

Perforation as an uncommon clinical presentation of gastric gastrointestinal stromal tumor: A case report

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ABSTRACT

Gastrointestinal stromal tumors (GISTs) represent the most common mesenchymal neoplasms of the digestive tract. While they can arise at any location along the gastrointestinal tract, the stomach is the most frequent site of origin, followed by the small intestine. We report the case of a 64-year-old male from North Africa with a 4-month history of dull, persistent epigastric pain, which intensified into severe stabbing pain in the 48 h preceding presentation. On admission, he developed signs of acute peritonitis, including diffuse abdominal pain, cessation of stool and gas passage, and hemodynamic instability. Imaging revealed a perforated gastric mass with central necrosis, pneumoperitoneum, and hepatic metastases. Emergency laparotomy confirmed tumor rupture and widespread peritoneal contamination. Despite urgent surgical intervention, the patient succumbed to refractory septic shock within 24 h. This case underscores the necessity of maintaining a high index of suspicion in the evaluation of atypical abdominal emergencies and highlights the value of a prompt, multidisciplinary approach. Early diagnostic work-up combined with timely oncologic intervention was critical in establishing the diagnosis and guiding appropriate management. Such strategies are imperative to optimize clinical outcomes and minimize morbidity and mortality in patients with complex or atypical presentations of GISTs.

Key words: Abdominal emergency, Gastric, Gastrointestinal stromal tumor, Perforation

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal neoplasms of the gastrointestinal (GI) tract and are thought to originate from the interstitial cells of Cajal or their precursors [1]. These tumors are typically characterized by the expression of the KIT protein (CD117) in approximately 95% of cases and, less frequently, by mutations in the *platelet-derived growth factor receptor alpha* gene. GISTs occur most commonly in the stomach (60–70%), followed by the small intestine (20–30%), with rare occurrences in the colon, rectum, or esophagus [1]. The clinical presentation of GISTs is highly variable and largely influenced by the tumor's size and anatomical location. Smaller tumors are often asymptomatic and are discovered incidentally during imaging, endoscopic procedures, or surgical interventions performed for unrelated indications [2]. Among the rare complications of GISTs, spontaneous rupture is particularly uncommon, with the GI lumen being the most frequently reported site of perforation [3].

We present an exceptional case of a gastric GIST manifesting as generalized peritonitis secondary to spontaneous tumor rupture, a rare but potentially fatal complication. This report underscores the diagnostic challenges posed by such atypical presentations and highlights the importance of early recognition and prompt surgical management to improve patient outcomes.

CASE REPORT

A 64-year-old male patient from North Africa, with no medical history, reported epigastric pain for the past 4 months, described as dull and persistent, with intermittent exacerbations to severe, stabbing pain in the 48 h before presentation. The pain was associated with progressive general health decline, aggravated by food intake, and unrelieved by over-the-counter analgesics. He was admitted to the emergency department with diffuse abdominal pain and cessation of stool and gas passage.

On clinical examination, the patient was febrile (38.5°C), tachycardic (100 bpm), and hypotensive (90/60 mmHg). On abdominal examination, he had

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generalized distension with diffuse tenderness, guarding, rigidity, and absent bowel sounds, consistent with peritonitis.

Laboratory tests revealed significant leukocytosis (26,000/mm³) and a markedly elevated C-reactive protein level (320 mg/L). An abdominal computed tomography scan was performed, demonstrating pneumoperitoneum, a heterogeneously enhancing exophytic gastric mass arising from the greater curvature with irregular margins and central necrosis, associated with peritoneal fluid and multiple bilobar hypodense hepatic lesions suggestive of metastases (Fig. 1).

Based on these clinical and radiological findings, an emergency midline laparotomy was indicated. Intraoperative exploration revealed generalized acute peritonitis secondary to perforation of a tumor located on the greater curvature of the stomach. The tumor had invaded adjacent organs, including the spleen and the transverse colon. Extensive liver metastases involving all hepatic segments were also noted (Fig. 2). Given the advanced stage of the disease and the patient's critical status, curative resection was not feasible. Surgical management was therefore limited to peritoneal lavage and placement of drains near the perforation site.

Post-operative progression was unfavorable, with the patient developing refractory septic shock, resulting in death on post-operative day 1.

Histopathological analysis of the intraoperative biopsy specimens confirmed the diagnosis of a gastric GIST (Fig. 3). Immunohistochemistry of the biopsy specimen showed strong positivity for CD117 and DOG1, confirming the diagnosis of GIST, while the Ki-67 index was elevated at 25%, indicating high proliferative activity.

DISCUSSION

GISTs are mesenchymal neoplasms of the GI tract that may develop at any site along its length, from the esophagus to the rectum [1]. GISTs can occur at any age; however, they most often present around age 60, with equal distribution between males and females [4].

The clinical presentation of primary GISTs is often vague and non-specific, with symptoms largely influenced by the tumor's size and anatomical location [2]. Many small GISTs are asymptomatic and are discovered incidentally during imaging or endoscopic procedures performed for unrelated reasons. When symptomatic, patients may report vague abdominal pain, early satiety, bloating, or the presence of a palpable mass. GI bleeding is a frequent manifestation, leading to chronic anemia. In rare cases, GISTs can present acutely with life-threatening complications such as perforation, peritonitis, or intestinal obstruction, highlighting the importance of early recognition and diagnosis [5].

