The Surgical Patient

An uncommon cause of mechanical small bowel obstruction

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CASE

Our patient is an active and healthy 71-year-old white male who presented to his primary physician after a 1-week history of postprandial nausea with emesis. He recalled that 12 months earlier, similar symptoms occurred and resolved without intervention. His symptoms occurred twice a day approximately 10 minutes after eating and were associated with hiccups. He denied abdominal pain, bloating, diarrhea, hematemesis, hematochezia, or melena.

His primary physician started him on metoclopramide, 10 mg, 30 minutes before meals and instructed him to follow up if his symptoms did not improve. There was no change in his symptoms, which prompted an emergency department (ED) visit the next day.

The patient's vital signs in the ED were temperature, 37.3°C; heart rate, 80 beats per minute; respirations, 16 breaths per minute; and BP, 154/92 mm Hg. Results of laboratory studies revealed a CBC with a left shift; WBC count, 8.6 × 10⁹/L; and neutrophils and monocytes, 71% and 17%, respectively. Comprehensive metabolic panel findings and urinalysis were within normal limits.

A two-view abdominal plain radiograph revealed several dilated loops of small bowel with two dynamic air-fluid levels, a moderate amount of stool in the ascending colon, and gas in the descending colon (Figure 1). No free air was present. CT of the abdomen and pelvis showed a mechanical small bowel obstruction (SBO) related to an area of narrowing in the distal jejunum at the ileal junction. Also noted on CT was a minimal right basilar atelectasis and cholelithiasis with an indistinct gallbladder wall, which raised suspicion of an associated acute cholecystitis (Figure 2). The patient was admitted to the hospital for hydration and further evaluation. A nasogastric tube was placed for gastric decompression, he was to receive nothing by mouth, and general surgery was consulted concerning the SBO.

The patient's medical history was significant for 1 year of untreated hypertension. He denied any other medical history and was not currently taking any medications. Surgical history revealed no prior procedures. He did admit to a 50 to 60 pack/year smoking history but had been abstinent for the past 30 years. He denied current alcohol use but admitted to prior heavy alcohol consumption. Colonoscopy findings within the past 2 years were negative. The only positive in his family history was venous thromboembolism with pulmonary emboli.

Treatment consisted of nasogastric decompression, IV hydration, daily monitoring via laboratory studies, abdominal plain radiography, and bowel rest; however, 3 days later, the patient's symptoms had not improved, and he was taken to the operating room for an exploratory laparotomy. A limited midline incision was made and the abdomen entered. Several FIGURE 1. Dilated loops of small bowel and multiple air fluid levels are seen on plain film radiography. Note the stool in the ascending colon and gas in the descending colon.
Intestinal obstructions are classified into two general categories. An ileus is the result of a disturbance in normal gut motility, such as an intra-abdominal surgical procedure; a neurologic disorder; or a side effect of medication, most commonly narcotics. A mechanical obstruction is a blockage in the intestinal lumen. An SBO typically results from a postoperative intra-abdominal adhesion, a hernia, or a neoplasm. Gallstone ileus is an unusual cause of intestinal obstruction, accounting for about 1% to 4% of all cases.1,2 The incidence of gallstone ileus increases with advancing age and accounts for more than 25% of nonstrangulated bowel obstructions in patients older than 65 years.3,4 More than half of patients with gallstone ileus will have a history of gallbladder disease.1 First described by Courvoisier in 1890, gallstone ileus has remained a difficult diagnostic entity.3

The phrase gallstone ileus does not accurately describe the condition, as it is more precisely an SBO resulting from a gallstone or gallstones within the lumen of the alimentary tract. The gallstone usually enters the bowel via a cholecystenteric fistula resulting from inflammation and adhesions between the biliary and enteric systems following cholecystitis.1 After entering the intestinal lumen, gallstones can migrate proximally toward the stomach and duodenal bulb or distally into the small intestine.3 The intraluminal gallstone may remain asymptomatic for a period of time, producing paroxysms of obstructive symptoms as it tumbles through the bowel, lodging in the lumen then dislodging and continuing its course. Gallstones reportedly are passed spontaneously 80% of the time.

Obstruction most often occurs when gallstones are larger than 2.5 cm in diameter.3 Common sites of obstruction are the ileum (60.5%), the jejunum (16.1%), the stomach (14.2%), the colon (4.1%), and the duodenum (3.5%); however, 1.3% of gallstones larger than 2.5 cm are passed spontaneously.3,5 After the gallstone lodges in the intestine, characteristically in the terminal ileum as this is the narrowest portion,1,3 the symptoms of an SBO no longer wax and wane; they intensify. Classic SBO symptoms include abdominal distention, nausea with emesis, cramping midabdominal pain, and obstipation. These symptoms typically increase during the course of the obstruction. An examination reveals a distended and diffusely tender abdomen with high-pitched, distant bowel sounds. Abdominal pain and vomiting are constant but nonspecific features of gallstone ileus; only 50% to 70% of patients present with clear features of intestinal obstruction.7

