

Single Case

Preoperative Diagnosis and Treatment of Cholecystoduodenal Fistula

Norio Yokoigawa Yusai Kawaguchi

Department of Surgery, Kitakawachi Fujii Hospital, Shijyonawate, Japan

Keywords

Preoperative diagnosis and treatment · Cholecystoduodenal fistula

Abstract

The case is about an 87-year-old female. While staying at a facility, she had a fever and abdominal pain and visited our hospital for an up-close examination and treatment. An abdominal CT scan revealed gallstones, gallbladder enlargement, and common bile duct stones. Endoscopic retrograde cholangiopancreatography was performed to confirm the presence of common bile duct stones, which were extracted. At that time, she was diagnosed with a duodenal fistula of the gallbladder and underwent surgery in our department. The gallbladder and duodenum were firmly adhered, and gallstones were palpated between the gallbladder and duodenum. The gallbladder was incised at the fundus to check the lumen, and gallstones were lodged in the fistula with the duodenum. After the removal of gallstones, the gallbladder was dissected, and a fistula with the duodenum was identified. After treating the cystic duct, the fistula was removed, and the gallbladder was removed. Because the duodenal wall was fragile due to inflammation and the fistula was large and difficult to close simply, the duodenal bulb was separated with a linear stapler, and the stomach and jejunum were reconstructed with a 25-mm CDH using the Roux-en-Y technique. The patient's postoperative course was good, and she was discharged from the hospital.

© 2023 The Author(s).
Published by S. Karger AG, Basel

Introduction

Cholecystoduodenal fistula is a disease in which a fistula forms in the duodenum due to severe cholecystitis, and it is a relatively rare disease. These fistulas can cause diverse clinical consequences and in some cases be life-threatening to the patient. In this case, the diagnosis is made by endoscopic retrograde cholangiopancreatography (ERCP) at the time of common bile

Correspondence to:
Norio Yokoigawa, alywk@mx5.canvas.ne.jp

duct stone extraction. In this report, we describe a duodenal fistula of the gallbladder diagnosed at the time of ERCP, which was operated on and showed a good course. The CARE Checklist has been completed by the authors for this case report, provided as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000531486>).

Case Report

The case is about an 87-year-old woman. While staying at a facility, she developed a fever of over 38° and abdominal pain. She was referred to our hospital for an up-close examination and treatment. When she came to the hospital, her consciousness was clear. Body height 160 cm, body weight 62 kg, blood pressure 132/83 mm Hg, mild tenderness in the right hypochondrium, but no recoil pain or muscular defense. Inflammatory findings (WBC: 7,300/ μ L, CRP: 10 mg/dL) were also observed. AST, 122 IU/L; ALT, 229 IU/L; and T-Bil, 3.9 mg/dL were elevated. Abdominal CT scan showed gallstones, air in the gallbladder, dilated common bile duct, and common bile duct stones (Fig. 1). We diagnosed acute cholecystitis, acute cholangitis, or cholecystoenteric fistula.

The common bile duct stones were extracted by endoscopic sphincterotomy. The diagnosis of the duodenal fistula was made by contrast-enhanced imaging (Fig. 2). The patient underwent a 4-port laparoscopic cholecystectomy. Upon observation of the abdominal cavity, the greater omentum has adhered to the right side of the abdomen, which was treated by adhesiolysis. Because the small and large omenta were firmly adhered to the caudal margins of the liver and were difficult to detach, and it was impossible to secure the surgical field, open adhesiolysis was performed. The adhesion between the liver and the right lower diaphragm was dissected, and the liver was mobilized through a median upper abdominal incision. After detachment of the adhesion between the liver and the small and greater omenta, an atrophic gallbladder fundus could be seen. The gallbladder and duodenum firmly adhered, and an induration between the gallbladder and duodenum was palpated, suggesting the presence of gallstones. Cholecystitis was judged to have spread to the duodenum, forming a fistula and stones. A large incision was made at the fundus of the gallbladder to check the gallbladder lumen, and gallstones that had lodged in the duodenum were first removed. The gallbladder was separated near the neck, and the gallbladder was removed.

