Original Research Paper

Volume - 15 | Issue - 04 | April - 2025 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Gastroenterology

A RARE CONNECTION: INSIGHTS INTO CHOLECYSTOGASTRIC FISTULA - A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT **Introduction:** Cholecystoenteric fistulas are rare complications of gallstone disease, with cholecystogastric fistulas (CGF) being the rarest variant, accounting for only 2% of all bilioenteric fistulas. These unusual connections are typically discovered incidentally during surgery due to their non-specific clinical presentation, posing significant diagnostic challenges for clinicians. **Case Presentation:** A 33-year-old female presented with right-sided abdominal pain of 15 days duration without any specific aggravating or relieving factors. Clinical examination revealed a hard, mildly tender globular mass in the right hypochondrium that moved with respiration. Radiological investigations identified an irregular solid lesion in the gallbladder fundus abutting the anterior wall of the gastric antropylorus. Intraoperatively, a gallstone was found impacted at the anterior wall of the gastric antropylorus, forming a fistulous connection between the gallbladder and stomach. The patient underwent successful one-stage surgery comprising cholecystectomy with resection of the involved gastric margin and primary closure of the defect. Histopathological examination of the gastric margin was normal, and the patient recovered uneventfully. **Conclusion:** Although rare, cholecystogastric fistulas are associated with considerable morbidity and require prompt intervention. This case illustrates that a single surgical procedure consisting of stone removal, fistula repair, and cholecystectomy is a feasible treatment approach for patients with cholecystogastric fistulas.

KEYWORDS : Cholecystogastric fistula, bilioenteric fistula, gallstone disease, one-stage surgery, cholecystectomy

INTRODUCTION:

Cholecystoenteric fistulas are abnormal communications most commonly involve the duodenum (77%-90%) and the hepatic flexure of the colon (8%-26.5%)[1] .[2] Cholecystogastric fistula (CGF), an abnormal communication between the gallbladder and the stomach, is the rarest variant, accounting for only about 2% of all cholecystoenteric fistulas.[3] The pathophysiology of cholecystogastric fistulas typically involves chronic inflammation from longstanding cholelithiasis, leading to adhesion formation between the gallbladder and adjacent gastric wall. Persistent inflammation results in pressure necrosis, eventually creating a fistulous tract.[4] Other reported etiologies include trauma, inflammatory bowel disease, peptic ulcer disease, pancreatic malignancy, and iatrogenic causes such as percutaneous cholecystostomyThe clinical diagnosis of CGF poses a considerable difficulty because of its vague and non-specific symptoms. Patients may exhibit a wide spectrum of symptoms ranging from chronic dyspepsia to acute epigastric pain, or may remain completely asymptomatic.[6] Diagnostic imaging, particularly computed tomography (CT) and magnetic resonance cholangiopancreatography (MRCP), may suggest the diagnosis but often fails to definitively identify the fistulous tract.[7] Consequently, most cases are discovered incidentally during surgery, highlighting the importance of thorough intraoperative exploration. The rarity of cholecystogastric fistulas has resulted in limited literature on this condition, with most publications consisting of isolated case reports or small case series. This report presents a case of cholecystogastric fistula in a 33-year-old female patient who underwent successful one-stage surgical management, contributing to the limited body of evidence regarding this uncommon entity.

CASE STUDY:

