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ORIGINAL RESEARCH

Cholecystocolonic fistula as a rare sequela of colorectal cancer: clinical insights and management

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Abstract

Background: Cholecystocolonic fistula (CCF) is a rare but significant complication often associated with chronic cholecystitis and gallbladder diseases. It is the second most prevalent gallbladder-enteric fistula, with a frequency of 8%-26.5% after cholecystoduodenal fistula. This condition is challenging to diagnose due to its nonspecific symptoms and potential for severe complications, including bowel perforation and fecal peritonitis.

Case Presentation: A 52-year-old female patient presented with complaints of pain in the right side and epigastric area of the abdomen, severe diarrhea, fever, and shortness of breath. The patient had a history of hypertension, IBS, anemia, and postnasal drip. Laboratory findings showed elevated blood sugar, white blood cell count, and C-reactive protein levels. Ultrasound revealed increased parietal thickness and layering of the gallbladder with a visible stone in its neck, suggesting acute cholecystitis. A CT scan and colonoscopy were not performed pre-operatively due to the urgency of the clinical presentation.

Surgical Management and Findings: The patient underwent surgery under general anesthesia. Initially planned as a laparoscopic procedure, it was converted to an open surgery due to extensive adhesions and gangrene involving the gallbladder, omentum, and colon. Cholecystectomy and right hemicolectomy were performed. Pathological examination revealed an invasive intestinal-type adenocarcinoma with tumor involvement of both proximal and distal margins. The margin involvement was attributed to severe adhesions and inflammation, but frozen section analysis was not performed intraoperatively.

Conclusion: Cholecystocolonic fistula, while rare, requires a high index of suspicion and a multidisciplinary approach for effective management. Appropriate imaging and readiness for surgical intervention are critical for successful outcomes. This case underscores the importance of early intervention and thorough postoperative care in managing the complexities associated with cholecystocolonic fistula. Further studies are needed to better understand the pathophysiology and optimal management strategies for this condition.

Keywords: Cholecystocolonic fistula, Colon adenocarcinoma, Case report, General surgery.

Introduction

Cholecystocolonic fistula is the second most prevalent gallbladder-enteric fistula, with a frequency of 8%-26.5% after cholecystoduodenal fistula. It is estimated that only 0.06%-0.14% of individuals undergoing cholecystectomy develop this condition, and more than 90% of cases are discovered during surgery (1-3). A larger proportion of women than men is typically affected, and it also tends to occur more frequently in individuals in their 60s or 70s. The presence of pneumobilia, chronic diarrhea, and Vitamin K malabsorption together is pathognomonic for this condition (4). However, the symptoms are not straightforward and can be mild and nondescript. This can make the diagnosis challenging, and the manner in which the condition must be surgically managed can be quite complex (2, 3). If cholecystocolonic fistulas are not recognized during surgery, the consequences can be catastrophic, including the separation of the fistula, colon perforation, and the onset of fecal peritonitis. In the most severe cases, this may lead to sepsis and death (5). Here in this article, we present to you the case of a 52-year-old woman who presented with complaints of pain in the right side and epigastric area of the abdomen, severe diarrhea, fever, and shortness of breath. Here we discuss the course of diagnosis, treatment and, the consequence of treatment.

Case presentation

A 52-year-old female patient presented with complaints of pain in the right side and epigastric area of the abdomen. The pain had been present for three days and was intermittent but had gradually increased in intensity. The patient described the pain as a compressive state that radiated to her back and did not change with positional changes or lying down and there was no paresthesia. The pain was initially transient and located in the epigastrium and right upper quadrant (RUQ) and then stabilized in the RUQ. Physical examination revealed a positive Murphy's sign. In addition to the pain, the patient reported recent urinary incontinence, fever, and shortness of breath which was exacerbated by eating, exercising, and sleeping on the right side. The patient did not experience nausea or vomiting, but she did complain about severe diarrhea.

The patient mentioned taking famotidine with no other medications. She had a history of hypertension, IBS, anemia, and postnasal drip (PND) and had undergone two cesarean sections in the past without complications. The laboratory findings have been presented in Table 1.

Table 1. Laboratory findings on admission

Test name	Result	Units	Normal range
BS	181	mg/dL	Up to 140
WBC	11000	cells/mm^3	4500-11000
Neutrophils	90%	Percent	45-73
Lymphocytes	7.1%	Percent	20-48
RBC	3.28	x10^6/µL	4.5-5.5
Hb	12.2	g/dL	12-16 (female), 14-18 (male)
Plt	371	x10^3/µL	150-450
BUN	40	mg/dL	7-22 (adult)
Cr	1.0	mg/dL	0.5-1.5
AST	32	U/L	5-38
ALT	23	U/L	5-42
Alk P	177	U/L	64-306
Total Bilirubin	1.01	mg/dL	0.3-1.5
Direct Bilirubin	0.2	mg/dL	Up to 0.5
Ca	9.5	mg/dL	8.5-10.5
Phosphorus	3.3	mg/dL	2.5-5
Mg	2.2	mg/dL	1.6-2.5
Serum albumin	4.2	g/dL	3.5-5.5
CPK	102	Iu/L	24-170
CK MB	16	U/L	1-24
Serum LDH	985	U/L	230-480
CRP	55.3	mg/L	Up to 5.9