Since the fistula between the gallbladder and the duodenum was identified, the gallbladder was additionally dissected up to the fistula in the duodenum (Fig. 3). A vascular duct that appeared to be a gallbladder duct was identified and treated by ligation. The fistula in the duodenum was large, and caused severe inflammation. Although suturing was performed by layer-to-layer method, there was concern that simple closure alone would result in duodenal stenosis and suture failure. The stomach and jejunum were reconstructed using the Roux-en-Y technique with a 25-mm CDH. The surgery was terminated by placing a drainage tube on the subhepatic surface. The only pathological finding was chronic cholecystitis with no malignant findings. The patient was discharged from the hospital with no postoperative complications.

Discussion

Duodenal fistula is a rare disease, accounting for only 0.2% of cholecystolithiasis cases. The prevalence of internal biliary fistula is less than 0.3% in patients with gallstone disease [1]. The relative frequency of fistula is cholecystoduodenal (60%), cholecystocolic (15%), cholecystogastric (5%), and choledochoduodenal (5%) [2]. The most common site of

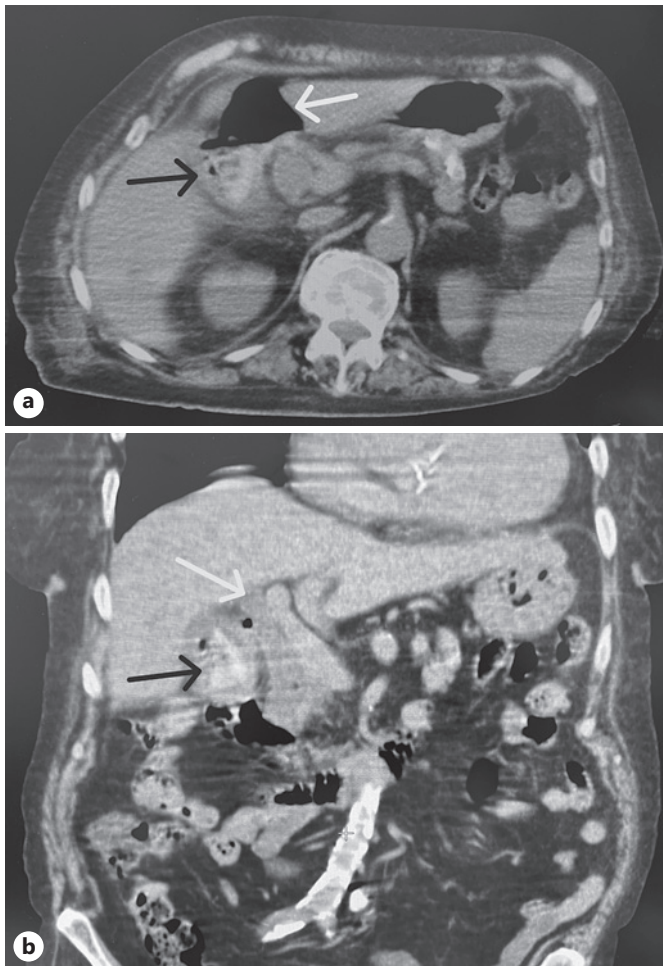


Fig. 1. a CT of the abdomen. CT showed gallstone and air in the gallbladder (black arrow) and air in the duodenum (white arrow). **b** CT of the abdomen. CT showed gallstone in the gallbladder (black arrow) and dilated common bile duct (white arrow).

cholecystoenteric fistula is the duodenum, which accounts for about 80% of all fistulas of the gastrointestinal tract. Chronic cholecystitis with gallstones is reported to cause about 90% of cholecystoenteric fistulas [3].

