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Cholecystocolic fistula from colonic diverticular disease with concomitant choledocholithiasis: A case report

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ABSTRACT

We present a 79 year-old female who consulted for abdominal pain. There was evidence of sigmoid diverticulitis with colonic obstruction and biliary-enteric fistula formation, on the imaging. The patient underwent a Hartmann's Procedure, resection of cholecystocolic fistula, and intraoperative choledochoscopy with common bile duct stone extraction. The pathophysiology and management of cholecystocolic fistula are discussed.

Key words: *Biliary-enteric fistula, cholecystocolic fistula, choledocholithiasis, colonic obstruction, diverticulitis*

Introduction

Cholecystocolic fistulas (CCF) are the second most common type of biliary-enteric fistulas [1-4]. These often occur as a complication of biliary tract disease, associated with chronic inflammation of the gallbladder and erosion of gallstones into the intestinal tract. Other identified causes of biliary-enteric fistulas include: prior biliary surgery, trauma, biliary and gastrointestinal malignancies, and inflammatory bowel disease [2]. We report a case of cholecystocolic fistula associated with colonic diverticular disease, with concomitant choledocholithiasis.

Case Presentation

The patient is a 79 year-old female, who was admitted for a two-month history of colicky abdominal pain and discomfort with associated weight loss. The patient did not have a history of fever, hematochezia or melena, loose bowel movement, decreased stool caliber, or jaundice. The patient had been previously diagnosed with hypertension with secondary congestive heart failure symptoms. An abdominal CT scan revealed a circumferential sigmoid mass causing partial obstruction, with incidental findings of aerobilia within the intrahepatic and extrahepatic biliary tree, dilated intrahepatic ducts, a dilated common bile duct measuring approximately 15 mm, and a distal CBD stone measuring 12 mm. On the colonoscopy, the scope was only inserted up to 40 cm from the anal verge due to non-insufflation of the colon, with multiple diverticula seen along the visualized sigmoid colon, but no intraluminal mass was appreciated corresponding to the one seen on CT scan. Serum carcinoembryonic antigen (CEA) and liver enzymes were of normal values. However, her total and direct bilirubins and alkaline phosphatase levels were elevated.

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Figure 1. Intraoperative trans-cystic cholangiogram plate showing dilated main right and left intrahepatic, common hepatic, and common bile ducts, a non-obstructing filling defect at the distal CBD, and egress of dye into the duodenum.

The patient underwent an exploratory laparotomy to address the colonic obstruction. Intraoperatively, the sigmoid was found to have a strictured segment corresponding to the level documented by colonoscopy. There were multiple diverticula along almost the entire length of the colon. A Hartmann's procedure was done to address the sigmoid stricture. Upon further exploration, the gallbladder was noted to be contracted and fibrotic, no gallbladder stones were noted, and a fistulous connection from the gallbladder dome to the proximal transverse colon was identified.

A cholecystectomy was done. Intraoperative cholangiography (Figure 1) showed dilatation of the intrahepatic ducts and common bile duct (CBD). A filling defect was visualized at the distal CBD. A Choledochoscopy with stone extraction was performed. The choledochotomy was addressed by primary repairs. The fistulous connection to the transverse colon was excised and colorrhaphy was done.

The patient had an uneventful postoperative course. The patient was discharged well on the 5th postoperative day. Histopathologic examination showed: diverticulitis of the sigmoid colon, chronic cholecystitis, and granulation tissue consistent with a fistulous tract, with no evidence of malignancy seen.

Discussion

Biliary-enteric fistulas are rare complications of chronic cholecystitis and other intraabdominal conditions, reported to occur in three to five percent of patients with cholelithasis. The most common type is a cholecystoduodenal fistula, seen in around 70 to 77 percent of cases of biliary-enteric fistulas, while CCFs are the next most common, comprising around 15 percent of all biliary-enteric fistulas, with a reported range of 6 to 26 percent [1-4]. CCF may be found in 0.06 to 0.14 percent of all cases of calculous cholecystitis [2] CCF may have other etiologies such as trauma, intraabdominal surgery, malignancy, and inflammatory bowel disease. In a review of 231 cases, only one patient was noted to develop CCF secondary to colonic diverticular disease.

From the same review, several associated anomalies and pathologies have been noted to occur concurrently with CCF, such as other biliary and enteric fistulas (cholecystoduodenal, cholecystogastric, and duodenocolic), liver abscess, gallbladder malignancy, and anatomical variations of the biliary system. Concomitant choledocholithiasis was reported in 12 of the 231 reviewed cases in the series, with an estimated incidence of 0.05 percent of all cases of CCF [2].

