

An intriguing case of gallstone ileus after hepaticojejunostomy caused by a “stone on a suture”

Mahir Gachabayov, Petr Mityushin

Department of Abdominal Surgery, Vladimir City Clinical Hospital of Emergency Medicine, Vladimir, Russia

Gallstone ileus (GI) is a mechanical obstruction of small or large bowel caused by gallstone passed to the intestinal lumen through spontaneous or postoperative biliodigestive fistula. A 42-year-old female patient was admitted with the clinical presentation of small bowel obstruction. She underwent hepaticojejunostomy 4 years prior to admission for primary sclerosing cholangitis. Barium meal follows through revealed Rigler's triad. The patient underwent laparotomy which revealed GI. A “stone on a suture” was removed through enterotomy. Patients after cholecystectomy and hepaticojejunostomy can develop GI. Nonabsorbable suture used to create biliodigestive anastomosis can appear to become the frame of a “stone on a suture.”

Key words: Bouveret's syndrome, enterolithotomy, gallstone ileus, hepaticojejunostomy, small bowel obstruction

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INTRODUCTION

Gallstone ileus (GI) is a mechanical obstruction of small or large bowel caused by gallstone passed to the intestinal lumen through spontaneous or postoperative biliodigestive fistula. Spontaneous biliodigestive fistulae are developed in about 1% of patients with gallstone disease^[1,2] while GI occurs in 0.3–0.5% of them.^[3] Besides this, GI accounts for 1–4% among all causes of bowel obstruction.^[3,4] GI in patients after cholecystectomy and/or biliodigestive anastomosis is rare. Moreover, a “stone on a suture” causing GI after previously performed hepaticojejunostomy is even rarer.

CASE REPORT

A 42-year-old female patient was admitted to Vladimir City Clinical Hospital of Emergency Medicine with a 1-day history of colicky abdominal pain, nausea, vomiting. Her past medical history was significant

for primary sclerosing cholangitis. Four years prior to admission she underwent surgery (cholecystectomy and Roux-en-Y hepaticojejunostomy) for primary sclerosing cholangitis and obstructive jaundice in another hospital; no malignancy was revealed. On admission, the patient was hemodynamically stable, tenderness on the left and right iliac fossae on palpation, and succussion splash on auscultation was noticed. Plain abdominal X-ray revealed small bowel air-fluid levels and pneumobilia [Figure 1]. Conservative treatment started including fluid and electrolyte replacement therapy, nasogastric tube; barium meal was given on admission. The first control X-ray after 6 h showed the presence of small bowel obstruction, the second control X-ray after 12 h revealed Rigler's triad, thus proving the diagnosis of GI [Figure 1]. Following unsuccessful conservative management during 12 h, the patient underwent laparotomy which proved GI. The ectopic gallstone with the diameter of 3 cm obstructed terminal ileum 40 cm proximal to the ileocecal valve. Extraluminal fragmentation attempts could cause trauma to the bowel wall because of hard gallstone and edematous bowel wall. Enterotomy

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Address for correspondence: Dr. Mahir Gachabayov, Department of Abdominal Surgery, Vladimir City Clinical Hospital of Emergency Medicine, 600022, Stavrovskaya Street, 6-73, Vladimir, Russia. E-mail: gachabayovmahir@gmail.com

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with gallstone removal was performed [Figure 2]. The gallstone itself was very interesting so that it was formed on a polypropylene nonabsorbable suture probably used for hepaticojejunal anastomosis [Figure 3]. Postoperatively, the patient recovered uneventfully and was discharged on the 12th postoperative day. On the follow-up after 6 months, the patient was well and had no problems regarding sclerosing cholangitis.

DISCUSSION

GI was first found at autopsy and described by a Danish physician Erasmus Bartholin in 1654.^[5] The pathogenesis

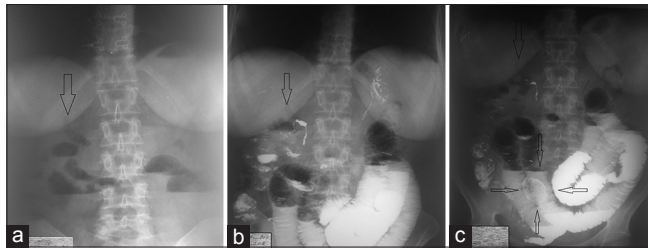


Figure 1: (a) Plain abdominal film showed intestinal obstruction (air-fluid levels) and pneumobilia (shown with arrow), (b) barium follow through after 6 h showed intestinal obstruction and pneumobilia (shown with arrow), (c) barium follow through after 12 h showed Rigler's triad: Pneumobilia (shown with arrow), intestinal obstruction (air-barium levels), and ectopic gallstone (shown with 4 arrows)