Abbreviations: BS: blood sugar; WBC: white blood cells; RBC: red blood cells; HB: hemoglobin; Plt: platelet count; BUN: blood urea nitrogen; Cr: creatinine; AST: aspartate transaminase; ALT: alanine transaminase; Alk P: alkaline phosphatase; CRP: C-reactive protein;

Imaging and Diagnostic Workup

The ultrasound report indicated an increase in the parietal thickness and layering of the gallbladder (7mm), and there was a visible stone with a diameter of 5mm in its neck. These findings suggested a possibility of acute cholecystitis. Given the patient's history of severe diarrhea and the ultrasound findings, a CT scan or of the abdomen, MRCP and colonoscopy were not performed pre-operatively due to the urgency of the clinical presentation and the suspicion of acute cholecystitis. However, in retrospect, these additional imaging studies could have provided more detailed information about the extent of the disease.

The infectious disease service was consulted as the patient had a fever. After evaluation, the patient was diagnosed with cholecystitis. Additionally, due to the patient experiencing shortness of breath, the pulmonary service was also consulted and the operation was not hindered.

Intraoperative Findings and Surgical Management

The surgery was performed under general anesthesia and in sterile conditions. Initially, three ports were made - the umbilical port, epigastric port, and a third port located in the distance of the epigastric port - while the patient was in a supine position. However, during the operation, it was discovered that the gallbladder gangrene had spread to the omentum and colon, and the procedure had to be converted to an open one. Following the Kocher incision and the release of adhesions, the duct and arteries were the first to be ligated. Further exploration revealed severe adhesions of the gallbladder, the ascending omentum, and colon, possibly due to perforation and fistulization of the gallbladder into the ascending colon. Due to the thickening of the gallbladder and the adhesion from the hepatic flexion and transverse colon to its proximal part, only the fundus was visible during the surgery. Consequently, it was decided to proceed with the surgery through the same Kocher incision. After the release of adhesions, the duct and arteries were ligated, and cholecystectomy was performed. In addition, the site of the colon perforation and fistulization was treated by extending the incision and releasing the colon, resulting in a right hemicolectomy. Finally, a corrugated drain was placed, the fascia was closed with thread 1, and the skin was repaired to complete the operation.

Pathological Findings

The pathology examination was conducted on a colon tissue sample measuring 7x4 cm, which included the associated mesocolonic tissue measuring 5x3x1 cm. The findings of the examination revealed an invasive intestinal-type adenocarcinoma, with the colon tissue appearing to be unusually thick and entirely composed of a tumor mass measuring 4.5x2.5x1 cm. Lymph node dissection yielded 15 nodes, all negative for malignancy. Of note, both proximal and distal margins measured 3.5 cm and 3 cm, respectively, and were involved in the tumor. This margin involvement was attributed to severe adhesions of the colon to the gallbladder and its release by the surgical team, as well as the opening of the hepatic flexion. The marginal involvement was potentially due to inflammatory adhesions rather than true tumor infiltration. In the microscopic examination of the tumor, the tumoral cells have formed glandular structures and malignant cell sheets; each of the tumoral cells has a large nucleus and prominent nucleoli with abundant mitotic activity. In the figure 1, the above characteristics are visible. Figure 2, the invasion of the cells and malignant glands into the blood vessels can be seen, and in figure 3, the progression of the malignant tumor into the surrounding connective adipose tissue between the transverse colon and the gallbladder is observed.