Cholecystocolic fistulas have been noted to have a female preponderance and is associated with more advanced age (the mean age was 68.9 years), which is the demographic our patient falls under. The presenting symptoms of CCF may be varied and are usually a consequence of the chronic inflammatory process and the shunting of bile away from the enterohepatic circulation. Chronic secretory diarrhea is reported as the most common presentation of CCF, and is due to both the stimulatory effect of bile on the colonic mucosa leading to water and electrolyte losses, and fat malab-

sorption in the proximal bowels leading to steatorrhea. Other symptoms usually associated with biliary tract disease such as jaundice, fever, epigastric or right upper quadrant pain, nausea, and vomiting are less frequently reported. CCF may also present acutely as massive lower gastrointestinal bleeding or as gastrointestinal obstruction secondary to gallstone ileus or impaction within the bowels. The possibility of CCF should be entertained in elderly patients presenting with chronic diarrhea, with or without a prior history of biliary tract disease, and should prompt further evaluation using appropriate diagnostic modalities [2]. In this case, the symptomatology of the patient (abdominal pain, weight loss) was more likely caused by the diverticulitis and the secondary colonic obstruction, possibly masking other symptoms attributable to the CCF.

Cholecystocolic fistula may be diagnosed using several imaging procedures.

An ultrasound may show signs of gallbladder inflammation and biliary obstruction. Aerobilia or the presence of air within the biliary tract, is a more specific sign for CCF but this is not consistently seen in all patients. CT scan or MRI may also detect aerobilia and other signs of biliary tract disease. Both hepatobiliary ultrasonography and CT scan were able to document aerobilia in this case, raising the suspicion of an existing biliary-enteric fistula. Barium enema and endoscopic retrograde cholangio-pancreatography are useful in identifying fistulous connections between the biliary and gastrointestinal tracts. ERCP also has the advantage of providing potential therapeutic options for patients who are poor candidates for surgical management [2].

The management of CCF has traditionally been surgical in nature, with cholecystectomy and repair of the fistulous tract being the primary surgical options. Both open and laparoscopic repair of CCF have been reported, and either is considered a viable option depending on the skill and experience of the surgeon and the technical capabilities of the institution. Diversion or enteric exteriorization is not routinely recommended unless being done for unstable patients or patients with severe bowel inflammation and peritonitis. In this patient, surgical management for the diverticulitis was warranted due to the impending colonic obstruction. We opted to construct an end-colostomy after the sigmoid resection rather than a colonic anastomosis, as the presence of preoperative colonic obstruction and poor nutritional status places the patient at higher risk for complications following primary anastomosis.

The CCF and choledocholithiasis were managed concomitantly with cholecystectomy with en bloc colonic wedge resection and stone extraction via choledochoscopy, as it obviates the need for additional surgical or invasive procedures at another time. Other caveats to surgery for CCF include consideration for frozen section or the inclusion of appropriate oncologic margins for the cholecystectomy and colonic resection due to the possibility of malignant fistula formation secondary to an occult gallbladder or colonic cancer [2-4].

Options for nonsurgical management of CCF exist and may be the treatment of choice for patients with multiple co-morbidities for whom surgery carries an increased risk of complications. Decompression of the biliary tree through sphincterotomy, stone extraction, or stent placement via ERCP facilitates spontaneous closure of the fistula due to diversion of bile flow through lower resistance channels away from the fistula tract.

The administration of cholestyramine, which is a bile acid sequestrant, may be useful for the control of secretory diarrhea experienced by patients if nonsurgical management is considered. Prophylactic antibiotics may be given to prevent episodes of ascending cholangitis. Supplementation with fat-soluble vitamins may also be necessary due to the malabsorption from bile shunting [1,3,5].

However, the advantages of non-operative management must be weighed against the risk of developing biliary tract complications such as acute cholecystitis and cholangitis and the presence of occult or subsequent gallbladder malignancy as the diseased gallbladder is left in situ [3,5].

Conclusion

Cholecystocolic fistulas are rare complications of chronic biliary tract disease and may also be secondary to various other intraabdominal pathologies. The presentation of CCF varies among patients, sometimes being discovered incidentally during diagnostics or operations for other biliary tract or gastrointestinal diseases. The benefits and risks of both operative and non-opera-

tive interventions for CCF must be weighed in order to tailor the most appropriate plan for each patient.

Informed consent has been obtained prior to inclusion of patient in this case.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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