. Contrast enhanced computed tomography (CECT) scan of the abdomen is the investigation of choice for gallstone ileus. Rigler's triad of pneumobilia, small bowel obstruction and ectopic gallstones is found in 78% of cases with gallstone ileus in CECT abdomen [6,7]. However, the preoperative diagnosis of this entity is quite difficult due to ambiguous presentation and radiologic findings [8].

Surgery is the mainstay treatment without a clear consensus about best surgical approach that should be adopted; whether one-staged versus two-staged approach and open versus laparoscopic approach. Laparotomy is the conventional approach; however, laparoscopy is recently increasingly used by experienced surgeons. The treatment is surgical removal of the gallstone with or without excision of the biliary-enteric fistula during the same procedure depending on the patient's general condition [9].

The aim of this work is to introduce a case report that emphasize the diagnostic and therapeutic management of gallstone ileus with an enterolith impacted in jejunum (an uncommon site).

We herein describe our experience with a case that presented with features of intestinal obstruction due to gallstone ileus. The site of stone impaction was unusual in our case, where the stone was impacted in distal jejunum. It was finally managed by open enterolithotomy followed by primary closure of jejunum.

Case presentation:

We report of the case of a 55-year-old female with no underlying medical comorbidities. She was brought to our emergency department with a six days' history of diffuse colicky abdominal pain, repetitive vomiting and abdominal distention. There was no previous history of biliary symptoms. Her vital signs showed a heart rate of 96 beats per minute, blood pressure

of 136/84 mm Hg, respiratory rate of 22/min and a temperature of 37°C. Abdominal examination revealed a moderate abdominal distention, mild epigastric tenderness. No rebound tenderness and no guarding was noted. Laboratory investigations revealed normal baseline parameters. Kidney and liver function tests were unremarkable.

The patient was initially resuscitated with intravenous fluid, nasogastric tube was inserted for abdominal decompression and indwelling catheter was inserted for monitoring urine output.

A contrast enhanced computed tomography scan of the abdomen was done, that exhibited biliary system dilatation with coexisting pneumobilia, (Fig. 1). Additionally, CT showed dilated small bowel (duodenum and proximal jejunum) with adjacent collapsed small and large bowel loops (Fig. 2). However, no definite transition point or hyperdense obstructing enterolith could be visualised. Hence, a decision was made to undergo diagnostic laparoscopy, which revealed dilated small bowel loops and bulging intraluminal content in distal jejunum, about 90cm distal to ligament of Treitz (Fig. 3). Dense adhesions were seen between contracted gallbladder and duodenum. A possibility of enterolith was taken into consideration and diagnosis of gallstone ileus was made. Thus, a decision for an exploratory laparotomy was taken to relieve the obstruction. An enterolithotomy was performed over a healthy segment of jejunum few centimeters proximal to the transition zone (Fig. 4). It demonstrated an oval shaped stone measuring 5.7×3.2 cm approximately in size (Fig. 5). A longitudinal incision was performed to remove the stone and the defect was closed primarily in a single layer in longitudinal fashion using an absorbable suture (Fig. 6). Manual inspection of the entire small and large bowel was done; it revealed no other stones or abnormalities. The right upper quadrant of peritoneal cavity was examined, which revealed very dense adhesions between the gallbladder and the duodenum. No evidence of any retained stone in gallbladder was seen and therefore, gallbladder was not manipulated and the fistula was not excised to avoid causing injury or bleeding. The patient stayed postoperatively for 8 days and her hospital stay was uneventful. She was followed up in the outpatient clinic and she remained asymptomatic.

Discussion

Gallstone ileus is an entity that occurs due to formation of an aberrant fistula between the biliary tract and the gastrointestinal tract. Persistent erosion and necrosis of the gallbladder wall causes inflammation. This inflammation then spreads to the adjacent adherent intestinal segment close to the site of the impacted gallstone; leading to formation of a fistula [10-13]. Typically, when the size of the stone exceeds the calibre of the bowel lumen, the stone gets impacted. The minimum size that is most commonly quoted is two centimeters [10]. Terminal ileum is the commonest site of impaction (75%) [14]. Other locations include the duodenum (Bouveret Syndrome), proximal ileum,

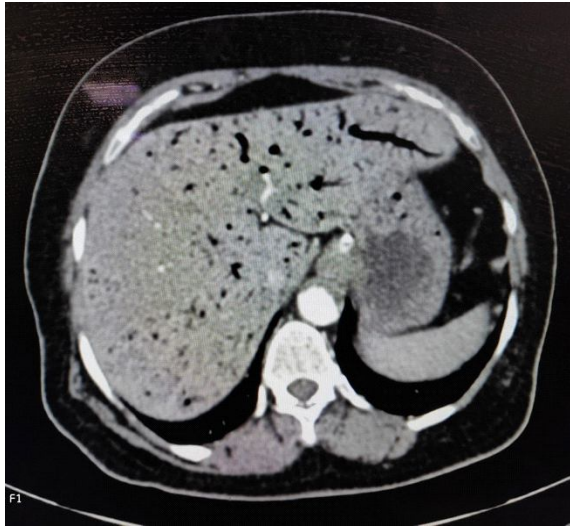


Figure 1: Axial CECT Abdomen view showing dilated IHBRs with pneumobilia



Figure 2: Coronal CECT Abdomen showing dilated small bowel loops



Figure 3: Diagnostic laparoscopic view showing dilated jejunal loop with bulge in lumen due to intraluminal content



Figure 4: Intraoperative view of retrieval of stone from jejunal lumen using enterolithotomy.