Plain abdominal radiography remains the basic tool of diagnosis and will often show a nonspecific obstructive pattern.6 Rigler and colleagues described four radiographic signs of gallstone ileus in 1941.7 Air or contrast medium in the biliary tree, direct or indirect (using contrast) visualization of the stone in the intestine, a change in position of a previously observed stone, and radiographic evidence of partial or complete intestinal obstruction are pathognomonic features of gallstone ileus seen on radiographs.7 Unfortunately, the criteria defined by Rigler’s team are not universal; however, their absence does not exclude gallstone ileus.7 Only about 10% of gallstones are sufficiently calcified to be visualized on radiographs.1

Ultrasoundography is a useful diagnostic tool in some cases of gallstone ileus. Gallstones, pneumobilia, and the presence of a cholecystenteric fistula may be demonstrated.7 CT has largely supplanted the use of plain radiography for obtaining a diagnosis, given its increased sensitivity and specificity for detection.8 Despite the availability of numerous detection modalities, gallstone ileus continues to remain a difficult diagnostic entity. In a retrospective study by Reisner and Cohen, a correct diagnosis was made and confirmed at laparotomy in only 43% of 1,001 cases.9

Treatment for a gallstone that has caused a mechanical intraluminal obstruction is to remove the obstruction via an enterolithotomy and to correct subsequent fluid and electrolyte abnormalities. However, the low incidence of gallstone ileus, coupled with nonspecific findings on examination and radiographic studies, results in delayed diagnosis and prolonged surgical intervention in most cases.

There are two schools of thought on how to remove the obstruction. Classic teachings recommend that the goal in the
emergent setting and in elderly patients is to treat only the emergent condition, namely the bowel obstruction. If symptomatic, the gallbladder can be removed on a semi-elective basis at a later time. This approach has been coined the two-stage procedure. Most cholecystenteric fistulae close spontaneously, and the rate of recurrence for gallstone ileus is only 4.7%.³

The one-stage procedure is somewhat more controversial and has a slightly, though not significantly, higher mortality rate. This method accomplishes enterolithotomy, a cholecystenteric fistula repair, and cholecystectomy in one surgical procedure. The reason for favoring a one-stage procedure is to prevent future complications from the retained gallbladder, such as recurrence of gallstone ileus, cholecystitis, or cholangitis and a higher incidence of gallbladder carcinoma.⁴,⁶

Enterolithotomy alone is the appropriate initial treatment, given the emergent nature of the procedure, the advanced age of many patients, and the frequent occurrence of a complex right upper-quadrant mass containing the cholecystenteric fistula.¹ Furthermore, extensive dissection in the right upper quadrant in the face of active inflammation has its attendant morbidity and increased operative time.³

Studies have shown that complications occur in 61.1% to 66.7% of patients who undergo the one-stage procedure; therefore, suggestions are to reserve the one-stage procedure for select patients who have absolute indications of obstruction.⁸ Factors to consider before deciding on which procedure to perform include comorbid conditions, the current condition of the patient, and the amount of dissection required to excise the fistulous tract. In patients at low risk for these factors, a one-stage procedure may be considered.⁹

Relief of the obstruction via enterolithotomy is essential and may be performed during laparotomy or laparoscopy.⁷ The role of laparoscopy in the management of gallstone ileus is still emerging.⁹ An advantage of laparoscopy is its diagnostic potential in a patient already scheduled to undergo surgery. It is then possible to proceed with a laparoscopic operation or to optimize the position of the incision for an open procedure with the aim of minimizing the trauma.⁸ One thing to consider is that a laparoscopic approach could add another degree of difficulty when faced with an intraluminal obstruction and distended loops of bowel. The search for additional points of obstruction and evaluation of the rest of the small bowel will be quite difficult.

Morbidity is thought to be predictive of recurrent disease if the stones are cylindric or faceted. The importance of this observation is that these shapes imply multiplicity of stones, which should alert the surgeon to the possibility of additional stones remaining in the intestine.⁸ The most common source of morbidity after treatment for gallstone intestinal obstruction is wound infection, which occurs in 32% of patients.⁶ Morbidity associated with the biliary tract (15%) includes cholecystitis, cholangitis, and recurrent gallstone ileus.⁶

Gallstone ileus often results in delayed diagnosis and prolonged surgical intervention. Better awareness of this condition allows for a greater diagnostic accuracy and earlier therapy. Preoperative delay and unnecessary surgery in patients who would otherwise pass the stone spontaneously would be avoided, as well.⁸

OUTCOME

Our patient had significant inflammatory phlegmon in the right upper quadrant consistent with the location of a suspected cholecystenteric fistula. Secondary to a review of the literature and prior clinical studies, we decided to use the two-stage approach for our patient. The gallbladder and cholecystenteric fistula were left intact at the initial procedure, with removal pending resolution of the surrounding inflammation. Recurrent gallstone ileus occurs in 5% of patients, with 57% of recurrences within 6 months of the initial procedure.⁵ This patient is now more than 6 months out from the initial surgery, and he has had an asymptomatic course. The fistula has closed off, and the patient is without recurring symptoms; however, follow-up is still ongoing. JAAPA

Joel Hill works in the Department of Surgery, Rapid City Medical Center, Rapid City, South Dakota. He has indicated no relationships to disclose relating to the content of this article.

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REFERENCES
