

## SURGICAL MANAGEMENT OF CHOLECYSTOENTERIC AND CHOLECYSTOCOLONIC FISTULAS IN GALLSTONE ILEUS: CASE REPORT

Rasa Bradūnaitė<sup>1,2</sup>, Anna Spooren<sup>2</sup>, Kamilis Kobeckis<sup>2</sup>, Kęstutis Strupas<sup>2,3,4</sup>, Aistė Gulla<sup>2,3,4</sup>

<sup>1</sup>*Republican Vilnius University Hospital, Vilnius, Lithuania,*

<sup>2</sup>*Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania,*

<sup>3</sup>*Vilnius University Hospital Santaros Clinics,*

*Abdominal and Oncology Surgery Center, Vilnius, Lithuania,*

<sup>4</sup>*Center of Visceral Medicine and Translational Research, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

**Keywords:** gallstone ileus, fistula, surgery, abdominal surgery.

### Summary

Gallstone ileus (GI) is a serious complication of choledocholithiasis leading to high mortality because it manifests with mostly unspecific mechanical bowel obstruction symptoms such as abdominal pain, nausea, vomiting and constipation. Conservative treatment of GI is very rarely successful and non-invasive treatment methods provide ambiguous results. Surgery is the preferred treatment tactics for GI. The choice between surgical treatment types depends on the localization of the fistula between the gallbladder and the bowel, and patient's general medical condition. Enterolithotomy is a surgical procedure proven to be safe and effective in patients with multiple comorbidities who might experience intraoperative and postoperative complications if longer and extended surgeries were to be performed. For those patients who are healthy enough to avoid certain intra- and post-operative complications, the surgery type is chosen according to the anatomical site of the fistula. Cholecystoduodenal and cholecystoenteric fistulas tend to close spontaneously and only a minor part of them leave open leading to an increased risk of complications and to the need of a second-stage surgery. Therefore, a 'watch and wait' strategy could be implemented by performing enterolithotomy at first with the subsequent follow-up to check for the fistula closure. Cholecystocolonic fistulas do not tend to close naturally, therefore they should be closed during a one-stage surgery as soon as possible in order to avoid the unwanted complications i.e., reflux cholangitis.

### Introduction

Gallstone ileus (GI) occurs when biliary stones migrate from gallbladder to the bowel due to pressure-caused fistula and lead to mechanical bowel obstruction. It is a rare complication of gallbladder stones and makes up a very small part of all ileus cases [1]. As GI causes nonspecific symptoms, it is often diagnosed late and therefore has high mortality rate which varies from 12 to 27% [2]. Surgery is considered to be the treatment of choice. The type and timing of surgery highly depends on patient's general condition and comorbidities, GI presentation and surgeon's skills, and up to date, there is no golden standard surgery for it, however, the main argument in choosing the treatment tactics could be the localization of the fistula.

### Case report

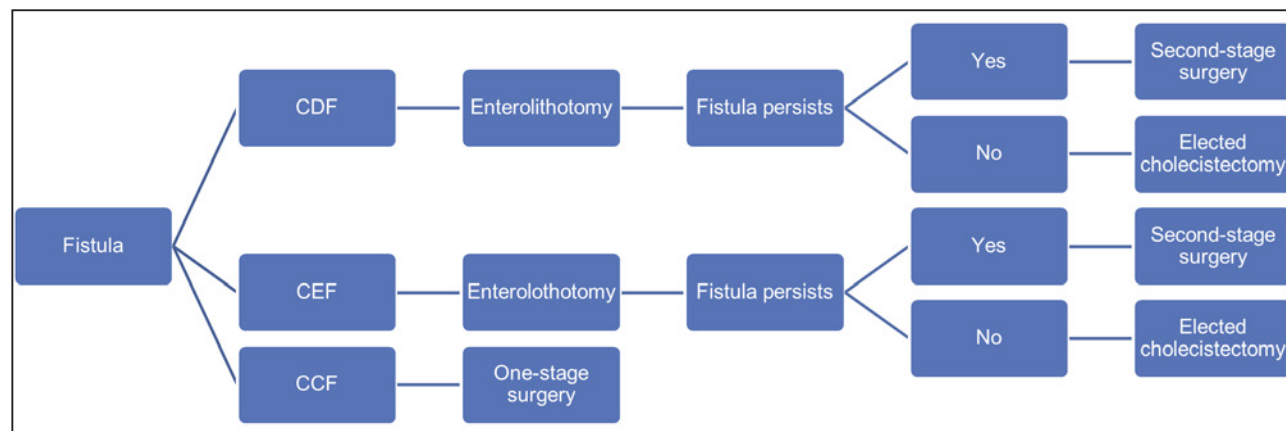
A 70-year-old female presented to the emergency department with complaints of nausea, vomiting and abdominal pain in the right upper abdominal quadrant for the last three days. The patient had a history of cholelithiasis with recurrent biliary colic episodes in the last five years. Her medical history included chronic heart failure, primary hypertension, type 2 diabetes, obesity, chronic obstructive lung disease and urinary incontinence. The vitals were stable, her body temperature was normal and there were no signs of jaundice. On a clinical exam, the patient's abdomen was soft, non-distended and tender to palpation in all areas of abdomen. Laboratory testing revealed neutrophilic leucocytosis (shift to the left) with a mild elevation of C-reactive protein, slightly elevated total bilirubin in the account of unconjugated bilirubin and high urea and creatinine. Abdominal ultra-