A 33-year-old female presented to the surgical outpatient department with complaints of dull aching pain in the right side of the abdomen for 15 days. The pain was not associated with any specific aggravating or relieving factors. The patient reported a similar episode approximately one year prior to presentation. She had no history of fever, jaundice, vomiting, or alteration in bowel habits. Notably, there were no reported biliary or epigastric symptoms. The patient had no known comorbidities such as diabetes mellitus or hypertension. On physical examination, the abdomen was soft with tenderness in the right upper quadrant. A hard, mildly tender globular mass was palpable in the right hypochondrium that moved with respiration. There was no indication of hepatomegaly or any free fluid in the abdominal cavity; all other systemic examinations were normal. Laboratory investigations revealed normal complete blood count, liver function tests, renal function tests, prothrombin time-international normalized ratio (PT-INR), activated partial thromboplastin time (APTT), and serum electrolytes. Incidentally, her random blood sugar was elevated at 268.02 mg/dl with HbA1c of 9.7%, suggesting undiagnosed diabetes mellitus. The tumor marker CA 19-9 was found to be within the normal range. An ultrasound of the abdomen revealed a solid mass in the fundus of the gallbladder. Contrast-enhanced computed tomography (CECT) of the abdomen revealed an irregular solid lesion in the fundus of the gallbladder measuring 3.6×2.8×3.6 cm, which was seen abutting the anterior wall of the gastric antropylorus. However, there was no indication of intraluminal extension. For further evaluation, a positron emission tomography-computed tomography (PET-CT) was performed, which showed FDG uptake in the soft tissue density mass lesion in the gallbladder measuring 3.2×4 cm, abutting the antrum of the stomach. No significant hypermetabolic abdominal or retroperitoneal lymph nodes were identified, and no other significant hypermetabolic lesions were detected elsewhere in the body. According to the clinical and radiological assessments, a preliminary diagnosis of a gallbladder mass was established, and the patient was arranged for an open cholecystectomy. Intraoperatively, it was discovered that a gallstone was impacted at the anterior wall of the gastric antropylorus, forming a fistulous connection between the gallbladder and the stomach. This finding clarified the true nature of the "mass" seen on imaging studies.

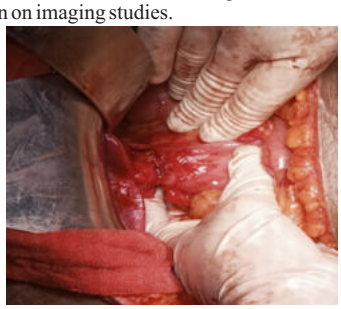

Figure 1: Fistulous connection between stomach and gallbladder intraoperatively.

The surgical team proceeded with cholecystectomy along with resection of the involved margin from the pylorus. The gastric defect was closed primarily in two layers. The resected gastric margin was sent for histopathological examination, which revealed normal gastric mucosa with no evidence of malignancy or granulomatous inflammation.

Figure: Impacted gallstone from fistula

The patient's postoperative course was uneventful. She began receiving oral feeds on the third day after surgery and was discharged on the seventh day. Her newly diagnosed diabetes was managed with oral hypoglycemic agents. At the two-month follow-up, the patient was asymptomatic with well-healed surgical wounds and good glycemic control.

DISCUSSION

Cholecystogastric fistula (CGF) represents one of the rarest forms of cholecystoenteric fistulas, accounting for approximately 2% of all bilioenteric fistulas.[3] The scarcity of reported cases in the literature underscores the uncommon nature of this condition. Our case offers important insights into the clinical features, diagnostic difficulties, and surgical treatment of this uncommon condition.

Pathophysiology :

The development of cholecystogastric fistulas typically follows a sequence of pathophysiological events. The most common initiating factor is chronic inflammation from gallstones, leading to adhesion formation between the gallbladder and adjacent gastric wall. With persistent inflammation, pressure necrosis ensues, ultimately creating a fistulous tract.[9] In our case, the patient had a history of abdominal pain one year prior to presentation, suggesting chronic gallbladder disease that likely contributed to fistula formation. Interestingly, our patient had undiagnosed diabetes mellitus, which was incidentally detected during preoperative workup. The link between diabetes and a heightened risk of gallstone disease is clearly documented.[10] Diabetic patients may have altered gallbladder motility and increased lithogenicity of bile, predisposing them to stone formation and subsequent complications such as fistulization.[11]

Clinical Presentation And Diagnostic Challenges

The clinical diagnosis of CGF presents substantial challenges due to its variable and often non-specific presentation. As demonstrated in our case, patients may present with vague symptoms that do not clearly point toward biliary or gastric pathology. Our patient exhibited right upper quadrant pain but did not display typical biliary symptoms like jaundice, dyspepsia, or food intolerance. This non-specific presentation is consistent with reports by Boland et al., who noted that CGF often manifests with subtle symptoms that may not immediately suggest a fistulous connection.[12] Radiological diagnosis of CGF remains challenging. Ultrasonography typically identifies gallstones but rarely visualizes the fistulous tract. Contrast-enhanced CT may show inflammatory changes and proximity of the gallbladder to the stomach but often fails to delineate the actual fistula.[13] In our case, both CT and PET-CT identified a "mass" abutting the gastric antrum but could not definitively characterize it as a fistula with an impacted stone. This emphasizes the shortcomings of existing imaging techniques in the preoperative diagnosis of CGF. Fujimoto et al. reported similar diagnostic difficulties where preoperative imaging suggested malignancy, but the intraoperative finding was a benign cholecystogastric fistula.[14] This diagnostic uncertainty underscores the importance of maintaining a high index of suspicion for CGF in patients with gallstone disease presenting with atypical symptoms or imaging findings.

