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Laparoscopic Resolution of a Cholecystoduodenal Fistula. An Unusual Intraoperative Finding during Cholecystectomy: Report of a Case

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Abstract

Cholecystoenteric fistula (CEF) is a spontaneous abnormal tract between the gallbladder and any segment of the gastrointestinal tract. Is a rare complication of gallstone disease, and although they are not very common, they have a high mortality rate. A 39-year-old female attended the emergency department with acute abdominal pain in the epigastrium that radiated to the right hypochondrium accompanied by nausea and vomiting with a history of presenting the same symptoms intermittently during the last 5 years. A sonography of the liver and bile ducts was performed with evidence of exacerbated chronic lithiasic cholecystitis; a hematic biometry was performed with mild leukocytosis; reason for which laparoscopic cholecystectomy is scheduled that same day. During laparoscopic cholecystectomy, the gallbladder anatomy was lost, during dissection an aberrant duct from what appears to be the infundibulum to the duodenum was identified for which a trans vesicular cholangiography was performed evidencing a cholecystoduodenal fistula. It was decided to close the fistulous tract with a 60 mm endoGIA stapler and the rest of the cholecystectomy was performed in the traditional manner. The vast majority of CEF fistula results in patients with previous cholecystitis or chronic cholecystitis. Most cases occur in women around the age of 60, the female-to-male ratio varies from 1.9 to 2.5:1. The incidence is estimated to affect between 3-5% of patients with cholelithiasis and 0.15-4.8% of all who undergo surgery of the biliary tract. The three most common types are cholecystoduodenal (75-80%), cholecystocolic, and cholecystogastric. Most internal biliary fistulas develop spontaneously. About 91% to 94% of spontaneous internal biliary fistulas are caused by stones in the biliary tract. A CEF can be identified and managed laparoscopically thanks to technological advances that allow us to adequately correct it, as was done in this patient with intraoperative cholangiography and an endoGIA stapler.

Keywords: Cholecystoenteric fistula; Cholecystoduodenal fistula; Laparoscopy; Cholecystectomy; cholelithiasis; Gallbladder; EndoGIA stapler

Introduction

Cholecystoenteric fistula (CEF) is a spontaneous abnormal tract between the gallbladder and any segment of the gastrointestinal tract. CEF is a rare complication of gallstone disease, and although they are not very common, they have a high mortality rate, so timely diagnosis and treatment are of the utmost importance [1,2].

Case Report

This is a 39-year-old female who attended the emergency department presenting acute abdominal pain in the epigastrium that radiated to the right hypochondrium accompanied by nausea and vomiting with a history of presenting the same symptoms intermittently during the last 5 years. As an important history, she

only refers to Diabetes Mellitus of long evolution under medical treatment. Sonography of the liver and bile ducts was performed with evidence of exacerbated chronic lithiasic cholecystitis with a wall >0.94 cm, and a size of the gallbladder of 9.3 x 5.7 x 5.7 cm (Figure 1).

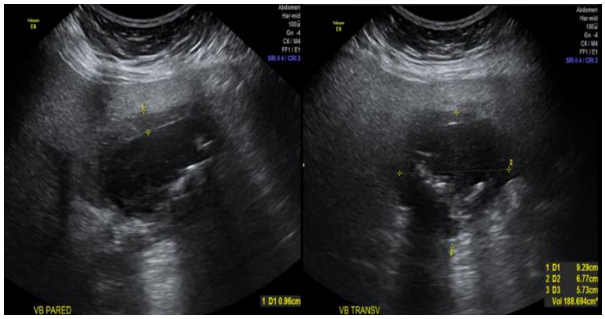

Figure 1: *Sonography of the liver gallbladder and bile ducts was performed with evidence of exacerbated chronic lithiasic cholecystitis with a wall >0.94 cm, and a size of the gallbladder of 9.3 x 5.7 x 5.7 cm.*

