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A Case Report

Gastric wall cyst associated with gastric leiomyoma: A rare case report

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ABSTRACT

Background: Gastric wall cyst is a rare, benign gastrointestinal lesion that can be challenging to diagnose preoperatively because of its nonspecific clinical presentation and imaging features. This condition is rarely associated with gastric leiomyoma, making preoperative diagnosis particularly challenging.

Case Presentation: A 59-year-old woman was admitted with a history of recurrent upper abdominal pain lasting over one year. Computed tomography, gastroscopy, and endoscopic ultrasound revealed a submucosal mass in the gastric fundus, initially thought to be a gastrointestinal stromal tumor. The patient underwent exploratory laparotomy with wedge resection of the gastric wall. Gross examination revealed a cystic lesion containing dark red, viscous fluid. Histopathological examination revealed a gastric wall cyst and a leiomyoma. On immunohistochemistry, smooth muscle actin (SMA) and desmin were positive, and CD117, CD34, and S-100 were negative, confirming the diagnosis of gastric leiomyoma and excluding gastrointestinal stromal tumor (GIST).

Outcome: The postoperative period was uneventful, and the patient recovered without complications. Six-year follow-up (endoscopy and MRI) revealed no recurrence or residual gastric lesion, and the patient was clinically well.

Conclusion: Gastric wall cyst associated with gastric leiomyoma is an extremely rare entity that can be mistaken for a gastrointestinal stromal tumor on preoperative imaging. Definitive diagnosis is made by histopathological examination and immunohistochemistry. If malignancy cannot be ruled out, complete surgical removal is the most promising treatment, with excellent long-term results.

Introduction

Gastric wall cysts are rare benign cystic lesions of the stomach and represent an uncommon subtype of gastric cystic lesions. These can occur due to developmental abnormalities, gastric duplication, obstruction of mucosal glands, chronic inflammation, or cystic degeneration of the wall of the stomach [1,2]. These lesions are uncommon, may be asymptomatic, and are therefore often found during upper gastrointestinal endoscopy or cross-sectional imaging for other reasons [3]. Clinical signs of gastric wall cysts vary greatly in nature and are dependent on the type, size, and location of the lesion. Small cysts typically do not cause symptoms, but large cysts may cause epigastric pain, nausea, vomiting, gastrointestinal bleeding, early satiety, and gastric outlet obstruction [2,4]. These are non-specific symptoms, and the radiological appearance is similar to that of gastrointestinal stromal tumor (GIST), duplication cyst, pancreatic rest, or other subepithelial gastric tumors, thus making gastric wall cysts a common misdiagnosis [3,5]. Gastric leiomyoma is a very rare benign mesenchymal tumor of the stomach, and is only a small proportion of gastric mesenchymal neoplasms [6]. However, gastric leiomyomas differ from GISTs in lacking immunoreactivity for CD117, DOG1, and CD34, and in showing positive immunoreactivity for smooth muscle actin (SMA) and desmin [6,7]. Immunohistochemical features help make the proper diagnosis and rule out malignant mesenchymal tumors. Gastric wall cyst associated with gastric leiomyoma is a very rare association and has been reported only a few times in the literature [4,8]. Diagnosis is usually confirmed by postoperative histopathological examination and immunohistochemical analysis, as imaging can often present findings similar to those of GIST. A rare case of gastric wall cyst coexisting with gastric leiomyoma that was treated successfully with wedge resection is presented, and the pathological features, diagnostic challenges, surgical management, and long-term clinical outcome are discussed.

CASE PRESENTATION

Patient Information

A 59-year-old woman was admitted to the Department of General Surgery on 16 June 2018 with intermittent upper abdominal pain for more than one year. Previous investigations, including gastroscopy, endoscopic ultrasonography, and computed tomography, had identified a submucosal lesion in the gastric fundus, and the patient was referred for further evaluation and surgical management.

Clinical Findings

On admission, the patient's body temperature was 36.8°C, pulse rate was 88 beats/min, respiratory rate was 20 breaths/min, and blood pressure was 125/72 mmHg. General examination was unremarkable, with no jaundice or lymphadenopathy. Cardiovascular and respiratory examinations were normal. Abdominal examination revealed mild epigastric tenderness without rebound tenderness or guarding. No hepatosplenomegaly or palpable abdominal mass was detected. Shifting dullness was absent, and no abdominal distension or visible peristaltic waves were observed. Bowel sounds were normal (3–5 sounds/min).

