Cerrahpaşa Med J 2022; 46(1): 80-82 CASE REPORT

A Rare Cause of Ileus: Gallstone Ileus

Emre Tunç, Sefa Ergün, Osman Şimşek, Salih Pekmezci

Department of General Surgery, İstanbul University-Cerrahpaşa, Cerrahpaşa School of Medicine, İstanbul, Turkey

Cite this article as: Tunç E, Şimşek S, Pekmezci S. A rare cause of ileus: Gallstone ileus. *Cerrahpaşa Med J.* 2022;46(1):80-82.

Abstract

Gallstone ileus is a rare complication of cholelithiasis. It usually develops when stones in the gallbladder or biliary tract are fistulized into the gastrointestinal tract. Gallstone ileus is more common in women, and its incidence increases with age. The clinical symptoms and signs of gallstone ileus vary according to the place where the stone obstructs. Signs of intestinal obstruction such as nausea, vomiting, constipation, obstipation, aperistalsis, and abdominal distension are common. Contrast-enhanced computed tomography is the gold standard imaging method in the diagnosis. The treatment algorithm of gallstone ileus is controversial. In general, there are publications recommending simple enterotomy, one-stage surgery, and two-stage surgery. Patient's age and comorbidities, fluid electrolyte imbalance, and segment of obstruction are considered for determining operative management. In our case, the diagnosis and treatment algorithm of the patient who applied to the Cerrahpaşa School of Medicine Emergency Clinic with ileus findings and was found to have gallstone ileus as a result of the examinations are presented.

Keywords: Emergency surgery, gallstone ileus, laparoscopy

Gallstone ileus (GI) is a rare complication of cholelithiasis with a rate of 0.15% to 1.5%. Gallstone ileus, which accounts for less than 0.1% of all ileus cases, usually develops when stones in the gallbladder or biliary tract are fistulized into the gastrointestinal tract. Gallstone ileus is 3.5 times more common in women, and its incidence increases with age.[1] The average age of onset is between 65 and 75 years.[2] The patient's long-term history of cholelithiasis and recurrent episodes of acute cholecystitis are other factors affecting the occurrence of GI.

The clinical symptoms and signs of GI vary according to the place where the stone obstructs. In Bouveret syndrome, attacks of nausea and vomiting develop as a result of gallstone blocking the gastric outlet in the duodenum. In Barnard's syndrome, signs of intestinal obstruction such as nausea, vomiting, constipation, obstipation, aperistalsis, and abdominal distension due to obstruction in the ileocecal valve are observed, as well as jaundice at a rate of 15%. Chronic abdominal pain due to gallstone passage is seen in Karewsky syndrome. The Mordor triad is defined by the presence of a history of cholelithiasis, acute cholecystitis, and intestinal obstruction.

The diagnosis of the disease begins with the suspicion of GI in patients presenting with ileus symptoms at an advanced age. Although laboratory tests are nonspecific, jaundice and/or liver enzyme elevation are observed in 1/3 of the patients.[3] Abdominal x-ray (AXR) is used as the first-line imaging method in GI. Pneumobilia, ectopic radiopaque stone, and small bowel obstruction known as GI pathognomonic AXR findings are known as Rigler's Triad and are seen in less than 50% of patients.[4] Contrast-enhanced computed tomography (CT) is the gold standard imaging method in the diagnosis of GI with a sensitivity of 90-93% and a specificity of 100%. In addition to the diagnosis of GI with CT, the segment where the stone creates obstruction is determined and thus the treatment is directed. Abdominal ultrasonography (US) is not frequently used in cases of acute ileus because of distention and gas shadows caused by obstruction.[2] Although magnetic resonance cholangiopancreatography (MRCP), which is the gold standard for imaging the bile ducts, is not used in acute ileus conditions, it plays an important role in determining the possible fistula causing GI after ileus treatment.

There are discussions about the treatment algorithm of GI. When the literature is examined, it is seen that there are several different approaches for stone extraction and repair and timing of biliaryenteric fistula.[1]

In our case, the diagnosis and treatment algorithm of the patient who applied to the Cerrahpaşa School of Medicine Emergency Clinic with ileus findings and was found to have GI as a result of the tests are presented.