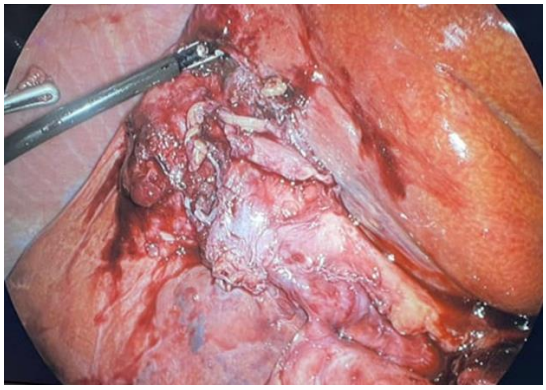

Figure 2: *Large plastron of the gallbladder with loss of the anatomy with traction of the gallbladder fundus.*

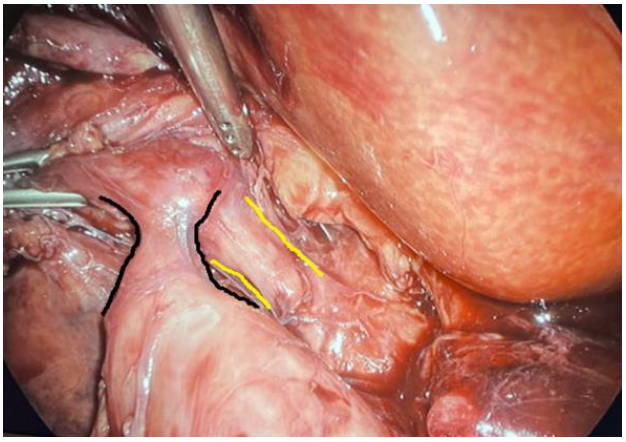

Figure 3: *During the dissection of Calot's triangle, the cystic duct is identified (marked in yellow), and an apparent aberrant duct is identified from the gallbladder infundibulum to the duodenum (marked in black).*

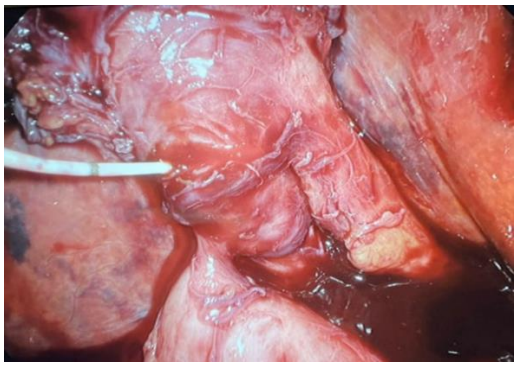

Figure 4: *A cholangiography catheter is introduced at the level of the gallbladder infundibulum to perform a contrast image study.*

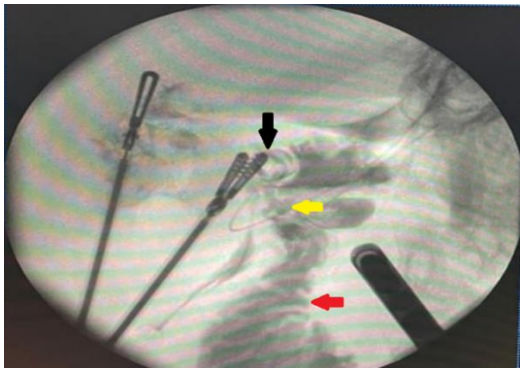

Figure 5: *Cholangiography image with black arrow indicating the cholangiography catheter insertion site, the yellow arrow indicating the fistulous tract, and the red arrow indicating the duodenum.*

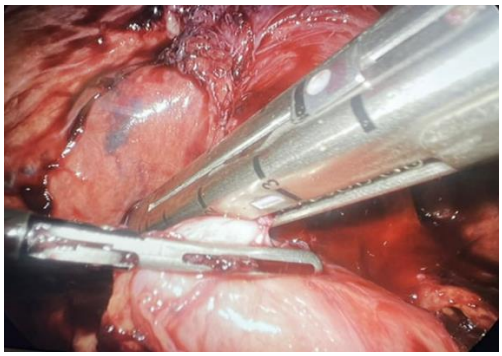

Figure 6: *Closure of the fistulous tract with endoGIA 60 mm stapler.*

Figure 7: *Internal wall of the gallbladder with two holes in relation to the cystic duct to the left and the fistulous tract to the right.*