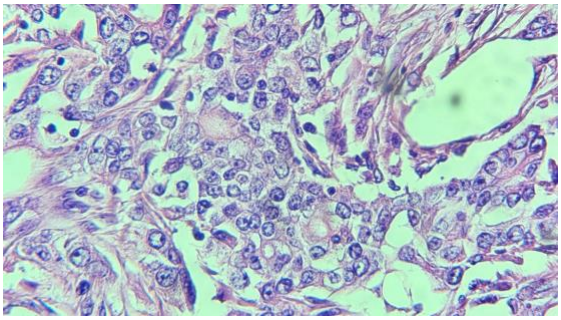


Figure 1. Adenoid cystic carcinoma with moderate cellular differentiation

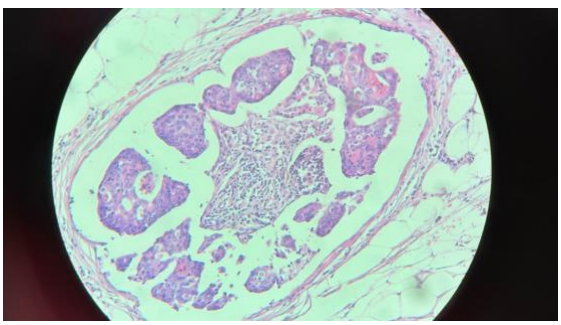


Figure 2. vascular invasion by colorectal adenocarcinoma cells

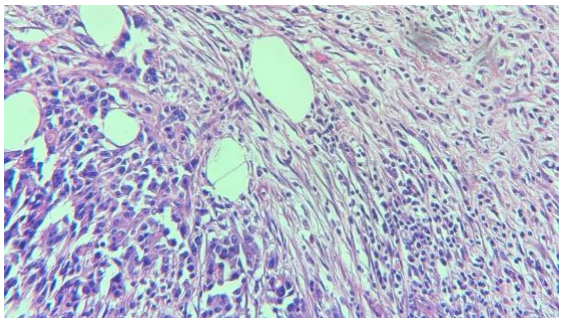


Figure 3. Malignant invasion into the mesocolon

Results

The patient exhibited no significant symptoms following the operation, experiencing only mild weakness and a loss of appetite. A month and a half post-operation, she underwent two chemotherapy sessions, spaced two weeks apart. She is not taking any medications other than her chemotherapy regimen and currently has no symptoms.

Cholecystocolonic fistula, while rare, demands careful consideration and a multidisciplinary approach for effective management. High suspicion in atypical presentations, appropriate imaging, and readiness for surgical intervention are critical for successful outcomes. This case underscores the importance of early intervention and thorough postoperative care in managing the complexities associated with cholecystocolonic fistula.

Discussion

Cholecystocolonic fistula is a rare but significant complication often associated with chronic cholecystitis and gallbladder diseases. This condition presents a complex diagnostic and therapeutic challenge due to its nonspecific symptoms and potential for severe complications (6). The pathophysiology of cholecystocolonic fistula involves chronic inflammation and infection of the gallbladder, which can lead to adhesion and subsequent fistulization between the gallbladder and colon. This typically occurs in the context of gallstone disease, where the persistent inflammatory response results in the erosion of the gallbladder wall and the formation of a fistulous tract to the adjacent bowel (1, 7, 8).

This type of fistula can also be an unusual presentation of colorectal cancer extension. We describe a cholecystocolonic fistula, as a primary complication of adenocarcinoma of the colon. Patients with cholecystocolonic fistula typically present with nonspecific symptoms such as chronic diarrhea (7, 9-11), right hypochondrium pain, and occasionally, fever, weight loss, and jaundice (7). Our patient's presentation with right upper quadrant pain, chronic diarrhea, and severe systemic symptoms such as fever and shortness of breath align with the known symptomatology of this condition. The presence of pneumobilia in imaging studies, as seen in this case, is a key diagnostic clue (12). In our case, the diagnosis was confirmed during surgery when extensive adhesions and gangrene were noted, emphasizing the need for a high index of suspicion and thorough intraoperative exploration.

Surgical intervention remains the cornerstone of treatment for CCF (12). The choice between laparoscopic and open surgery depends on the extent of inflammation and adhesions, with many cases requiring conversion to an open procedure for adequate management (12). In our patient, the initial laparoscopic approach was converted to an open procedure due to extensive adhesions and gangrene involving the gallbladder, omentum, and colon. Cholecystectomy and right hemicolectomy were performed, which is a common approach when significant bowel involvement is present. The potential complications of CCF are significant and can include obstruction (biliary ileus), massive bleeding, colonic perforation, and liver abscess (7). Therefore, careful monitoring and management of any complications, such as infections or anastomotic leaks, are essential in the postoperative period (7). Our patient required an extended incision and diligent postoperative care due to the severity of the inflammation and gangrene, reflecting the complex nature of these cases.This study has several limitations that require consideration. First, the absence of preoperative advanced imaging, such as CT or MRCP, restricted the ability to confirm the cholecystocolonic fistula definitively before surgery, potentially delaying a more tailored approach. Second, the urgency of the clinical presentation precluded a colonoscopy, which

might have provided additional diagnostic clarity regarding the underlying adenocarcinoma. Third, intraoperative frozen section analysis was not performed, leaving uncertainty about the true nature of the involved margins—whether due to tumor infiltration or inflammatory adhesions. Additionally, the delay in initiating adjuvant chemotherapy (1.5 months postoperatively) may have impacted the patient's oncologic outcomes, though this was necessitated by her postoperative recovery. Finally, while the lymph node dissection was adequate (15 nodes examined), the lack of preoperative staging imaging limits the assessment of disease extent at presentation. These limitations underscore the challenges in managing complex cases emergently and highlight the need for a multidisciplinary approach when feasible to optimize diagnostic and therapeutic decisions. Future studies should focus on standardizing preoperative workup and intraoperative protocols for such rare presentations.

Conclusion

In conclusion, cholecystocolonic fistula, while rare, demands careful consideration and a multidisciplinary approach for effective management. High suspicion in atypical presentations, appropriate imaging, and readiness for surgical intervention are critical for successful outcomes. This case underscores the importance of early intervention and thorough postoperative care in managing the complexities associated with cholecystocolonic fistula. Further studies are needed to better understand the pathophysiology and optimal management strategies for this condition.

Conflict of interest

No conflict of interest is declared.

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