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## **Choledocholithiasis during staged surgical management of gallstone ileus: case report**

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## **Abstract**

Small bowel obstructions are uncommonly due to gallstone ileus. This occurs due to sequelae of cholecystitis in which a cholecystointestinal fistula forms. Gallstones that pass through the fistula can form a mechanical bowel obstruction. Although this entity has been described previously, the complications of surgical management of these patients are less frequently encountered in the literature. This case report highlights one such complication.

## **Introduction**

Small bowel obstructions are uncommonly due to gallstone ileus. This occurs due to sequelae of cholecystitis in which a cholecystointestinal fistula forms. Gallstones that pass through the fistula can form a mechanical bowel obstruction. Although this entity has been described previously, the complications of surgical management of these patients are less frequently encountered in the literature.<sup>1-3</sup> This case report highlights one such complication.

## **Case Report**

The patient is an 80-year-old female with a medical history of coronary artery disease, ischemic dilated cardiomyopathy, and coronary artery bypass grafting. She presented to the Emergency

Department (ED) complaining of abdominal pain and nausea. The pain was described as cramping, severe, and localized around her umbilicus. She denied fevers, diarrhea, and dysuria.

Her vital signs included blood pressure at 149/64 mmHg, temperature of 37.3°C, pulse of 92 beats per minute, respiratory rate of 18 breaths per minute, and oxygen saturation of 98% on room air. She had diffused abdominal tenderness, particularly in the epigastric and periumbilical areas. She was otherwise not toxic appearing.

Her laboratory evaluation showed leukocytosis of 20.6 Thou/uL, while hemoglobin, platelets, renal function, liver function testing, total bilirubin, and lipase were normal. Imaging with Computed Tomography (CT) of the abdomen and pelvis showed findings consistent with a moderate mechanical small bowel obstruction secondary to an intraluminal gallstone in the right lower quadrant at the top of the iliac crest (Figure 1). Air was noted within the lumen of the gallbladder along with pneumobilia, consistent with a fistula to the duodenum.

Surgical consultation took place, and the patient underwent an enterotomy with extraction of a golf ball-sized gallstone lodged in the mid ileum with proximal bowel dilation. Due to inflammation and risk of common bile duct injury, cholecystectomy was planned in 4 weeks. She did well post-operatively and was discharged home. Two days after being discharged, the patient had a return visit to the ED with worsening abdominal pain and distension. A repeat CT of the abdomen showed an 8mm common bile duct stone near the sphincter of Oddi. She underwent endoscopic retrograde cholangiopancreatography, had papillary stenosis status post sphincterotomy, common bile duct stone extraction, and stent placement. A 3 mm opening at the duodenal bulb was visualized with draining bile consistent with a cholecystoduodenal fistula.

## **Discussion**

Gallstone ileus is a rare complication of cholelithiasis. Management of gallstone ileus is challenging given the frequent frailty and numerous comorbidities in such patients. This case shows images of the patient's pathology from CT evaluation.<sup>1,2</sup>

The pathogenesis of gallstone ileus involves sequelae of cholecystitis in which a cholecystointestinal fistula forms. Gallstones that pass through the fistula can form a mechanical bowel obstruction. A cholecystoduodenal fistula forms in most cases; however, cholecystogastric, cholecystojejunal, cholecystoileal, and cholecystocolonic fistulas have been reported. Passage of the gallstone through the common bile duct, into the gastrointestinal tract, and culminating in a bowel obstruction is extremely rare. This is typically associated with patients at risk of developing gastrointestinal strictures, such as those with Crohn's disease.<sup>3,4</sup>

Mirizzi syndrome and gallstone ileus are frequently coexistent as they represent different pathologies of the same disease process. Mirizzi syndrome is extrinsic compression of the common bile duct due to impacted gallstones in the gallbladder infundibulum or the cystic duct. Impacted gallstones then lead to ischemia and necrosis of the gallbladder wall, which can result in fistula formation with nearby structures.<sup>5-7</sup>