Diagnostic Assessment

Laboratory investigations showed a white blood cell count of 5.6 × 10^9/L, red blood cell count of 4.24 × 10^{12}/L, platelet count of 217 × 10^9/L, hemoglobin level of 126 g/L, prothrombin time of 10.4 seconds, clotting time of 14.5 seconds, alanine aminotransferase of 4 U/L, and serum creatinine of 68 μmol/L, all within normal limits.

Gastroscopy demonstrated superficial erosive gastritis and a submucosal protrusion of the gastric fundus with negative Helicobacter pylori testing. Endoscopic ultrasonography revealed a 1.8 × 2.0 cm well-circumscribed hypoechoic lesion arising from the muscularis propria, raising suspicion for a gastrointestinal stromal tumor. Contrast-enhanced CT demonstrated a 28 × 12 mm well-defined soft tissue mass near the gastric cardia, further supporting the diagnosis of a gastric stromal tumor.

Therapeutic Intervention

On 19 June 2018, the patient underwent exploratory laparotomy under general anesthesia. A well-circumscribed cystic lesion was identified on the lesser curvature near the gastric cardia. Because the cyst was firmly adherent to the gastric wall, wedge resection of the involved gastric wall was performed, followed by primary closure. Gross examination of the excised specimen revealed a cyst containing dark-red viscous fluid.

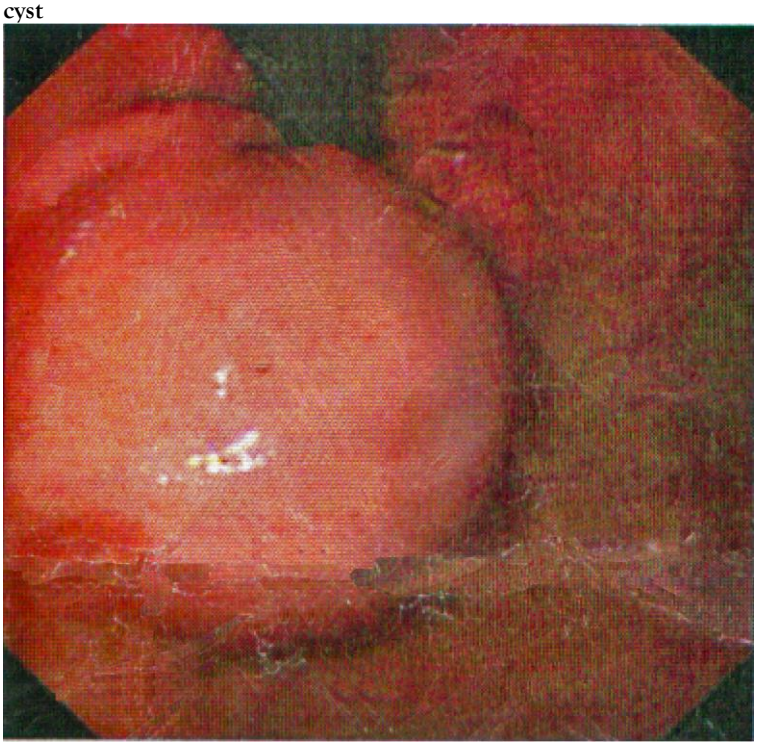
Histopathological Findings

Microscopic examination demonstrated a gastric wall cyst lined by columnar epithelium with an underlying smooth muscle layer. Adjacent tissue showed features consistent with gastric leiomyoma. Immunohistochemical staining demonstrated SMA-positive and desmin-positive tumor cells, whereas CD117, CD34, and S-100 were negative, thereby excluding gastrointestinal stromal tumor and confirming the diagnosis of a gastric wall cyst associated with a gastric leiomyoma.

Follow-up and Outcomes

The postoperative recovery was uneventful. During six years of follow-up, upper gastrointestinal endoscopy and contrast-enhanced magnetic resonance imaging demonstrated no evidence of recurrence or residual disease. At the most recent follow-up in December 2024, the patient remained asymptomatic and in good general health.

Figure 1. Endoscopic ultrasound demonstrating a gastric wall cyst



Endoscopic ultrasonography showing a well-defined hypoechoic cystic lesion arising from the muscularis propria near the gastric cardia, initially suspected to represent a gastrointestinal stromal tumor.