Surgical Management: One-Stage versus Two-Stage Approach

The optimal surgical approach for CGF remains a subject of debate. The two primary strategies include one-stage surgery (simultaneous fistula repair and cholecystectomy) and two-stage approach (initial fistula management followed by delayed cholecystectomy).[15]

In our case, we opted for a one-stage approach, performing cholecystectomy along with resection of the involved gastric margin and primary closure of the defect. This decision was influenced by several factors: the patient's good general condition, absence of significant inflammation or edema at the fistula site, and the feasibility of primary closure without tension. Our successful outcome supports the viability of the one-stage approach in appropriately selected cases.

The available literature on surgical methods for CGF is sparse because the condition is quite rare. Ibrahim et al. reported successful outcomes with the one-stage approach in a case series of cholecystoenteric fistulas, suggesting that this strategy is safe and effective when performed by experienced surgeons.[16] Conversely, Glenn et al. advocated for a two-stage approach in cases with significant inflammation or technical difficulties, arguing that this minimizes the risk of complications such as leak or stricture formation.[17] The decision between one-stage and two-stage approaches should be individualized based on patient factors, local conditions, and surgical expertise. Our case demonstrates that the one-stage approach can be safely implemented with good outcomes in selected patients.

Laparoscopic versus Open Approach

Traditionally, cholecystoenteric fistulas were managed via open surgery due to concerns about technical difficulties and potential complications with laparoscopic approaches. However, with advancements in laparoscopic techniques and increasing surgical expertise, laparoscopic management of CGF has been reported with favorable outcomes.[18]

Recent literature suggests that laparoscopic management of cholecystoenteric fistulas, including CGF, is feasible in selected cases. Chowbey et al. reported successful laparoscopic management of 31 cases of cholecystoenteric fistulas, including 2 cases of CGF.[19] The authors emphasized the importance of proper patient selection, appropriate instrumentation, and advanced laparoscopic skills for successful outcomes.

Oncological Considerations

An important aspect of our case was the initial radiological suggestion of a mass lesion, raising concerns about potential malignancy. The PET-CT finding of FDG uptake in the gallbladder lesion further contributed to this suspicion. However, intraoperative findings clarified that the "mass" was actually an inflammatory process with an impacted stone forming a fistula to the stomach. This highlights the potential for cholecystogastric fistulas to mimic malignancy on imaging studies, a phenomenon also reported by Fujimoto et al.[14] The authors described a case where preoperative diagnosis suggested gallbladder cancer, but final histopathology confirmed a benign cholecystogastric fistula. This diagnostic ambiguity emphasizes the need for thorough histopathological evaluation of all resected specimens, as was done in our case. Cholecystogastric fistula is an uncommon yet important complication arising from gallstone disease.

CONCLUSIONS

Cholecystogastric fistula represents a rare but clinically significant complication of gallstone disease.

The main takeaways from this case are:

1. Cholecystogastric fistulas may present with non-specific symptoms that do not clearly suggest biliary or gastric pathology.
2. Current imaging modalities have limitations in definitively diagnosing cholecystogastric fistulas preoperatively.
3. One-stage surgical management, including cholecystectomy with fistula repair, is feasible and effective in selected patients.
4. Cholecystogastric fistulas can mimic malignancy on imaging studies, highlighting the importance of thorough histopathological evaluation.

This case contributes to the limited literature on this uncommon entity and provides valuable insights for clinicians managing patients with complex gallstone disease. Here is the rephrased second sentence:

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Acknowledgments
20. The authors would like to acknowledge Dr. Gopinath Pai and Dr. Ranjith K.B. for their guidance and support throughout the management of this case. We also thank the surgical and nursing teams at KVG Medical College and Hospital for their assistance in patient care.