

Laparoscopic Repair of Cholecystenteric Fistula in a 45-Year-Old Nonambulatory Woman

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In laparoscopic surgery for biliary disease, cholecystenteric fistula is an incidental finding in 0.5% to 7% of cases and occurs at a general rate of 0.2% to 0.4% at autopsy, as reported by Nadu et al.¹ Other researchers have found the incidence of cholecystenteric fistula to be 2%.² Frequently, cholecystenteric fistulas are asymptomatic and do not reliably appear on radiographs and thus are not found until laparoscopy. Previously, such a lesion represented a contraindication to laparoscopic cholecystectomy. As a result of increased surgical expertise, however, laparoscopic repair of incidental cholecystenteric fistulas is now possible.

This article presents the case of a cholecystenteric fistula in a 45-year-old nonambulatory woman. The clinical presentation, etiology, and pathophysiology are briefly reviewed. The surgical technique for laparoscopic repair and the contraindications are also discussed.

CASE PRESENTATION

A 45-year-old woman presents to a general surgeon's office for evaluation of a chronic history of severe right upper quadrant and epigastric pain. The patient is nonambulatory secondary to congenital hydrocephalus; she is mentally retarded and has a seizure disorder that is controlled with medications (phenytoin, divalproex, gabapentin, lorazepam). The patient can communicate well.

History

The patient experienced increasing abdominal discomfort and bloating throughout the 6 weeks before presentation. She also experienced prior episodes of similar right upper quadrant pain over a period of 8 to 9 months; this pain either did not persist or was not as intense as the present episode.

The patient reports no diarrhea, jaundice, nausea, vomiting, or fever. No change in urine or stool color is noted. The patient denies any recent falls or trauma to

the affected area. Pertinent medical history consists of chronic constipation caused by a nonambulatory state, a history of gastrointestinal bleeding secondary to peptic ulcer disease, an esophageal hiatal hernia with reflux, and no prior abdominal surgeries.

Physical Examination

The patient is a normally developed, nourished, and pleasant 45-year-old woman. She is verbal and nonambulatory. Hydrocephalus is noted on examination, and her neck is short in nature; her thyroid is normal.

Chest examination reveals an abnormal appearance as a result of severe rotoscoliosis. Her lungs are clear to auscultation and percussion, and no wheezes or rhonchi are noted. Cardiovascular examination reveals regular heart rate and rhythm. The patient has a loud-blowing grade III systolic murmur, and she has a known mild aortic/mitral valve regurgitation.

Abdominal examination reveals good bowel sounds. On palpation, the abdomen is soft with mild right upper quadrant tenderness. No masses or herniations are noted. Musculoskeletal examination reveals significant rotoscoliosis of the dorsal lumbar spine. Neurologic examination reveals that cranial nerves II through XII are intact. Extremity examination reveals deep tendon reflexes of a grade 1 of 4 bilaterally. All remaining findings on physical examination are negative.

Laboratory and Radiographic Evaluation

Laboratory evaluation reveals normal leukocyte count, hemoglobin, hematocrit, and mean corpuscular volume. Alkaline phosphatase is elevated at 133 U/L, but all other liver function test results are normal.

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Plain abdominal radiographs show an intestinal ileus and a large amount of fecal residual. This finding correlates with the patient's nonambulatory status and history of chronic constipation. There is no evidence of extraluminal air in the right upper quadrant and no gas within the gallbladder or biliary tree.

Ultrasonography of the right upper quadrant is performed, but visualization of the gallbladder is difficult because of the intestinal ileus. Several small (4 mm) stones are present, the gallbladder is contracted, and the wall of the gallbladder is thickened. No biliary obstruction is apparent.

Hospital Admission, Treatment, and Outcome

Based on the ultrasound findings (ie, cholelithiasis and thickening of the gallbladder wall, suggesting chronic cholecystitis), the patient is scheduled for laparoscopic cholecystectomy and admitted to the hospital.

During routine laparoscopic cholecystectomy, a fistulous tract is noted between the gallbladder and transverse colon. The gallbladder appears contracted and encased by dense adhesions, with extension to the omentum. The adhesions are freed with a combination of blunt and sharp dissection. Careful technique is performed to isolate and identify the gallbladder fundus from the adjacent fibrous tissue. Once isolated, a small window is created posterior to the mobilized fistula. The gallbladder is grasped and elevated with gentle traction; this technique allows insertion of the Endo GIA 35-mm stapler (United States Surgical Corporation, Norwalk, CT) across the fistulous connection as well as transection. Removal of the fistula is successful. The gallbladder is then removed using the standard laparoscopic technique; no complications occur.

The patient is discharged the day after surgery. The findings of follow-up examination in 1 week are unremarkable.