Table 1: Patient Timeline

Date	Clinical Event
June 2017	Initial gastroscopy detected a gastric submucosal lesion.
June 2018	Endoscopic ultrasonography suggested gastrointestinal stromal tumor.
June 2018	Contrast-enhanced CT confirmed gastric fundus mass
19 June 2018	Exploratory laparotomy and wedge resection performed
June 2018	Histopathology confirmed gastric wall cyst associated with leiomyoma
December 2021	Follow-up gastroscopy and MRI showed no recurrence
December 2024	Patient remained asymptomatic with no recurrence.

DISCUSSION

Gastric wall cysts are uncommon benign lesions that present a diagnostic challenge because their clinical and radiological features often mimic gastrointestinal stromal tumors (GISTs), gastric duplication cysts, and other gastric subepithelial lesions [9]. Gastroscopy, endoscopic ultrasonography (EUS), and contrast-enhanced computed tomography (CECT) all pointed towards a possible gastrointestinal stromal tumor in the present case, highlighting that preoperative imaging is not always adequate for differentiating this rare type of gastric tumor. The same has been described in a small case series before [10] in which diagnosis was only made following a definitive operation and histopathology.EUS has been the imaging modality of choice for the evaluation of gastrointestinal subepithelial tumors, as it is sensitive in determining the origin, internal echo properties, and margins of the lesions [11]. Gastric wall cysts and leiomyomas, however, are often well circumscribed hypoechoic masses originating from the muscularis propria, and differentiation from GIST is often difficult. Therefore, complete surgical resection is the best diagnostic and therapeutic option when imaging results are inconclusive, or malignancy cannot be confidently ruled out [11, 12]. Histopathological evaluation and immunohistochemistry are the gold standard in the diagnosis of gastric leiomyoma and its differential diagnosis. In the current case, the gastric wall cyst was seen adjacent to a benign smooth muscle tumor, and was confirmed by microscopic examination. Immunohistochemical staining confirmed gastric leiomyoma with diffuse SMA and desmin staining, and the absence of CD117, CD34, and S-100 staining excluded GIST. In accordance with previous reports of the immunophenotype of benign gastric smooth muscle tumors [12,13], these results were found. If a gastric wall cyst or lesion has an uncertain malignant potential or if it is found to be symptomatic, complete surgical resection is the treatment of choice [14]. Wedge resection offers very good oncological control, without compromising the structure and function of the stomach. Recently, the efficacy of minimally invasive surgery, such as laparoscopic wedge resection and laparoscope-assisted surgery (LECS), has been confirmed by postoperative outcomes in well-selected patients: both procedures have very low complication and recurrence rates and excellent postoperative results [14,15]. The prognosis for complete surgical removal of a gastric leiomyoma is favorable, and recurrence is very rare [15]. Complete surgical removal is associated with a favorable outcome, as confirmed by a good four-year clinical, endoscopic, and radiological follow-up in our patient. This result supports previously published case reports and institutional series, which showed that complete removal of benign gastric smooth muscle tumors results in disease-free survival for several years [16]. Gastric wall cysts are rare but should be considered in the differential diagnosis of gastric submucosal masses, especially if imaging is inconclusive. Greater awareness of this rare entity may improve diagnostic accuracy and facilitate appropriate surgical planning. may help diminish the uncertainty for diagnosis and guide appropriate surgical planning. The definitive diagnosis and differentiation of gastric leiomyoma from GIST and other mesenchymal neoplasms is still highly dependent on histopathological examination with immunohistochemistry [17]. Greater awareness of this rare entity may improve diagnostic accuracy and facilitate appropriate surgical planning.

Patient Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical image.

Ethical Approval

Ethical approval was waived in accordance with institutional policy because this manuscript describes a single clinical case and does not involve experimental research. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Conflict of Interest

The authors declare no conflict of interest.

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The authors received no financial support for this work.

Data Availability

All clinical data supporting the findings of this case report are included within the article. Additional information is available from the corresponding author upon reasonable request.

AUTHORS' CONTRIBUTIONS (ICMJE)

Sun Yong: Conceptualization, patient management, literature review, data interpretation, manuscript drafting, critical revision, and final approval.

Yan Qingchun: Literature review, pathological interpretation, manuscript revision, and final approval.

All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work in accordance with the ICMJE authorship criteria.

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