Figure 5: Postoperative specimen of the retrieved stone

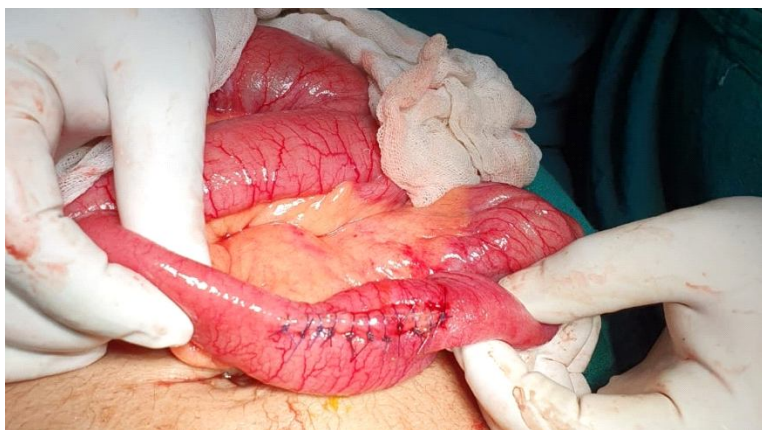


Figure 6: Primary closure of the defect using absorbable suture.

jejunum, stomach or colon [10,15,16]. Gallstone ileus most commonly manifests itself in the form of bowel obstruction [17,10,11,14]. Mechanical bowel obstruction secondary to gallstones is a rare manifestation of biliary disease occurring in 0.3–1.5% cases of cholelithiasis [18]. It accounts for 1–4% of all mechanical bowel obstructions. Bowel obstruction may be intermittent in nature, the “tumbling phenomenon” [10,17,18]. This may lead to the delayed manifestation sometimes seen in this entity. The average lag time between onset and manifestation of symptoms is 4 to 8 days [10,13,14,16].

The imaging modalities most frequently used to make the diagnosis of gallstone ileus include: Plain abdominal X-ray, ultrasound and contrast enhanced computed tomography (CECT) scan of the abdomen. The classic triad, quoted by Rigler et al. in 1941 [19], describes the radiographic features as: small bowel obstruction, pneumobilia and an ectopic gallstone in the gastrointestinal tract that changes location on serial X-ray films. Presence of two out of these three criteria is pathognomonic for gallstone ileus. This classic triad occurs at a rate of 15–50% in plain abdominal radiographs [10,17,19,20]. Abdominal ultrasonographic examination helps by detecting the presence of gallstones, pneumobilia and fistula tract [20]. It is much more sensitive for detection of pneumobilia than abdominal radiographs [17]. CECT abdomen is the most sensitive and specific modality for gallstone ileus [17,20,21,22] being 93% sensitive and 100% specific [22]. It can detect pneumobilia, gallstones, fistula tract, small bowel obstruction and transition site with enterolith. By determining the viability of the affected bowel segment, CT scanning with IV contrast adds benefit preoperatively, as this can help in decision making and guide the proper therapeutic approach [22]. The correct preoperative diagnosis is made in only 50% of cases despite the availability of the described imaging modalities [23].

The definitive management of gallstone ileus includes relief of the bowel obstruction and removal of the impacted stone. Patient’s condition must be optimised well before surgery, as the preoperative status impacts the operative method to be used [18].

There are 3 approaches for the management of gallstone ileus according to the literature: Enterolithotomy alone, Enterolithotomy coupled with cholecystectomy and fistula closure (one-stage procedure), Enterolithotomy followed by delayed cholecystectomy at a later time, typically 4–6 weeks (two-stage procedure) [10,16,17].

Enterolithotomy involves identification of the stone within

the GIT followed by making a longitudinal incision in a healthy segment of bowel just proximal to the site of impaction. The stone is then extracted and rest of the bowel is then assessed for the presence of other stones. The incision is then sutured in a transverse fashion [15,16,17]. However, there is a risk of repeated impaction from further stones (5%–33%), because the fistula tract is left intact [24,25] that would typically occur within 6 months [26]. Spontaneous fistula closure rate occurs in 50% despite these risks [14]. The gallbladder must be assessed for the presence of residual stones to avoid re-impaction [18,15].

Traditionally, the one-stage procedure has been reserved for patients with less severe disease or patients who have been adequately optimized preoperatively, have less comorbid conditions and are relatively younger [15,17,14]. This approach can be complicated due to extensive adhesions over the inflamed segment of the biliary tract that requires vigilant surgical dissection [13,26]. Occasionally, the status of gallbladder like gangrenous cholecystitis and presence of gallstones may necessitate cholecystectomy and fistula closure [27]. Primary fistula closure is itself an independent risk factor associated with greater mortality rates and longer duration of postoperative stay [18].

The two-stage procedure is recommended in physically fit patients who suffer from persistent biliary symptoms secondary to residual gallstones or biliary fistula [18,10,13,26].

Conclusions

As mentioned previously, we’ve decided to perform an enterolithotomy alone in the patient described in this case report. The preference to select this procedure was influenced by the intraoperative findings of inflammation and dense adhesions in GB fossa region, that may increase the risks of iatrogenic injuries and increase the operative time.

Knowledge of this rare entity and familiarity of its clinical manifestation and radiological findings can lead to early diagnosis and better outcome in these patients. It can be concluded that the management of gallstone ileus is mainly surgical. The choice of surgical option depends on the preoperative medical status of the patient, the intraoperative findings and the skill set of the operating surgeon.

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Received: 06.11.2019

Revised: 17.11.2019

Accepted: 24.02.2020