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Gallstone Ileus: Report Of Three Cases And Review Of Literature

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ORIGINAL

Introduction

Gallstone ileus (GI) is an uncommon sequela of cholelithiasis or gallbladder stones. It accounts for about 0.3-0.5% of incidences of cholelithiasis (1). In the same vein, it is also a rare etiology of intestinal obstruction. Approximately 1-4% of cases of intestinal obstruction are due to GI (2). However, we have encountered a series of cases of GI. Hence the question begs:

Is GI a rare disease as reported in the medical literature or the spate of cases at our center was merely a statistical outlier attributable to external factors?

Gallstone ileus results from a gallstone that causes pressure necrosis between the inflamed gallbladder wall and the adjacent duodenum (or possibly other parts of the gastrointestinal tract which is in proximity) leading to erosion and formation of a cholecysto-enteric fistula. It is through this fistulous track that the stone migrates and ends up in the bowels causing obstruction (3). Nonetheless, the term “gallstone ileus” is a misnomer as it causes a mechanical bowel obstruction unlike in the true technical sense of the word “ileus” which pertains to functional paralysis of the bowels.

All 3 cases reported here occurred while we were in the thick of the COVID pandemic. During this particular period, many medical services were affected due to various reasons, a few among them were numerous physical lockdowns, closure of operating theatres, lack of medical staffing, and defaulting of doctors’ appointments by patients.

We would like to present a series of 3 cases of GI encountered at our practice.

Case Report

Case 1:

A 61 years old lady came to the Emergency Department with complaints of right-sided abdominal pain for 4 days. It was associated with abdominal distension and symptoms of intestinal obstruction (no bowel output and bilious vomiting) for the past 2 days.

She has a prior admission for acute cholecystitis for which she was treated conservatively with antibiotics and subsequently discharged well with an appointment for laparoscopic cholecystectomy in 6 weeks. An ultrasound scan revealed a gallstone at the neck of the gallbladder measuring 2.6cm, apart from features of acute cholecystitis.

An abdominal x-ray done during the episode of intestinal obstruction showed small bowel dilatation with a well-rounded opacity measuring 3.6cm in the right iliac fossa. With the suspicion of GI, we proceeded with a CT abdomen which confirmed our provisional diagnosis. The scan revealed a calculus within the small bowel lumen at the right lower abdominal region causing

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proximal small bowel dilatation. A possible cholecysto-duodenal fistula was seen between the gallbladder and the second part of the duodenum as evidenced by the presence of air bubbles.

She underwent a laparotomy, enterolithotomy, and Heineke-Mikulicz enteroplasty. There was a stone measuring 3 x 4 cm impacted at the distal ileum, 30cm from the terminal ileum with dilated small bowels proximally. The gallbladder was covered with omentum forming an inflammatory mass. Post-operatively was uneventful and she was able to be discharged home 4 days after the operation.

Figure 1. A laminated calculus within the ileum causing small bowel obstruction

Case 2:

A 66 years old gentleman presented with pain over the epigastrium and no bowel output and vomiting for 2 days.

He has a surgical history of laparoscopic left adrenalectomy for Conn's adenoma of the left adrenal. An interesting point to note is that he also had previous outpatient visits to the surgical outpatient department for biliary colic. An ultrasound done during one of the visits confirmed the presence of cholelithiasis.

An abdominal x-ray showed the typical "stack of coins" appearance suggestive of dilated small bowels. Given his previous surgical history, he was treated conservatively for adhesive small bowel obstruction. A repeated x-ray the next day showed similar findings. Hence a decision was made to proceed with a CT abdomen which revealed a lamellated hyperdensity 1.9cm in size about 20cm from the ileocaecal junction with dilated proximal jejunum and ileum, in keeping with impacted gallstone. A 0.9cm stone was visualized in the distal common bile duct (CBD) with dilatation of the proximal CBD of 1.2cm. Also, there were air locules and contrast within the gallbladder with the poor intervening fat plane with the first part of the duodenum, suspicious of cholecysto-duodenal fistula.