DISCUSSION

Clinical Presentation

Research indicates that the duodenum is the most common site for internal fistulas, followed by the colon and stomach.³ Patients usually have an asymptomatic presentation, but several common symptoms have been observed: pain (60% of cases), fever (50%), diarrhea (25%), and jaundice (20%).² Pneumobilia and a small atrophic gallbladder may also signify the presence of an internal fistula.²

Etiology and Pathophysiology

The most common cause of internal fistula is gall-

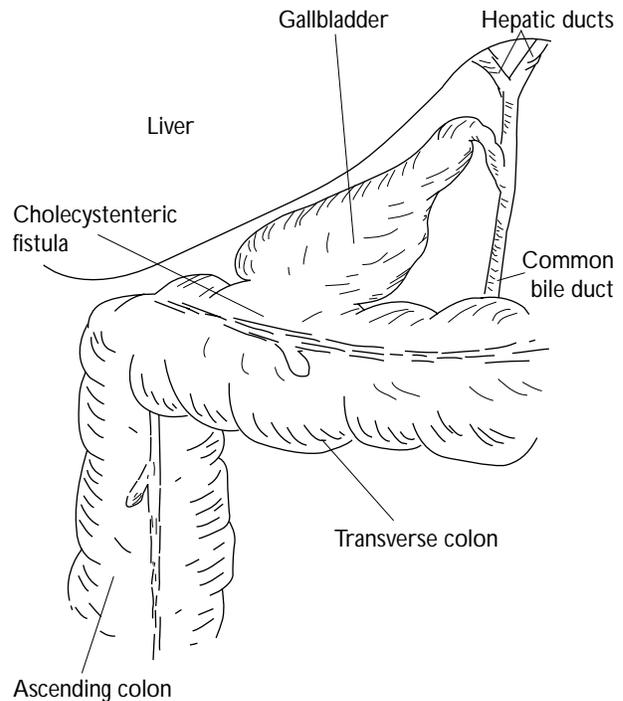


Figure 1. Ascending and transverse colon at the hepatic flexure showing the gallbladder with a cholecystenteric fistula.

stones (90% of cases). Peptic ulcer, malignancy, and trauma represent the other 10% of cases.⁴ Of these causes, chronic cholecystitis with lithiasis is the primary factor in 75% of patients.⁵

Formation of cholecystocolonic fistula follows a stone obstruction in the cystic duct. Acute cholecystitis ensues, with recurrent attacks leading to empyema. Pressure necrosis by calculi in the inflamed gallbladder causes adherence to adjacent viscera. Perforation results, thus creating the fistulous tract (**Figure 1**).

Surgical Technique

Four key points must be observed when performing laparoscopic repair:⁶

- 1) Good visualization—good visualization of the fistula and surrounding area is critical at all times
- 2) Meticulous dissection—meticulous dissection is necessary to avoid damage to the biliary tree and maintain the integrity of adjacent viscera
- 3) Appropriate mobilization—appropriate mobilization of the fistula must be achieved, with creation of a window posteriorly to allow transection by the Endo GIA 30-mm or 35-mm stapler
- 4) Complete resection—resection must include the colon wall in the specimen to rule out

malignancy and to remove inflamed tissue because any tissue left behind may cause late perforation

The surgical method used for this patient is similar to other techniques used to repair internal fistulas. In two articles from the *British Journal of Surgery* regarding repair of cholecystenteric and cholecystoduodenal fistulas, the techniques of careful mobilization and blunt dissection were used.^{2,6} Transection of these fistulas was accomplished using the Endo GIA 30-mm stapler to close the existing defects in the transverse colon and duodenum.

In contrast, in a case of surgical endoscopy to repair a cholecystoduodenal fistula, blunt instrumentation for dissection was used.⁷ Mobilization and traction were used to isolate the fistula, which was then removed with blunt scissors. The site of the fistula showed chronic inflammatory changes, so the defect was repaired laparoscopically with two 3-0 silk sutures on a gastrointestinal needle (figure-eight inverted technique).⁷

Contraindications

Previous contraindications to laparoscopic cholecystectomy were acute cholecystitis, morbid obesity, adhesion of the gallbladder to the biliary tree, and known ductal stones.⁸ In addition, cholecystenteric fistula was an indication for open surgery.⁸ However, with today's improved laparoscopic technical skills, these conditions are no longer obstacles.

SUMMARY

Treatment of internal fistulas depends on the type and extent of fistulous formation. The types of internal fistulas are choledochoduodenal (62%), cholecystoduodenal (19%), cholecystocholedochal (11%), and cholecystocolonic (8%).³

Fistulas with connection to the common bile duct, choledochoduodenal fistulas, and cholecystocholedochal fistulas are technically more difficult to repair. A high risk of damage to the common bile duct is associ-

ated with laparoscopic repair; thus, laparoscopic repair is not possible because the resultant damage would cause bile and/or fecal spillage into the abdominal cavity, leading to peritonitis. These cases are treated by open surgical procedures. Poor visualization of biliary anatomy, secondary to inherited anomaly or created by severe adhesions formed by the inflammatory process, also necessitates treatment with open surgery. Fistulas may be associated with carcinoma of the biliary or intestinal systems; these cases also require the open surgical procedure for accurate diagnosis, repair, and staging.

Cholecystoduodenal or cholecystocolonic fistulas can be managed laparoscopically with excellent results and minimal complications.^{3,5} Laparoscopic repair of these fistulas is technically possible for experienced surgeons. HP

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