Case Presentation

A 61-year-old male patient presented to the emergency department with complaints of nausea, vomiting, bloating, intermittent abdominal pain for 5 days, and inability to pass gas and stool for 3 days. Except for benign prostatic hypertrophy, the patient had no history of disease or drug use. In the general evaluation of the patient, it was observed that his vital signs were within normal limits, his general condition was good, he was conscious, oriented, and cooperative. In the abdominal examination, it was observed that the bowel sounds decreased, the patient had distension and diffuse tenderness in the abdomen. Laboratory examinations of the patient showed minimal leukocytosis and moderate C-Reactive Protein (CRP) elevation. Although small bowel type air-fluid levels were observed in the AXR of the patient, pneumobilia and radiopaque gallstones were not observed.

Contrast-enhanced abdominal CT of the patient revealed a gallstone of approximately 3 cm at the level of the middle ileal segment and dilatation of 4 cm in the widest part of the small bowel loops proximal to the stone (Figure 1). The patient underwent laparoscopic exploration, and due to enclaved stone in the terminal ileum, mini laparotomy was made and hand-assisted stone extraction was performed (Figure 2). The patient, who had no problems in the service follow-ups, was discharged 5 days after the operation.

Received: June 25, 2021 **Accepted:** September 16, 2021 **Available Online Date:** November 7, 2021
Corresponding author: Emre Tunç, Department of General Surgery, İstanbul University-Cerrahpaşa, Cerrahpaşa School of Medicine, İstanbul, Turkey
e-mail: emretunc@istanbul.edu.tr
DOI: 10.5152/cjm.2021.21066

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Figure 1. Gallstone (arrow) abdomen CT axial plane. CT, computed tomography.

Figure 2. Gallstone extraction with mini laparotomy incision.

Discussion

In most of the cases, GI occurs as a result of stones in the gallbladder or biliary tract, causing chronic inflammation and ischemia, fistulizing the gastrointestinal tract and obstructing the lumen.[5,6] Although this fistulization is mostly in the form of cholecystoduodenal fistula in the duodenum at a rate of 60-83%, it may rarely occur in the stomach, transverse colon, and distal small intestine.[1,3] It has been shown that large gallstones scattered into the abdomen after laparoscopic cholecystectomy also cause GI by fistulizing into the gastrointestinal tract with the abscess formation afterward. More rarely, it has been observed that gallstones passing through the dilated papilla of Vater after sphincterotomy cause GI.[3] It has been observed that the size of the gallstones is also important in the formation of GI, the size of the gallstones forming GI is usually 2-2.5 cm above, and smaller stones pass through the digestive tract without forming ileus.[7-9] It is known that 20% of the gallstones that pass into the gastrointestinal tract form ileus, and the majority of them are excreted without causing obstruction. It causes obstruction in the ileum, which has the narrowest lumen of 60%, in the jejunum with 16%, in the stomach with 15%, and in the colon with 2-8%.[10] Less frequently, occlusion has been shown to occur in stricture areas, stenotic segments, tumoral strictures, and neck of Meckel's diverticulum due to inflammatory bowel diseases.[1]

Although GI is a rare condition, it is a serious health problem with a mortality rate of up to 30% and a morbidity rate of up to 50%, since it is usually seen in elderly patients with many comorbid diseases. The advanced age and comorbidities of patients with GI reveal the importance of early diagnosis and treatment of the disease. After diagnosis, effective decompression, correction of fluid electrolyte imbalance and metabolic status of patients play an important role in reducing postoperative mortality and morbidity. When the literature is examined, it is noticed that the treatment of gallstone ileus is controversial. Although the main step of operative treatment is the resolution of ileus with enterotomy and gallstone extraction, a good judgment to determine the method of operative treatment in patients with comorbidities is required. In general, there are publications recommending simple enterotomy, one-stage surgery, and two-stage surgery. Patient's age and comorbidities, fluid electrolyte imbalance, and segment of obstruction are considered for determining operative managment.[11]

The probability of the gallstone causing GI to be excreted naturally is approximately 1.3%, and the necessity of an operation to remove the stone is obvious.[10] Single-stage surgery to remove the stone with enterotomy and repair the bilioenteric fistula in the same session is a more invasive procedure and has been associated with prolonged hospitalization, increased likelihood of postoperative complications, and mortality.[10,12] Effective exploration of all bowel loops during the surgery is important for the detection of the second gallstone, which is present in 3-16% of the intestinal loops. Milking the detected stones proximally, longitudinal enterotomy, and transverse closure reduce the risk of postoperative stenosis.[13]