Upon exploratory laparotomy, there was a transition point 22 cm from the ICV with a gallstone measuring 3 cm. there was dense adhesion of the omentum to the gall bladder, Enterolithotomy, and Heineke-Mikulicz enteroplasty were done.

During the same admission, he was sent to a hepatobiliary center for endoscopic retrograde cholangio-pancreaticography (ERCP) and stenting of the common bile duct for choledocholithiasis. He was subsequently discharged home with an appointment for an interval cholecystectomy later.

Figure 2. Coronal view of CT abdomen before administration of contrast showing pneumobilia, gallstone in the right lower abdomen region, and dilated small bowels

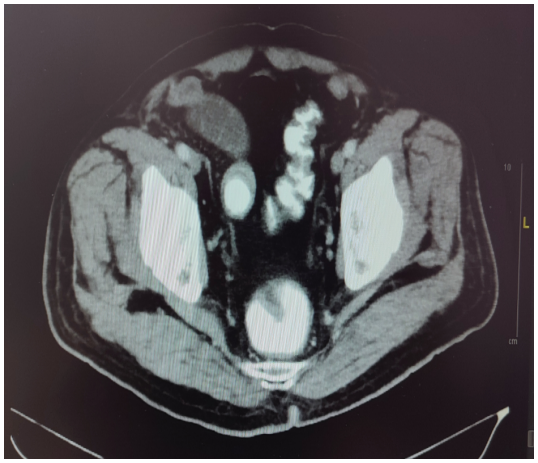

Figure 3. Coronal view of CT abdomen before administration of contrast showing pneumobilia, gallstone in the right lower abdomen region, and dilated small bowels

Case 3:

An 83 years old lady complained of upper and central abdominal pain for 4 days. She had no bowel output for the past 4 days but was able to pass flatus. Upon further history taking, she claimed to be having intermittent upper abdominal pain for the past 6 months, worsening upon food intake but resolved with over-the-counter paracetamol.

An abdominal x-ray showed small bowel dilatation. CT abdomen demonstrated a transition point at the distal jejunum with a lamellated calculus measuring 2.5 cm. There was also a fistulous communication between the gallbladder and the second part of the duodenum.

She underwent a laparotomy and enterolithotomy. Intraoperatively there was a 2.5 cm stone at 100cm from the duodenojejunal junction causing small bowel obstruction.

Post-operatively she developed pulmonary atelectasis but was able to be discharged on the ninth-day post-operation.

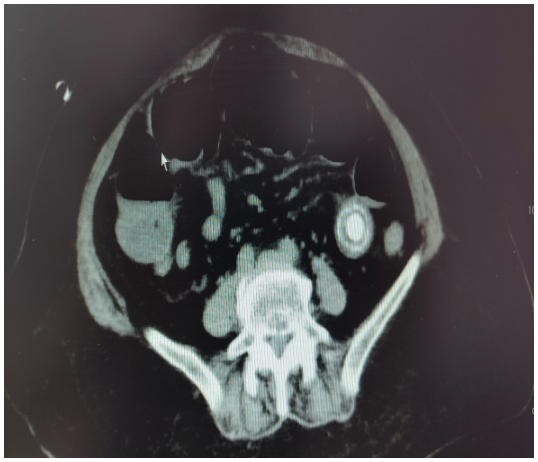

Figure 4. Coronal view of CT abdomen before administration of contrast showing pneumobilia, gallstone in the right lower abdomen region, and dilated small bowels

Figure 5. Coronal view of CT abdomen before administration of contrast showing pneumobilia, gallstone in the right lower abdomen region, and dilated small bowels

Discussion

Disease rarity and burden of disease

Most studies have demonstrated GI to be a rare complication of gallstone disease or a rare cause of intestinal obstruction. In plain terms, it is a rare disease. In the technical sense of the term "rare disease", how rare is "rare"? According to Trevor (4), there is currently no universal definition of a rare disease. This systematic review indicated that the heterogenicity in the meaning of this particular terminology of "rare disease" may include its prevalence in population or disease severity or lack of existing treatment. Despite this, the globally accepted average prevalence threshold is about 40 cases per 100, 000 people.