Hematic biometry was performed with mild leukocytosis of 12.5 at the expense of neutrophils, other laboratories within normal ranges. Reason for which laparoscopic cholecystectomy is scheduled that same day. During laparoscopic cholecystectomy, the fundus of the gallbladder is tractioned and loss of gallbladder anatomy is identified (Figure 2), for which Calot's triangle is dissected, with evidence of an aberrant duct from what appears to be the infundibulum to the duodenum. (Figure 3), so it was decided to perform transvesicular cholangiography, introducing a cholangiography catheter through the gallbladder infundibulum (Figure 4), which evidenced a cholecystoduodenal fistula (Figure 5). It was decided to close the fistulous tract with a 60 mm endoGIA stapler (Figure 6) and the rest of the cholecystectomy was performed in the traditional manner, being extracted through an endobag through the subxiphoid port. When reviewing the extracted piece, two holes are identified in the internal wall of the gallbladder in relation to the cystic duct and the fistulous tract (Figure 7). In the postoperative period with an adequate evolution, tolerating the diet and being discharged on the second postoperative day without evidence of malignancy in the pathology result.

Discussion

The vast majority of CEF results in patients with previous cholecystitis or chronic cholecystitis. Most cases occur in women around the age of 60, the female-to-male ratio varies from 1.9 to 2.5:1 [1,3]. The incidence is estimated to affect between 3-5% of patients with cholelithiasis and 0.15-4.8% of all who undergo surgery of the biliary tract [4,5]. The three most common types of CEF are cholecystoduodenal (75-80% of all CEF), cholecystocolic, and cholecystogastric [1-7]. Historically, CEF was always an incidental finding during surgical procedures [8], Bartholin was the first to record a case of CEF with the entrance of a gallstone into the intestinal tract in a patient examined at autopsy in 1654. Later, in 1890, Courvoisier published an article in which he reported 131 cases of gallstone ileus [9]. CEF was considered a contraindication for laparoscopic cholecystectomy (LC) at the beginning of the laparoscopic era, but since the late 1980s, LC has been a widely accepted method for treating gallbladder disease [5-8]. Most internal biliary fistulas develop spontaneously. About 91% to 94% of spontaneous internal biliary fistulas are caused by stones in the biliary tract [10]. There are two possible explanations for the CEF, the first theory is based on the erosion of stones through the injured wall of the gallbladder into the duodenum, colon, or stomach. The second theory involves acute inflammation with obstruction of the cystic duct, causing the gallbladder to stretch and swell, sometimes rubbing the gastrointestinal tract and forming adhesions between two organs with subsequent gangrenous changes with eventual erosion, thereby establishing a lasting anomalous communication [4-11]. The fistula allows gallstones to migrate into the digestive tract, being responsible for 1-4% of all mechanical intestinal obstructions [3].