Preoperative diagnosis should be based on pneumobilia by abdominal CT scan, which should raise suspicion of a cholecystoenteric fistula or Mirizzi syndrome. If a previous CT scan has been performed, a cholecystoenteric fistula can also be suspected, even if large gallstones are reduced or absent on CT scan. In other cases, the diagnosis may be made by ERCP, DIC-CT, or enterography [4, 5]. In this case, too, a preoperative CT scan showed intrahepatic bile duct pneumatosis, and contrast ERCP at the time of stone extraction revealed the formation of a fistula between the gallbladder and the duodenum. The fistula was filled with calculi, which appeared to be gallstones. Clinical symptoms of cholecystoduodenal fistula include gallstones, fever due to cholecystitis, abdominal pain, and jaundice. However, there are no characteristic symptoms, and diagnostic imaging is beneficial. If the diagnosis is not made preoperatively and is made intraoperatively, the fistula is recognized as an adhesion that is difficult to remove.

Surgery is the first-line treatment for cholecystoduodenal fistula, although spontaneous fistula closure has been reported. As for surgical methods, there have been many reports of laparoscopic surgery in recent years due to improvements in surgical techniques and the

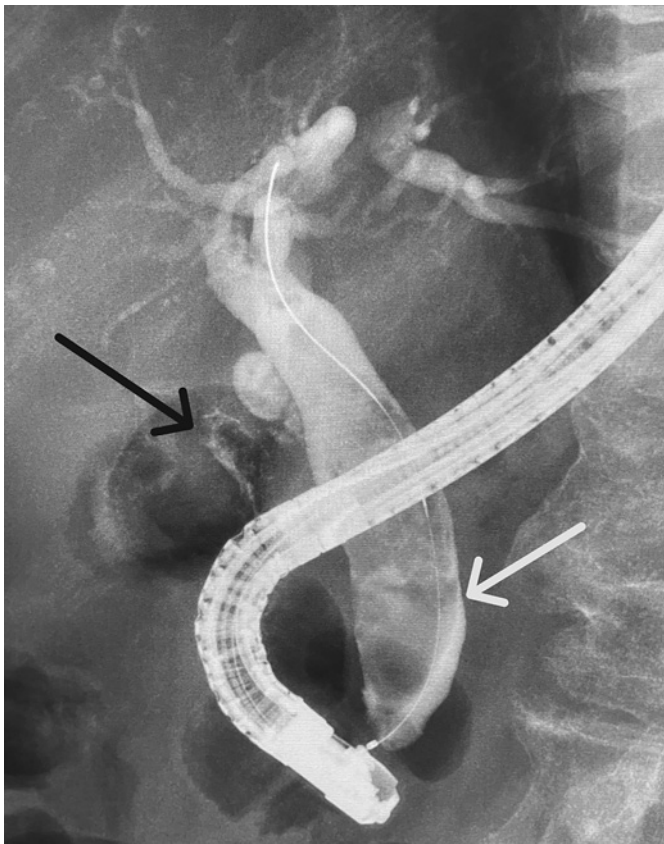


Fig. 2. ERCP. ERCP showed air in the gallbladder and suggested the presence of biliary fistula between the gallbladder and duodenum (black arrow). It showed stone or debris in the common bile duct (white arrow).

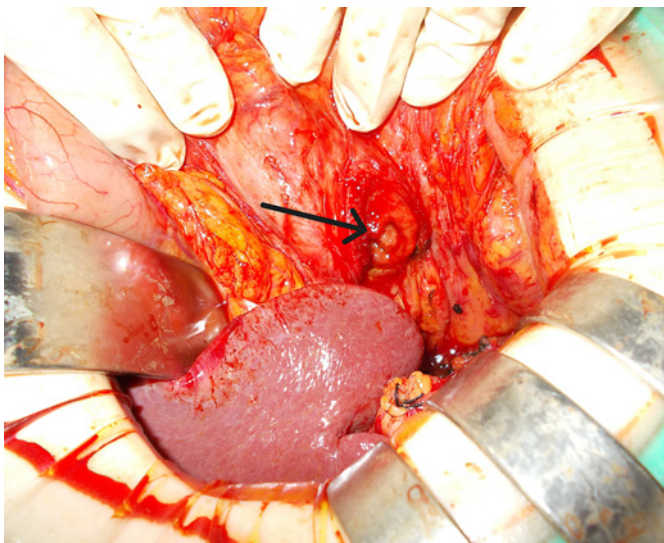


Fig. 3. The finding of operation. The gallbladder was dissected up to the fistula in the duodenum (black arrow).