The clinical evaluation typically involves signs and symptoms of a bowel obstruction. A high-grade obstruction may be noted; however, various stages of a bowel obstruction may be encountered depending on the chronicity of symptoms. Abdominal distension, nausea, vomiting, and obstipation may be noted. Physical exam findings will not provide specificity for the diagnosis of gallstone ileus. However, the Mordor triad (history of known gallstones, clinical signs of cholecystitis, and onset of bowel obstruction) may be noted and should point to gastrointestinal pathology, rather than adhesion or incarcerated hernia, causing the patient's symptoms.<sup>8,9</sup>

Diagnostic testing in the form of cross-sectional imaging is most sensitive and specific for gallstone ileus. Ultrasonography may be considered if CT imaging is not available as it may also reveal the exact location of the obstructing gallstone. X-ray will be nonspecific and may only show signs of a small bowel obstruction without revealing the underlying cause.<sup>10-12</sup> Laboratory testing of liver enzymes and bilirubin concentration is often not revealing. Contrast-enhanced CT has high sensitivity and specificity at 93% and 100% respectively.<sup>13</sup>

Treating gallstone ileus requires surgical management. A two-stage approach is common; however, in selected patients, a one-stage procedure may be considered. The persistence of a cholecystointestinal fistula, as the two-stage approach involves first stone extraction followed later by fistula closure, portends a risk of retrograde cholecystitis, gallbladder cancer, and recurrent gallstone ileus. However, A study in 1994 showed higher mortality in the one-stage approach given the higher degree of invasiveness. Patients' pre-surgical morbidity is important in surgical decision-making.<sup>14</sup>

## **Conclusions**

Gallstone ileus is an uncommon cause of bowel obstruction. CT imaging frequently yields impressive images as demonstrated in this case. Emergency providers need to consider this diagnosis when patients present with signs and symptoms of cholelithiasis and bowel obstruction. Furthermore, when the two-stage surgical management approach is taken, complications of recurrent cholecystitis, biliary cancer, and recurrent complications related to gallbladder calculi should be anticipated.

## References

1. Halabi WJ, Kang CY, Ketana N, et al. Surgery for gallstone ileus: a nationwide comparison of trends and outcomes. *Ann Surg* 2014;259:329-35.
2. Abou-Saif A, Al-Kawas FH. Complications of gallstone disease: Mirizzi syndrome, cholecystocholedochal fistula, and gallstone ileus. *Am J Gastroenterol* 2002;97:249-54.
3. Clavien PA, Richon J, Burgan S, et al. Gallstone ileus. *Br J Surg* 1990;77:737-42.
4. Reisner RM, Cohen JR. Gallstone ileus: a review of 1001 reported cases. *Am Surg* 1994;60:441-6.
5. Beltran MA, Csendes A. Mirizzi syndrome and gallstone ileus: an unusual presentation of gallstone disease. *J Gastrointest Surg* 2005;9:686-9.
6. Csendes A, Díaz JC, Burdiles P, et al. Mirizzi syndrome and cholecystobiliary fistula: a unifying classification. *Br J Surg* 1989;76:1139-43.
7. Yip AW, Chow WC, Chan J, Lam KH. Mirizzi syndrome with cholecystocholedochal fistula: preoperative diagnosis and management. *Surgery* 1992;111:335-8.
8. Beuran M, Ivanov I, Venter MD. Gallstone ileus-clinical and therapeutic aspects. *J Med Life* 2010;3:365-71.
9. Beuran M, Venter MD, Ivanov I, et al. Iftimie-Nastase I and Venter DP. Gallstone ileus --- Still a problem with heart. *Ann Acad Rom Sci Ser Med Sci* 2012;3:5-28.
10. Lasson A, Lorén I, Nilsson A, et al. Ultrasonography in gallstone ileus: a diagnostic challenge. *Eur J Surg* 1995;161:259.
11. Chang L, Chang M, Chang HM, et al. Clinical and radiological diagnosis of gallstone ileus: a mini review. *Emerg Radiol* 2018;25:189-96.