While most reported cases of perforated GIST involve the small intestine, gastric GIST perforation remains exceptionally rare despite the stomach being the most common site of occurrence. This may be attributed to

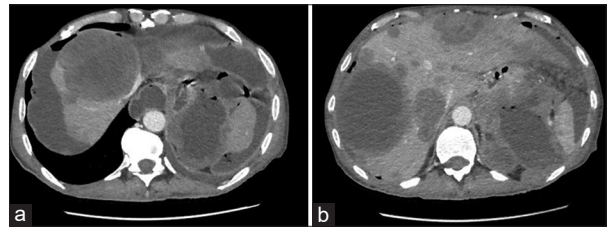


Figure 1: (a) Axial contrast-enhanced abdominal computed tomography (CT) scan reveals free intraperitoneal air (pneumoperitoneum) associated with intra-peritoneal fluid and (b) axial contrast-enhanced abdominal CT scan shows thickening of the gastric wall along the mucosal surface in the proximal body along the greater curvature and bilobar hepatic nodules suggestive of secondary lesions

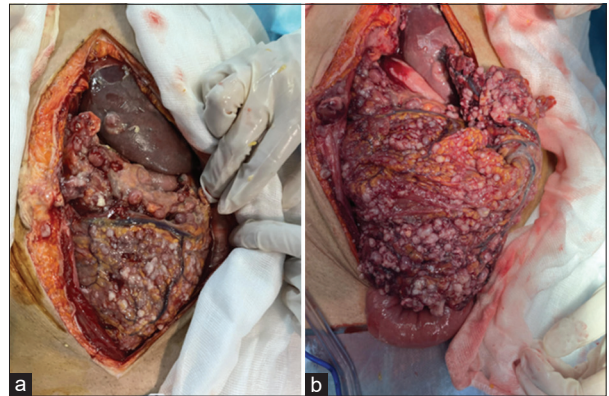


Figure 2: (a and b) Intraoperative findings revealed a perforated gastric tumor with important contamination of the abdominal cavity and liver metastase

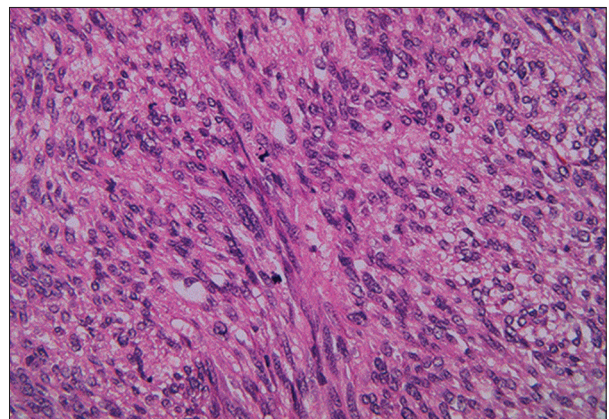


Figure 3: Histology analysis shows epithelioid cells with mild pleomorphism and abundant eosinophilic cytoplasm

factors such as the thicker gastric wall, earlier symptom recognition, and easier access to endoscopic evaluation, all of which may contribute to earlier diagnosis and reduced risk of rupture [2].

The differential diagnosis of an acute abdomen with pneumoperitoneum is broad and includes perforated peptic ulcer, perforated gastric carcinoma, complicated diverticulitis, intestinal tuberculosis, and small bowel obstruction due to ischemia or strangulation [6,7]. These entities often present with overlapping clinical features such as sudden abdominal pain, guarding, and peritoneal signs. Imaging can help distinguish these, but tumor perforation remains a rare consideration. In our case, the irregular, exophytic gastric mass with central necrosis, absence of a history of peptic ulcer disease or non-steroidal

anti-inflammatory drugs use, and the presence of liver metastases raised the suspicion for a neoplastic etiology. The definitive diagnosis of GIST was confirmed through histopathology and immunohistochemistry.

Surgical treatment of GIST depends on tumor size, location, and patient condition. Complete excision with wide margins is preferred, while regional lymph node removal is typically unnecessary due to rare nodal metastases. Chemotherapy is generally ineffective. In cases with peritoneal or liver metastases, complete resection of metastatic lesions may improve survival [8]. The mortality rate following spontaneous perforation of the small bowel or stomach remains high, exceeding 25% [9].

While spontaneous perforation is more commonly associated with small intestinal GISTs, a few isolated cases of gastric GIST rupture have been reported. In one case, Ajduk *et al.*, described a jejunal GIST mimicking appendicitis [3]; similarly, Cavaliere *et al.*, documented a gastric GIST presenting with acute abdomen [4]. However, most of these cases survived postoperatively, in contrast to our patient, who died within 24 h, likely due to tumor burden and hepatic metastases at diagnosis.

CONCLUSION

Although rare, tumor perforation can be the initial manifestation of a gastric GIST. Prompt recognition and a multidisciplinary approach are essential to reduce morbidity and mortality and to improve patient outcomes in such atypical presentations.

AUTHORS' CONTRIBUTION

All authors had full access to the data, contributed to the interpretation of findings, and participated in drafting and revising the manuscript. All authors approved the final version for submission. Conception and design of

study: Mortadha Boukhchim, acquisition of data: Bochra Rezgui and Aymen Mabrouk, drafting the manuscript: Oumayma Fatnassi, and revising the manuscript critically for important intellectual content: Oumayma Fatnassi and Mounir Ben Moussa.

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