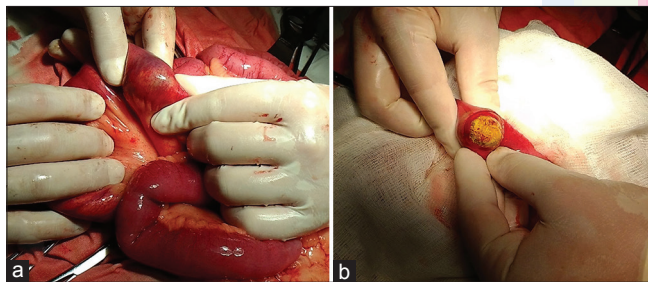


Figure 2: Intraoperative findings, (a) the gallstone is located, (b) enterolithotomy

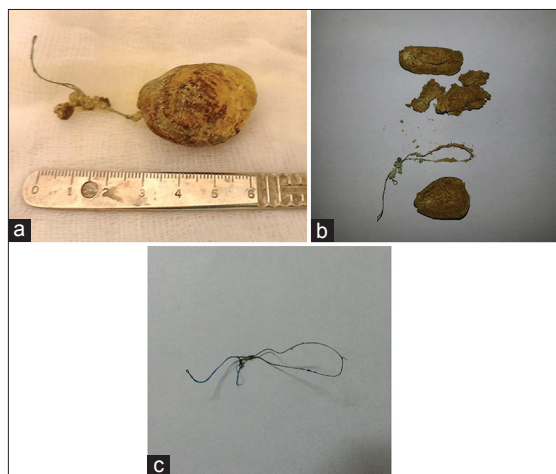


Figure 3: Extracted gallstone, (a) the "stone on a suture," (b) the gallstone is fragmented, (c) nonabsorbable polypropylene suture making the frame of the gallstone

of GI is historically described as follows: Large gallstones lead to pressure necrosis of gallbladder wall, penetration of inflamed preneurotic gallbladder wall to neighbor hollow organs leads to the formation of a spontaneous biliodigestive fistula, allowing gallstones direct access to intestinal lumen.^[6] However, several previously reported cases and our case shows that not only spontaneous but also postoperative biliodigestive fistulae (hepaticojejunal anastomosis) can lead to GI.^[7,8] The cases of GI even after 20 and 30 years after cholecystectomy have been reported.^[8,9]

Surgical items used for different procedures on biliary tract or neighbor organs such as stents, clips, and sutures can lead to gallstone formation.^[7,10] Several cases demonstrating the formation of "stone on a suture" have been reported before, mostly on nonabsorbable sutures.^[10] However, to the best of our knowledge, our case is the first case demonstrating GI caused by a "stone on a suture."

Clinical presentation of GI is varicolored and nonspecific what is one of the reasons of delay in diagnosis. It directly correlates with the site of gallstone impaction. The signs of intestinal obstruction like colicky abdominal pain, nausea, vomiting, and constipation are usually present.^[3,4,6]

The most important role in the diagnosis of GI belongs to radiologic examinations. Rigler's triad is a complex of radiologic signs specific to GI and Bouveret's syndrome including pneumobilia, intestinal obstruction, and ectopic gallstone.^[11] Plain abdominal X-ray alone is helpful in very few cases of GI with the most common probable signs of pneumobilia and intestinal obstruction. However, contrast meal radiography can reveal the gallstone as demonstrated in previously reported cases and in our case. Abdominal ultrasonography in conjunction with plain abdominal X-ray has been shown to increase sensitivity to 74% while the sensitivity of CT has been shown to be 93%.^[12]

Existing treatment modalities of GI are demonstrated in Table 1. Nonoperative management of GI includes various lithotripsy techniques including electrohydraulic, endoscopic mechanical, extracorporeal shock wave, and intracorporeal laser lithotripsy.^[13-16] These techniques are commonly used for gallstones impacted proximal to upper jejunum or in the colon because of simpler access to these locations. However, the most common site of gallstone impaction is terminal ileum (up to 73%).^[14] On the other hand, GI is very often eventually found during laparotomy performed for unexplained small bowel obstruction.^[6] This is the reason why laparotomy is the most common approach for GI. Debates exist on the problem of the extent of surgery. Enterolithotomy alone reduces morbidity and mortality in contrast with definitive one-stage surgery.^[20] However, in the case of acute cholecystitis or residual stones, one-stage

Table 1: Treatment modalities of gallstone ileus

Nonoperative (lithotripsy)
Electrohydraulic lithotripsy ^[13]
Endoscopic mechanical lithotripsy ^[14]
Extracorporeal shock wave lithotripsy ^[15]
Intracorporeal laser lithotripsy ^[16]
Operative
Laparoscopy
Laparoscopic enterolithotomy ^[17]
Single-incision laparoscopic enterolithotomy ^[18]
Laparoscopic-assisted enterolithotomy ^[19]
Laparotomy ^[20]
Simple enterolithotomy
One-stage procedure (enterolithotomy + cholecystectomy and fistula repair)
Two-stage procedure (enterolithotomy first + interval definitive surgery)

surgery reduces the risk of postoperative complications and recurrence of GI.^[20]

Concluding, patients after cholecystectomy and hepaticojejunostomy can develop GI. Nonabsorbable sutures used to form biliodigestive anastomosis can become in the future the frame of a “stone on a suture.”