sound revealed gallbladder to be 6x3 cm in size and full of multiple stones. Distended lumen of the small bowel up to 4 cm and 'pendulum' bowel movements led to the diagnosis of small bowel ileus. Abdominal computed tomography (CT) revealed chronic cholecystitis and fistula between the gallbladder and duodenum, and one gallstone sized 4 cm in diameter from the gallbladder was found migrated into the small intestine, causing mechanical bowel obstruction. The patient was hospitalized for an urgent surgery which was planned to be a two-stage procedure. Enterolithotomy was performed at first and the stone was removed from the small bowel around 150 centimetres below the ligament of Treitz. During the follow-up magnetic resonance cholangiography was performed and it revealed no active fistula between the gallbladder and the duodenum, therefore, it was decided to refrain from a cholecystectomy with the closure of fistula. The patient was discharged 5 days after the surgery in good condition without any postoperative complications. Elective cholecystectomy was recommended 2 months after the discharge from the hospital.

### Discussion

The most common location of the gallstone in the gastrointestinal tract are the ileum and ileocecal valve due to the narrowest lumen (together making up 60 – 85% of all cases), followed by jejunum (up to 26.9%), duodenum (up to 14.6%) and colon (up to 4.1%) [1,3,4]. As the spontaneous gallstone evacuation with the stool through the rectum occurs very rarely, conservative treatment (decompression with nasogastric tube, adequate analgesia and fluid therapy) which helps to alleviate the symptoms until GI resolves spontaneously is rejected most of the times (5,6). Even though non-operative approaches of the GI treatment including me-

chanical lithotripsy and endoscopy have been evolving, the outcomes are variable and not satisfactory enough; hence, surgery remains the main cornerstone of treatment [3,5,6]. The options of the surgical approach are 1) enterolithotomy, 2) one-stage procedure (enterolithotomy, cholecystectomy and fistula closure all performed at the same surgery) and 3) two-stage procedure (enterolithotomy performed at first and followed by cholecystectomy with fistula closure after 4-6 weeks) [5]. The choice of surgical approach should be based mostly on the site of gallstone impaction and on the clinical state of each patient. For patients in a poor clinical condition and those with concomitant diseases which might become complicated during the surgery, enterolithotomy is considered to be the safest option [3]. The localization of the fistula is the key factor to help determine the treatment tactics or patients who are less likely to suffer from complications (i.e. younger and with less comorbidities). Previous studies suggest that one-stage surgery is considered as the treatment of choice [7] for the cholecystoduodenal fistula (CDF) because the stone extraction can be performed through the fistula opening resection site and all surgical manipulations occur in the same upper right abdominal quadrant, therefore, the surgery should not be as technically difficult and traumatic. Studies report the probability of a spontaneous close in cases of CDF to be high [3]. CDF has a low risk of complications with 11% of cases resulting in cholangitis, as compared to 60% in cholecystocolonic (CCF) fistula [8]. Reisner et al. published a review of 1001 cases in which the authors found one-stage procedure in cases of CDF to have higher mortality rates than enterolithotomy alone (16.9% vs 11.7%), biliary symptoms persisted in only 15% of enterolithotomy patients of which not more than 10% required surgeries, and the GI recurrence rate in this group was <5% [9]. Other studies



**Fig. 1.** The choice of the surgical tactics according to the localization of the fistula

Author: Aistè Gulla, MD, PhD

also report that the mortality after simple enterolithotomy is low, and it is associated with better results than more invasive techniques [9–13]. This approach could also be beneficial in cases when CDF cannot be closed in a one-stage procedure e.g., in elderly patients with comorbidities and in risk of complications like cardiopulmonary resuscitation [14]. Therefore, we propose the enterolithotomy alone as the beneficial, conservative treatment of choice for CDF with a ‘watch and wait’ approach and possible two-stage procedure if the fistula persists. Waiting time for a natural closure is 3–4 months, however, regular patient follow-up is recommended [7]. In case of a cholecystoenteric fistula (CEF) in places other than CDF, two-stage procedure is a preferred treatment method in cases of gallstone impaction at the small intestine because there is a chance of spontaneous closure of the CEF fistula and urgent fistula closure is associated with a high risk of postoperative complications and mortality in one-stage surgeries. Regarding our case and previous cases results, fistula management should be reconsidered after 3–4 months from the first stage procedure. The particular amount of time is given for spontaneous fistula resolution and closure [15].