Endoscopy and laparoscopy can be used depending on where the stone has obstructed. İn our case, we started operation laparoscopically, and in exploration we detected enclaved stone in the terminal ileum that prevented laparoscopic manipulation. Then we performed hand-assisted enterotomy and stone extraction.[11] In two-stage surgery, after the diagnosis of gallstone ileus, the stone is removed by enterotomy, and fistula repairs and cholecystectomies of patients with American Society of Anesthesiologists Classification (ASA) 3-4 and poor metabolic status and/or lung reserve are left for a second operation to be performed 4-6 weeks later.[12] (Figure 3) When older publications were examined, it was observed that delayed fistula repair in two-stage surgery may lead to the development of recurrent GI, recurrent cholangitis attacks, and increased risk of gallbladder cancer.[14,15] In another study, spontaneous closure of the fistula in 61.5% of the patients when a second operation was planned in two-stage surgery showed that a second operation may not be needed.[16] So two-stage surgery is recommended for patients with persistent biliary complaints (recurrent cholecystitis, cholangitis) after enterotomy.

Gallstone ileus, seen in elderly patients with high comorbidities, is an important life-threatening disease. It was determined that 50% of the patients presenting with GI had a history of cholelithiasis. Considering GI in the differential diagnosis and raising awareness about this disease in patients who present with symptoms and signs of intestinal obstruction and have a previous history of cholelithiasis will reduce the high mortality and morbidity of the disease by providing early diagnosis and treatment of the disease. Multicenter and standardized studies are needed to establish an effective treatment algorithm for GI.

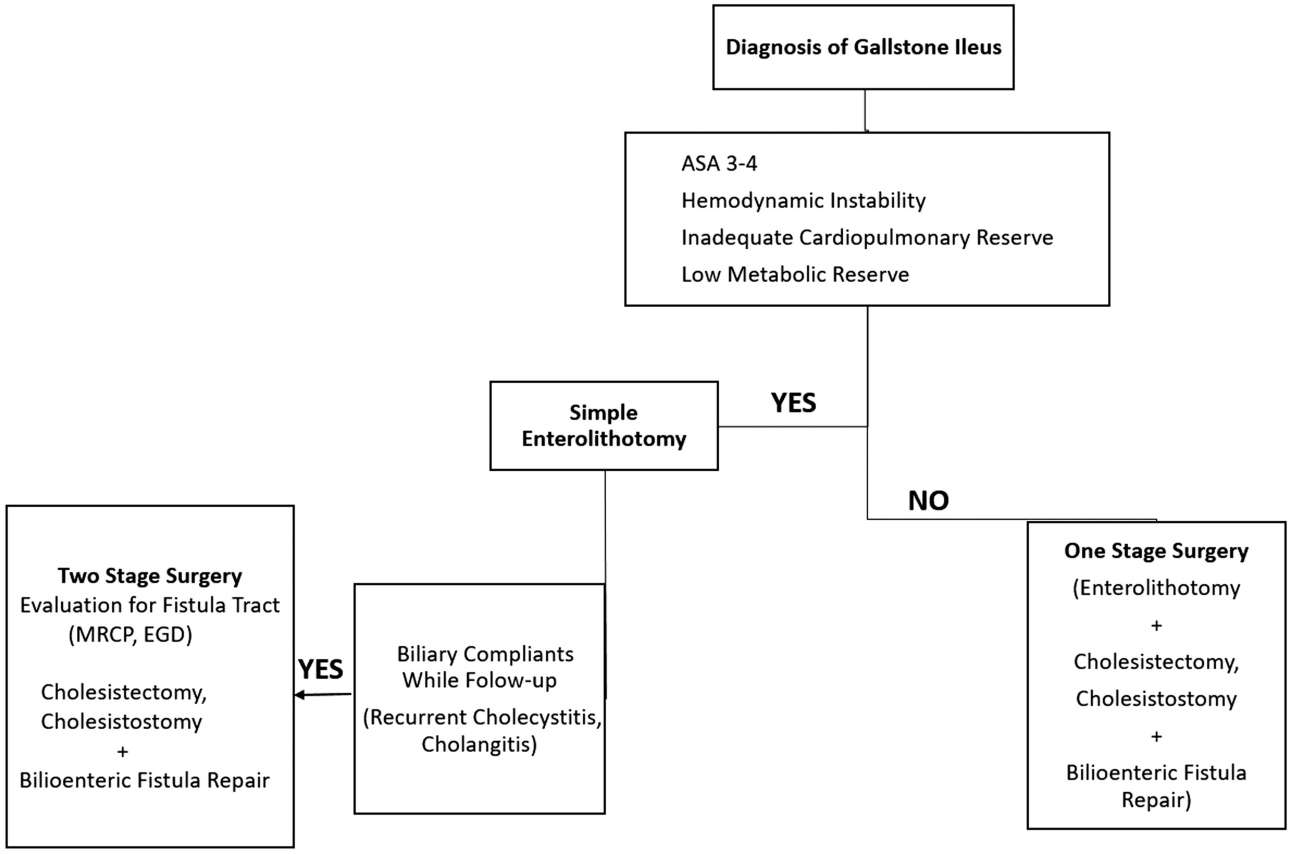

Figure 3. Gallstone ileus treatment algorithm.