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Conflicts of interest

There are no conflicts of interest.

AUTHORS' CONTRIBUTION

MG contributed in the conception and the design of the work, acquisition of data, drafting the work, approval of the final version, and agreed for all aspects of the work. PM contributed in the conception and the design of the work, acquisition of data, revising the draft, approval of the final version, and agreed for all aspects of the work.

REFERENCES

- Algin O, Ozmen E, Metin MR, Ersoy PE, Karaoglanoglu M. Bouveret syndrome: Evaluation with multidetector computed tomography and contrast-enhanced magnetic resonance cholangiopancreatography. *Ulus Travma Acil Cerrahi Derg* 2013;19:375-9.
- Palomar de Luis M, Tubía Landaberea JI, Elorza Orúe JL. Spontaneous biliodigestive fistula. *Rev Esp Enferm Dig* 1990;77:33-8.
- Kasahara Y, Umemura H, Shiraha S, Kuyama T, Sakata K, Kubota H. Gallstone ileus. Review of 112 patients in the Japanese literature. *Am J Surg* 1980;140:437-40.
- Clavien PA, Richon J, Burgan S, Rohner A. Gallstone ileus. *Br J Surg* 1990;77:737-42.
- Tan YM, Wong WK, Ooi LL. A comparison of two surgical strategies for the emergency treatment of gallstone ileus. *Singapore Med J* 2004;45:69-72.
- Ravikumar R, Williams JG. The operative management of gallstone ileus. *Ann R Coll Surg Engl* 2010;92:279-81.
- Tsuda I, Shibasaki S, Toi H, Nakamura T, Hase T. A case of gallstone ileus caused by a stent-stone complex that migrated from a hepaticojejunostomy with a long-term biliary metallic stent placement. *Journal of Japan Surgical Association* 2012;73:2637-41.
- Ajiki T, Suzuki Y, Okazaki T, Fujino Y, Yoshikawa T, Sawa H, *et al.* A large stone detected in Roux-en-Y jejunal limb 20 years after excision of congenital choledochal cyst. *Surgery* 2006;139:129-30.
- Zens T, Liebl RS. Gallstone ileus 30 years status postcholecystectomy. *WMJ* 2010;109:332-4.
- Kim KH, Jang BI, Kim TN. A common bile duct stone formed by suture material after open cholecystectomy. *Korean J Intern Med* 2007;22:279-82.
- Rigler LG, Borman CN, Noble JF. Gallstone obstruction: Pathogenesis and roentgen manifestations. *JAMA* 1941;117:1753-9.
- Yu CY, Lin CC, Shyu RY, Hsieh CB, Wu HS, Tyan YS, *et al.* Value of CT in the diagnosis and management of gallstone ileus. *World J Gastroenterol* 2005;11:2142-7.
- Zielinski MD, Ferreira LE, Baron TH. Successful endoscopic treatment of colonic gallstone ileus using electrohydraulic lithotripsy. *World J Gastroenterol* 2010;16:1533-6.
- Lübbbers H, Mahlke R, Lankisch PG. Gallstone ileus: Endoscopic removal of a gallstone obstructing the upper jejunum. *J Intern Med* 1999;246:593-7.
- Meyenberger C, Michel C, Metzger U, Koelz HR. Gallstone ileus treated by extracorporeal shockwave lithotripsy. *Gastrointest Endosc* 1996;43:508-11.
- Alkhusheh M, Tonsi AF, Reiss S, Owen ER, Reddy K. Endoscopic laser lithotripsy for gallstone large bowel obstruction. *Int J Case Rep Images* 2011;2:11-4.
- Bircan HY, Koc B, Ozcelik U, Kemik O, Demirag A. Laparoscopic treatment of gallstone ileus. *Clin Med Insights Case Rep* 2014;7:75-7.
- Watanabe Y, Takemoto J, Miyatake E, Kawata J, Ohzono K, Suzuki H, *et al.* Single-incision laparoscopic surgery for gallstone ileus: An alternative surgical procedure. *Int J Surg Case Rep* 2014;5:365-9.
- Sarli L, Pietra N, Costi R, Gobbi S. Gallstone ileus: laparoscopic-assisted enterolithotomy. *J Am Coll Surg* 1998;186:370-1.
- Doko M, Zovak M, Kopljar M, Glavan E, Ljubicic N, Hochstädter H. Comparison of surgical treatments of gallstone ileus: Preliminary report. *World J Surg* 2003;27:400-4.