development of surgical instruments. Some reports suggest that taping the fistula area to elevate it and using the endo-GIA to close the fistula may be useful. Angrisani et al. [6] compared laparoscopic surgery with open surgery, found no difference in intraoperative and postoperative complication rates between the two groups, with the mean postoperative hospital stay significantly longer in the latter group, and reported the safety and efficacy of laparoscopic surgery [6, 7]. However, this method is not always safe. In cases like the present case, where the inflammation is severe, and dissection is difficult, it would be better to switch to open surgery without hesitation. A comprehensive decision must be made based on the patient's general condition and intra-abdominal conditions, as well as the degree of skill in the surgical technique.

After the gallbladder is detached from the liver bed and the fistula with the duodenum is identified, the fistula must be treated correctly. This closure is frequently done by linear stapler or the endo-GIA, although other methods, such as covering with the greater omentum, have also been reported [8]. In this case, the fistula was large, and gallstones were lodged in it. In addition, the duodenal wall was fragile due to inflammation, and it was difficult to close the fistula with linear stapler. This layer-to-layer suturing method was attempted, but duodenal stenosis and suture failure were a concern; thus, the duodenum, including the fistula, was separated using a linear stapler, and the stomach was partially resected using the Roux-en-Y method with a 25-mm CDH. The stomach and jejunum were reconstructed using the Roux-en-Y method with a 25-mm CDH, and a J-VAC drainage tube was placed on the subhepatic surface to complete the surgery. No postoperative complications were observed, and the patient's food intake was good. We reported a case of cholecystoduodenal fistula due to chronic cholecystitis diagnosed preoperatively, treated surgically, and followed up well.

Statement of Ethics

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. Ethical approval is not required for this study in accordance with local or national guidelines.

Conflict of Interest Statement

The authors declare that they have no conflicts of interest.

Funding Sources

There were no funding sources.

Author Contributions

Norio Yokoigawa contributed to and drafted the design of the report. Yusai Kawaguchi has read and approved the final version of the manuscript.

Data Availability Statement

All data generated during this study in this article are included. Further inquiries can be directed to the corresponding author.

References

- 1 Brown KK, Cunningham K, Howell A, Vance JE. A rare case of cholecystoduodenal fistula with rapid distal gallstone migration. *Am J Case Rep.* 2021;22:e929150.
- 2 Clavien PA, Richon J, Burgan S, Rohner A. Gallstone ileus. *Br J Surg.* 1990;77(7):737–42.
- 3 Stull JR, Thomford NR. Biliary intestinal fistula. *Am J Surg.* 1970;120(1):27–31.
- 4 Young A, Yusuf GT, Fang C, Metafa A, Gupta S, Sidhu PS. Cholecystoduodenal fistula identified on oral contrast-enhanced ultrasound. *J Ultrasound.* 2022;25(2):339–42.
- 5 Malik A, Bani Fawwaz BA, Michael M, Akram MO, Khan AH. Endoscopic retrograde cholangiopancreatography (ERCP): used to diagnose and treat cholecystoduodenal fistula, a rare clinical entity. *Cureus.* 2021;13:e18962.
- 6 Angrisani L, Corcione F, Tartaglia A, Tricarico A, Rendano F, et al. Cholecystoenteric fistula (CF) is not a contraindication for laparoscopic surgery. *Surg Endosc.* 2001;15(9):1038–41.
- 7 Wang W-K, Yeh CN, Jan YY. Successful laparoscopic management for cholecystoenteric fistula. *World J Gastroenterol.* 2006;12(5):772–5.
- 8 Huang SF, Han YH, Chen J, Zhang J, Huang H. Surgical management of cholecystoenteric fistula in patients with and without gallstone ileus: an experience of 29 cases. *Front Surg.* 2022;9:950292.