Informed Consent: Informed consent was obtained from the patient so that his data could be used in scientific studies.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – E.T., S.E., S.P.; Design – E.T., S.E., O.Ş., S.P.; Supervision – E.T., S.E., O.Ş., S.P.; Resources – E.T., S.E.; Materials – E.T., S.E.; Data Collection and/or Processing – E.T., S.E.; Analysis and/or Interpretation – E.T., S.E.; Literature Search – E.T., S.E.; Writing Manuscript – E.T., S.E.; Critical Review – E.T., S.E., O.Ş., S.P.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support.

References

1. Inukai K. Gallstone ileus: a review. *BMJ Open Gastroenterol.* 2019;6(1):e000344. [CrossRef]
2. Aldo C, Lorenzo M, Olgerta L, Alberto C, Licia U, Melchiore G. Rolling in the deep: imaging findings and diagnostic pearls in gallstone ileus. *Surg Res Pract.* 2020;2020:1421753. [CrossRef]
3. Farrell I, Turner P. A simple case of gallstone ileus? *J Surg Case Rep.* 2015;2015(1). [CrossRef]
4. Ayantunde AA, Agrawal A. Gallstone ileus: diagnosis and management. *World J Surg.* 2007;31(6):1292-1297. [CrossRef]
5. van Hillo M, van der Vliet JA, Wiggers T, Obertop H, Terpstra OT, Greep JM. Gallstone obstruction of the intestine: an analysis of ten patients and a review of the literature. *Surgery.* 1987;101(3):273-276.
6. Martín-Pérez J, Delgado-Plasencia L, Bravo-Gutiérrez A, et al. Gallstone ileus as a cause of acute abdomen. Importance of early diagnosis for surgical treatment. *Cir Esp.* 2013;91(8):485-489. [CrossRef]
7. Ploneda-Valencia CF, Gallo-Morales M, Rinchon C, et al. El íleo biliar: una revisión de la literatura médica. *Rev Gastroenterol México.* 2017;82(3):248-254. [CrossRef]
8. Muthukumarasamy G, Venkata SP, Shaikh IA, Somani BK, Ravindran R. Gallstone ileus: surgical strategies and clinical outcome. *J Dig Dis.* 2008;9(3):156-161. [CrossRef]
9. Sahsamanis G, Maltezos K, Dimas P, Tassos A, Mouchasiris C. Bowel obstruction and perforation due to a large gallstone: a case report. *Int J Surg Case Rep.* 2016;26:193-196. [CrossRef]
10. Reisner RM, Cohen JR. Gallstone ileus: a review of 1001 reported cases. *Am Surg.* 1994;60(6):441-446.
11. Nuño-Guzmán CM, Marín-Contreras ME, Figueroa-Sánchez M, Corona JL. Gallstone ileus, clinical presentation, diagnostic and treatment approach. *World J Gastrointest Surg.* 2016;8(1):65-76. [CrossRef]
12. Halabi WJ, Kang CY, Ketana N, et al. Surgery for gallstone ileus: a nationwide comparison of trends and outcomes. *Ann Surg.* 2014;259(2):329-335. [CrossRef]
13. Salazar-Jiménez MI, Alvarado-Durán J, Fermín-Contreras MR, Rivero-Yáñez F, Lupian-Angulo AI, Herrera-González A. Gallstone ileus, surgical management review. *Cir Cir.* 2018;86(2):182-186. [CrossRef]
14. Berliner SD, Burson LC. One-stage repair for cholecyst-duodenal fistula and gallstone ileus. *Arch Surg.* 1965;90(2):313-316. [CrossRef]
15. Clavien PA, Richon J, Burgan S, Rohner A. Gallstone ileus. *Br J Surg.* 1990;77(7):737-742. [CrossRef]
16. Kaneda H, Mimatsu K, Oida T, et al. A case of gallstone ileus with naturally closed biliary-entric fistula. *J Nihon Univ Med Ass.* 2007;66:119-123.