During this period, usually no emergencies or complications occur and surgical enterolithotomy as a treatment is sufficient (10,16). If during follow-up investigation fistula persists and causes symptoms - second stage operation - fistula closure should be considered (17). In contrast to CDF and CEF, the natural closure of CCF with a reported closure rate of 10% is unlikely, and additionally patients have a high risk of reflux cholangitis due to faecal material moving retrogradely from the colon through the fistula to the biliary system [18–20]; hence, we recommend the one-stage operation as treatment of choice, when the patient’s condition is adequate for the procedure [6,7]. The process of the decision-making in case of a biliary-enteric or biliary-colonic fistulas is summarized in Figure 1.

### Conclusions

1. Mechanical bowel obstruction due to a gallstone is a serious complication of cholelithiasis due to high mortality.

2. Surgical treatment of GI includes enterolithotomy, one-stage surgery and two-stage surgery and the choice of the treatment tactics should depend on patient’s condition and on the localization of the fistula.

3. Cholecystoduodenal and cholecystoenteric fistulas could be managed by enterolithotomy at first and subsequent fistula repair as a second stage surgery if natural fistula closure does not occur, and cholecystocolonic fistula should be managed by one-stage surgery due to high risk of complications.

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## CHIRURGINIAI CHOLECISTOENTERINĖS IR CHOLECISTOKOLONINĖS FISTULIŲ GYDYMO BŪDAI TULŽIES PŪSLĖS AKMENLIGĖS ATVEJU:

### KLINIKINIS ATVEJIS

R. Bradūnaitė, A. Spooren, K. Kobeckis,  
K. Strupas, A. Gulla

Raktažodžiai: tulžies akmenų nepraėjimumas, fistulė, chirurgija, abdominalinė chirurgija.

### Santrauka

Tulžies akmenų sukeltas žarnyno nepraeinamumas (TAN) yra rimta tulžies akmenligės komplikacija, sukianti didelį mirtinumą, nes ji pasireiškia labai nespecifiniais mechaninės žarnyno obstrukcijos simptomais, tokiais kaip pilvo skausmas, pykinimas, vėmimas, konstipacija. Konservatyvus tulžies akmenų sukeltos žarnyno nepraeinamumo gydymas yra retai sėkmingas, o neinvazivūs gydymo metodai suteikia dviprasmiškus rezultatus. Chirurginė operacija yra pageidaujama TAN gydymo taktika. Chirurginio gydymo tipo pasirinkimas priklauso ir nuo fistulės vietos tarp tulžies pūslės ir žarnyno ir paciento bendros medicininės būklės. Enterolitotomija yra chirurginė procedūra, kuri duoda gerus efektyvumo ir saugumo rodiklius pacientams su daug gretutinių ligų, kurie gali patirti daug komplikacijų per ar po operacijų, jei prireiktų ilgesnių chirurginių intervencijų. Pacientams, kurie yra pakankamai sveiki, kad išvengtų komplikacijų per operaciją ir po jos, chirurginės operacijos tipas pasirenkamas pagal fistulės vietą. Cholecistoduodeninės ir cholecistoenterinės fistulės dažniausiai užsiveria pačios, tačiau tik maža jų dalis pasilieka atviros ir taip sukelia padidėjusią komplikacijų riziką, todėl turi būti užveriamos antro chirurginio etapo metu. „Stebėk ir lauk“ galėtų būti įgyvendinta pirmiausia atliekant enterolitotomiją ir paskui reguliariai tikrinant, ar fistulė užsivėrė savaime. Cholecistokoloninės fistulės dažniausiai neužsiveria natūraliai, todėl turėtų būti užveriamos per vieną operaciją, kaip įmanoma anksčiau, kad būtų išvengta nepageidaujamų komplikacijų, pavyzdžiui, refluksinio cholangito.

Adresas susirašinėti: aiste.kielaitė-gulla@mf.vu.lt

Gauta 2023-05-19