Laparoscopic-Assisted Enterolithotomy for Gallstone Ileus

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Abstract Gallstone ileus is a rare complication of cholelithiasis seen usually in elderly population with comorbidities. Most of the cases present as acute intestinal obstruction with the diagnosis being made intraoperatively. There exists controversy regarding appropriate emergency surgical treatment of gallstone ileus as to whether biliary tract surgery should be done during the first operation. Laparoscopy in recent years is also being used for management of such cases. We report a case of gallstone ileus diagnosed preoperatively and successfully treated by laparoscopic-assisted enterolithotomy.

Keywords Gallstone ileus · Cholecystoenteric fistula · Laparoscopy · Enterolithotomy · Intestinal obstruction

Introduction

Gallstone ileus is an unusual complication of cholelithiasis, occurring in less than 0.5 % of patients. It is responsible for approximately 1 to 4 % of all cases of mechanical obstruction and, in patients over age 65, accounts for 25 % of non-strangulated small bowel obstruction [1]. Most patients have associated other medical comorbidities. Overall mortality rates for gallstone ileus are between 4.5 and 25 %, which is five to ten times higher than with all other nonmalignant causes of mechanical small bowel obstructions [1]. Open enterolithotomy with or without biliary tract surgery has been the surgery of choice. With the advent of laparoscopy, many

cases are now being operated laparoscopically with good results [2]. We report a case of gallstone ileus which was treated laparoscopically.

Case Report

A 70-year-old lady presented with complaints of abdominal pain and oliguria since 3 days. There was no history of fever, hematuria, and dysuria. There was past history of hypertension and ureteric stone disease with DJ stenting done 1 year back. On general examination, the patient was severely dehydrated and hemodynamically stable. Abdominal examination revealed distension without any signs of peritonism. Blood investigations revealed Hb—18.5 g/dl, PCV—55 %, WBC—12,390/mm³, BUN—103 mg/dl, serum creatinine—3.5 mg/dl, Na—130 mEq/L, and K—2.6 mEq/L. Liver function tests were normal except for alkaline phosphatase of 176 U/L. Because the patient had abdominal distension, abdominal radiograph was done which revealed few air fluid levels with a foreign body in the right lower quadrant of abdomen. Ultrasonography of the abdomen showed pneumobilia with dilated common bile duct of 9 mm with distended stomach and bowel loops. Gallbladder could not be visualized. Due to suspicion of gallstone ileus with raised serum creatinine, magnetic resonance cholangiopancreatography (MRCP) was done to confirm the diagnosis. It showed pneumobilia, air in gallbladder with cholecystoduodenal fistula with impacted single gallstone of 4 cm in the distal jejunum (Fig. 1).

The patient was resuscitated and nasogastric tube was inserted for decompression. Trial of conservative management was given for 4 days and renal functions were corrected. But patient persisted to have high nasogastric aspirate. Hence, decision to perform a diagnostic laparoscopy was taken. On laparoscopy, the gallbladder could not be visualized and was covered by duodenum and omentum suggestive of

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Fig. 1 Magnetic resonance cholangiopancreatography showed air in the gallbladder with cholecystoduodenal fistula with impacted single gallstone of 4 cm in the distal jejunum

cholecystoduodenal fistula. The proximal small bowel loops were dilated. Bowel tracing was performed from collapsed ileal loops towards duodenojejunal flexure to prevent serosal injuries to dilated edematous proximal loops and an impacted stone was found at the site of transition. Total laparoscopic procedure was avoided due to her comorbidities.

By extending the umbilical port incision, the impacted stone with bowel loops was brought out of the incision and was milked proximal to the site of impaction, and enterolithotomy was performed (Fig. 2). The size of retrieved gallstone was 4×3×2 cm. Postoperative course was uneventful except for superficial wound infection.

Fig. 2 Intraoperative picture demonstrating enterolithotomy

Discussion

Gallstone ileus is a rare complication of gallstone disease. It occurs because of migration of large gallstone in to the intestine through cholecystoenteric fistula. It is most commonly seen in elderly population presenting with features of intestinal obstruction. The classical Rigler's triad of pneumobilia, small bowel obstruction, and an ectopic gallstone are seen in less than 50 % of cases on abdominal X-ray film. A change in the position of a previously observed calcification on repeat films and a change in the level of mechanical intestinal obstruction—the so-called tumbling obstruction—are also characteristics of gallstone ileus, but not common [1]. Rarely, the obstruction is so severe to cause dehydration leading to acute renal failure. This patient had preexisting renal disease which worsened due to dehydration leading to acute renal failure.

Ripolles et al. showed that preoperative diagnosis of gallstone ileus is increased to 74 % by combining plain abdominal radiograph with ultrasound [3]. Computed tomography (CT) scan has widely been accepted as the investigation of choice for the detection of gallstone ileus with sensitivity and specificity of 93 and 100 %, respectively [4]. As the serum creatinine level of this patient was raised, MRCP was done instead of CT.

The surgical procedure of choice for gallstone ileus remains controversial. The one-stage procedure includes enterolithotomy, cholecystectomy, and fistula repair. The two-stage procedure involves initial emergent enterolithotomy followed by cholecystectomy and fistula closure in 4–6 weeks. A third approach is to perform only emergency enterolithotomy without follow-up biliary tract surgery as most of these patients are elderly and at high risk for complex procedures. Till date, there has not been any randomized trial to suggest superiority of one approach over other because of the rarity of this disease. A review of 1,001 cases of gallstone ileus by Reisner et al. showed a mortality rate of 11.7 % for simple enterolithotomy in comparison to 16.9 % for the one-stage procedure [1]. The recurrence rate of gallstone ileus was less than 5 %, and only 10 % of patients required reoperation for continued symptoms related to the biliary tract. Similar results have been found in other published reports [5].

Open enterolithotomy has been the standard of care for years, but there have been several recent reports regarding the use of laparoscopic approach in gallstone ileus.

The possible benefits of laparoscopy in gallstone ileus are as follows:

1. Prevents unnecessary laparotomies in undiagnosed cases [6]
2. Guides in taking surgical incision [6]
3. Shortens hospital stay [2]
4. Reduces morbidity [2, 7]

In this patient, laparoscopy helped to achieve most of the above-discussed benefits.

Moberg et al. compared laparoscopic assisted with open enterolithotomy and found that the laparoscopic group had lesser major complications and shorter hospital stay with comparable operative time [7].

Enterolithotomy can be performed either by laparoscopic-assisted open technique or total laparoscopically [7, 8]. Total laparoscopic enterolithotomy demands skills of intracorporeal laparoscopic suturing. In this patient, because of her comorbidities and edematous proximal bowel loops, total laparoscopic procedure was not done.

Endoscopic lithotripsy is also an attractive therapeutic option for gallstone impacted in the stomach, duodenum, or colon [9, 10]. In most of the reported cases, mechanical, electrohydraulic, or laser lithotripsies have been used to fragment the stone [9–11]. ESWL has also been used at times for stone fragmentation [11, 12]. The stone fragments are either removed endoscopically or they get passed spontaneously in the stools, but it carries the risk of recurrent symptoms or distal obstruction [10]. Endoscopic treatment carries a high failure rate and requires an appropriate patient selection.

Conservative medical treatment is reserved for patients with several comorbidities with obstructing gallstone of less than 2 cm as it is likely to get passed off spontaneously [11].

Conclusion

High grade of clinical suspicion is required for the diagnosis of gallstone ileus. Laparoscopic-assisted enterolithotomy is

a safe and effective technique of management of gallstone ileus with better outcomes than open technique.

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