The clinical presentation of CEF is highly variable, in its chronic presentation it is indistinguishable from the dyspeptic symptoms of uncomplicated cholelithiasis, such as abdominal weight and bloating, belching, nausea, pain in the right upper quadrant of the abdomen, or back pain [5,10]. In cases of acute presentation, they present with signs compatible with gastric outlet obstruction. Physical examination is frequently nonspecific. Common findings include dry mucous membranes, abdominal distension, abdominal tenderness, and high-pitched bowel sounds. Occasionally, there may be features consistent with gastrointestinal bleeding, often because of a marginal ulcer at the site of the fistula or erosion into surrounding vascular structures [1]. A long history of cholecystolithiasis, especially >5 years, should raise suspicion about the presence of CEF [8]. The diagnosis of CEF is usually an incidental finding, most studies report that the fistulas are revealed incidentally by other radiologic studies to investigate biliary conditions, pancreatic diseases, or intestinal obstructions [4]. An accurate preoperative diagnosis is difficult due to its non-specific presentation. Nevertheless, advances in imaging diagnosis coupled with the development of endoscopic techniques have markedly improved preoperative diagnostic accuracy [2,3]. Computed tomography (CT) has proven to be very useful in the diagnosis, though in some cases, advanced imaging techniques, such as magnetic resonance imaging (MRI), and even invasive techniques, such as endoscopic ultrasound or endoscopic retrograde cholangiopancreatography (ERCP) must be employed [2]. Intestinal obstructions are easily detected by CT, which is also useful for excluding neoplastic lesions located in the hepatic hilum or in the liver. Pneumobilia may be evident on CT and is highly suggestive of a biliary-enteric fistula. Magnetic resonance cholangiopancreatography (MRCP) has superior diagnostic accuracy in about 50% of cases, thus providing better information about the structure and contents of the biliary tree4. The predictive value of ultrasound for detecting CEF remains low, but signs such as thick-walled gallbladder, gallbladder atrophy, and pneumobilia are valuable clues of CEF [3,8]. In addition, when CEF is suspected, upper gastrointestinal imaging and gastroscopy/colonoscopy should be considered, which can observe the fistula or communication between the gastrointestinal tract and the gallbladder [3]. Laboratory studies are typically nonspecific but may show evidence of hyperbilirubinemia, leukocytosis, electrolyte abnormalities, acid-base alterations, and renal failure [1].

Failure to diagnose CEF preoperatively may result in challenges for the surgeon, who may be required to perform unanticipated complex and extensive procedures. This circumstance may cause catastrophic damage to the patients, most of whom are aged and

have comorbidities. Therefore, a preoperative diagnosis, although difficult, is essential to ensure appropriate management [8]. Since most CEF arise due to underlying chronic cholecystitis, cholecystectomy is frequently part of the management strategy [2]. The standard treatment of CEF consists of cholecystectomy and repair of the fistulous opening either by a laparoscopic, or an open approach, depending on the condition of the patient and the experience of the surgeon [4]. Traditionally, most scholars advise CEF should be managed in an open manner because of the dense adhesion and the obscured Calot's triangle [3]. However, open surgery in this patient population is fraught with increased morbidity and mortality (up to 12–27%) because up to 80% of patients with CEF have multiple comorbidities [1]. LC has many advantages over open cholecystectomy, including marked pain relief and a shorter recovery time. In addition, LC is not associated with increased mortality or morbidity [8]. Nevertheless, other studies show that the rate of conversion to open surgery is still high. The need for conversion is most likely related to bleeding, difficulty in intestinal suturing, and inflammation around the gallbladder [3,8]. Whenever a difficult dissection or significant bleeding is found in a laparoscopic approach, intestinal suturing can increase the risk of injury to the biliary tree [4]. An alternative to intracorporeal or extracorporeal sutures for fistula closure is the use of an endoloop or stapler [5]. Finally, endoscopic therapy (mechanical, laser, or extracorporeal shock wave lithotripsy with stone removal) may be considered in those with a large enteric gallstone obstructing the gastric outlet or proximal duodenum [1].

Conclusion

Cholecystoenteric fistula is usually a transoperative finding, since patients who present a vesicular fistula with passage of stones into the gastrointestinal tract debut with symptoms of upper or lower intestinal occlusion depending on the site of stone impaction. However, currently a cholecystoenteric fistula can be identified and managed laparoscopically thanks to technological advances that allow us to adequately correct it, as was done in this patient with intraoperative cholangiography and an endoGIA stapler. We must not ignore the high morbidity and mortality that these patients can present given the chronicity of the disease and the concomitant chronic degenerative diseases in these patients, so the best therapeutic option for these patients will always be the least invasive.

Conflicts of Interests

The authors have no conflicts of interest to declare.

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