With regards to GI, it occurs in 0.5% of patients with cholelithiasis (1; 5). 10-15% of the adult population in the United States (US) is estimated to have gallstones (6). Assuming that the population in the US is representative of the global population, the prevalence of GI mathematically translates to about 0.5- 0.75 cases per 100, 00 people. Local or regional studies are deficient concerning the incidence or prevalence of gallstone diseases.

Diagnosis

The diagnosis of GI is difficult and often delayed due to non-specific signs and symptoms (7). The diagnosis is usually made 3-8 days after the onset of symptoms (8). As demonstrated by case no.2, a laparotomy was undertaken on day 2 of admission after failed conservative management of intestinal obstruction. Therefore, a high index of suspicion is required to come to an accurate diagnosis.

Case no. 1 and no. 2 have a medical history of cholelithiasis while the third case had symptoms of biliary colic in retrospect. Case no.1 defaulted her appointment for an interval cholecystectomy after her episode of acute cholecystitis citing the COVID pandemic as the reason (she was apprehensive of going to the hospital for fear of contracting the COVID virus).

The other 2 patients did complain of intermittent abdominal pain for a few months before the onset of intestinal obstruction but did not seek medical attention. We could only speculate that it was either due to the natural progression of the disease wherein the gallstones caused episodic symptoms termed the “tumbling phenomenon” or the COVID pandemic which led to misgivings on the patients’ part to seek medical attention.

(9)The “tumbling phenomenon” due to the gallstones rolling in the bowels causing intermittent symptoms of pain and obstruction before it gets lodged and gives rise to more severe symptoms.

Treatment

Management of gallstone ileus is the treatment of the intestinal obstruction followed by remedy of the aetiology of the obstruction (gallbladder stones and cholecysto-enteric fistula). (10)Opinion is divided on whether to embark on a single or a two-stage surgery. A 2004 study conducted by (11) found no significant difference in mortality and morbidity of patients who underwent a single or two-stage surgery.

The classical method for remedy of intestinal obstruction is laparotomy. However, nowadays there is a shift toward laparoscopic treatment, especially among experienced surgeons (12). The laparoscopic approach entails an enterolithotomy and intracorporeal suturing of the enterotomy site. It contributes to lower morbidity rates and less post-operative pain leading to a quicker recovery (13). A laparotomy was done in all 3 of our cases as these cases were operated on during the height of the COVID pandemic when there were local guidelines in place to discourage laparoscopic procedures to prevent the generation of aerosols. Successful endoscopic stone retrieval has been described for gallstones impacted in the colon (14). This non-surgical method is less invasive but requires the operator to be technically adept at endoscopy.

Prevention

Because of the current volatility of COVID conditions and its impact on elective surgical services, index cholecystectomy following admission for acute gallstone disease can be considered to reduce the incidence of complications and henceforth, reduce the burden on medical services. An audit in New Zealand by (14) demonstrated a reduction in total monthly bed-days of patients with acute gallbladder-related pathology, attributed to the introduction of index cholecystectomy.

Conclusion

Without a doubt, the COVID pandemic is a medical phenomenon that has affected the global population. However strong the circumstantial evidence may be, it remains to be justified whether the fallout from this pandemic also includes delayed treatment for gallstone disease leading to the prevalence of a rare disease. It would be prudent to commission further studies or audits to assess the full impact of the COVID outbreak on the healthcare system.

With an increasing occurrence of gallstone ileus and the waning of the COVID pandemic, perhaps our center could look towards the introduction of the laparoscopic method for the benefit of the patients. In summary, GI though rare should be considered a differential diagnosis when encountering elderly patients with mechanical bowel obstruction, especially in those who have a history of cholelithiasis.

Conflict Of Interest

All authors declare no conflict of interest of any kind.

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