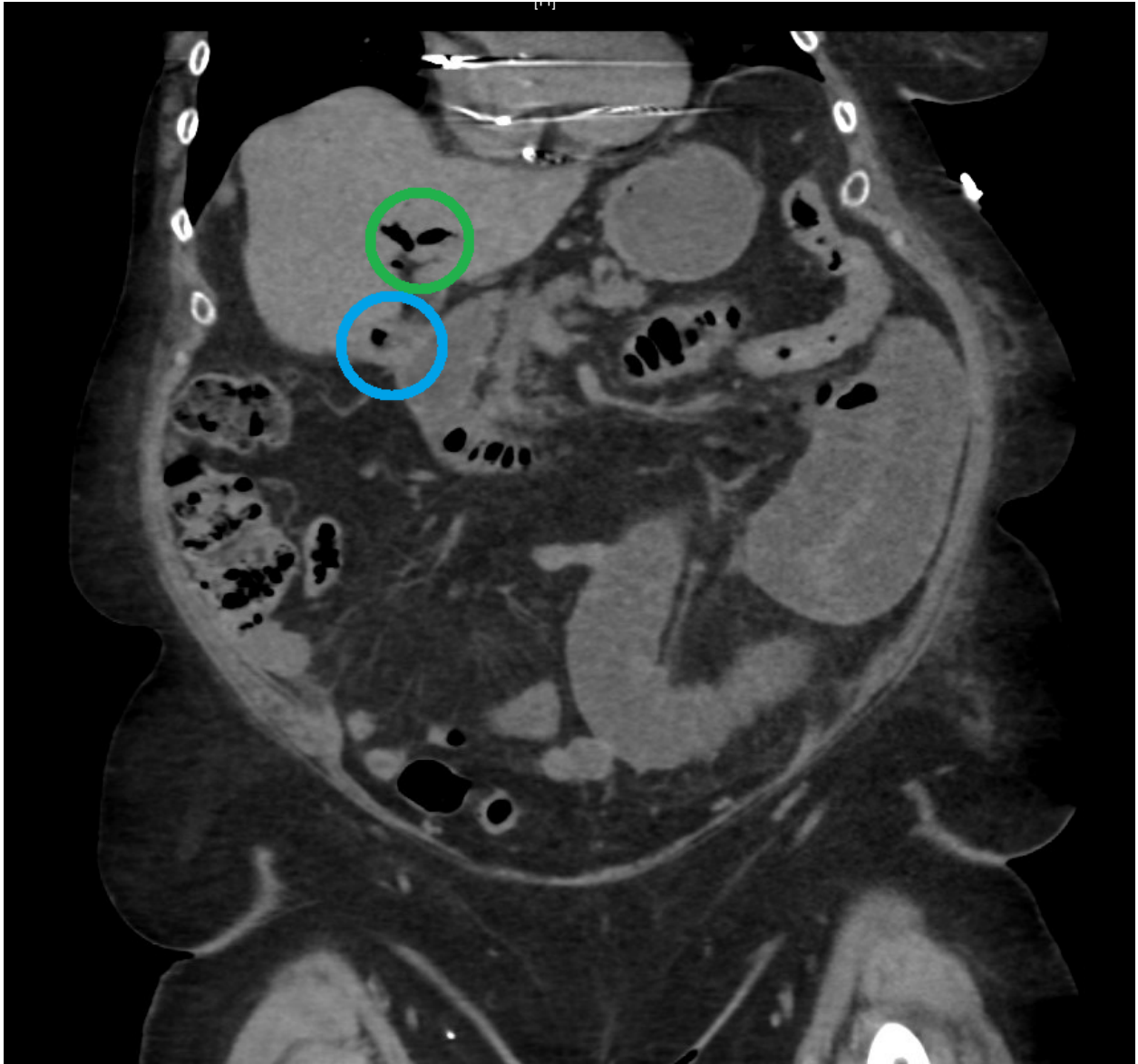
12. Senra C, Pinto J, Queirós T, Coelho P. Gallstone ileus: a challenging ultrasound diagnosis. 2020. Available from: <https://www.eurorad.org/case/16843>
13. Yu C-Y, Lin C-C, Shyu R-Y, et al. Value of CT in the diagnosis and management of gallstone ileus. *World J Gastroenterol* 2005;11:2142-7.
14. Reisner RM, Cohen JR. Gallstone ileus: a review of 1001 reported cases. *Am Surg* 1994;60:441-6.



a)



b)



**Figure 1. a)** Computed Tomography (CT) image depicting findings of mildly dilated loops of small bowel and an intraluminal gallstone (blue circle); **b)** Separate coronal image showing a contracted gallbladder with luminal air (blue circle) and pneumobilia (green circle).

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