Nontraumatic Hemoperitoneum Due To Spontaneous Gastrointestinal Stromal Tumor Rupture: a case report

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This study describes the case of a previously healthy 51-year-old male patient who complained of sudden abdominal pain. Physical examinations revealed overt peritonitis, and computed tomography showed a hypervascular solid tumor with massive hemoperitoneum. Gastrointestinal stromal tumor (GIST) rupture was highly suspected. Emergent laparotomy with surgical resection of the tumor was performed and the patient was discharged home uneventfully on the 17th postoperative day. The immunohistochemical characteristics of the tumor revealed it to be a gastrointestinal stromal tumor.

A gastrointestinal stromal tumor (GIST) is a rare mesenchymal tumor of the small bowel that is exophytic in most cases. The clinical symptoms of GIST range from mild to severe, and complications include vague abdominal pain, hematemesis, and intestinal obstruction. However, overt peritonitis caused by GIST rupture is very uncommon. This paper describes the clinical course of acute abdomen caused by a rare case of ruptured exophytic small bowel GIST.

CASE REPORT

A 51-year-old man with no history of abdominal trauma was admitted to the emergency department (ED) for vague abdomen pain. He reported a sudden onset of diaphoresis with near syncope 2 hours before visiting our ED. He denied nausea, vomiting, changes in bowel habit, or weight loss. His medical and family histories were unremarkable. His body temperature was 36.7°C. His blood pressure was initially 162/83 mmHg, but this dropped to 92/60 mmHg after 30 minutes. After fluid challenge with 2 liters of normal saline, his BP returned to 110/73 mmHg. Auscultation indicated clear lungs, and cardiac examination demonstrated no murmurs, rubs, gallops, or crunch. Physical examination revealed that the abdomen was distended, with diffuse tenderness and rebound tenderness. Abdominal ultrasonography revealed the presence of moderate ascites.

Blood analysis revealed a white blood cell count of 12200/μL and a platelet count of 292000/μL. Laboratory tests for hemoglobin, blood glucose, electrolytes, urea, creatinine, and amylase were normal, as were the liver function tests. A 64-slice multi-detector computed tomography (MDCT) (Toshiba Aquilion, Japan), helical, 5-mm-collimated sections from the diaphragm to the pubic symphysis was obtained. A total of 80 milliliters of non-iodinated
contrast medium (Omnipaque 300 mg I/ml) was injected through an antecubital vein. Contrast enhancement MDCT revealed massive hemoperitoneum (Fig. 1) and a dilated jejunum with mucosal enhancement (Fig. 2). Figure 3 shows a large solid tumor in the pelvic cavity surrounded by high attenuation blood in the peritoneal cavity, indicating tumor rupture. We suspected the patient’s condition to be peritonitis induced by organ rupture and decided to perform an emergency laparotomy under general anesthesia.

The subsequent operation removed a large ruptured small bowel tumor measuring about 10 \( \times 10 \times 8 \) cm via wedge excision. A total of 1600 ml of blood with blood clots was evacuated from the abdominal cavity. Histopathological and immunohistochemical reports indicated that the tumor was strongly and diffusely positive for CD117 and CD34, respectively, partially positive for smooth muscle actin, and totally negative for the S-100 protein. These findings support the diagnosis of a gastrointestinal stromal tumor (GIST). The patient recovered well without postoperative complications and was discharged on the 17th postoperative day.

**DISCUSSION**

A gastrointestinal stromal tumor (GIST) is a rare mesenchymal tumor of the digestive tract, omentum, and mesentery with an incidence estimated between 10 and 20/106 people annually. It occurs throughout the GI tract, from the lower esophagus to the anus. The most common site is the stomach (50%), followed by the small bowel (25%), colorectum (10%), and duodenum (3–5%) [1, 2]. Primary tumors are typically exophytic (79%), larger than 5 cm (84%), and inhomogeneously enhanced on CT scans (84%) [3]. Metastatic seeding mostly occurs to the peritoneal cavity and liver, followed by lungs and bones. A lymph nodal spread is rare, and a formal lymph node dissection has no proven value [4, 5]. Differential diagnosis can be performed using immunohistochemical markers such as KIT, CD34, ACAT2, S100, DES, and keratin [6]. The presence of KIT protein (CD117), a transmembrane receptor linked to an intracytoplasmic tyrosine kinase, is the classic finding for GIST, and 95% of all cases are CD117-positive [4, 7].

Because of their high vascularity, GISTs are frequently associated with gastrointestinal bleeding and have been associated with severe gastrointestinal hemorrhaging, requiring either embolization or emergency surgery. Our case study suggests that GIST should be considered when acute nontraumatic hemoperitoneum is present, particularly if CT detects a heterogeneous mass with high vascularity.

A large proportion of GISTs (about 60%) are symptomatic, with hemorrhaging being the most common presenting sign, followed by occlusion, pain, and perforation [8]. The clinical presentations of GIST are highly variable and depend on the size and location of the tumor. These X include melena associated with gastrointestinal bleeding, anemia...
Gastrointestinal stromal tumor presenting as hemoperitoneum

for ulceration of the overlying mucosa, a palpable mass, nausea and vomiting, abdominal pain, and rarely, peritonitis associated with spontaneous tumor rupture, as in this case [5, 9, 10]. Helical computed tomography plays an important role in the diagnosis and identification of intraluminal or exophytic tumors [11]. The differential diagnosis of GI tract tumors should include fibromatosis, leiomyoma, schwannoma, inflammatory fibroid polyp, and leiomyosarcoma [12]. In most cases, strong positivity is observed for KIT (CD117) (about 95%) and CD34 (about 70%) [4]. Therefore, positive results for these proteins in immunohistochemical examinations help establish the diagnosis.

Surgical resection is the mainstay localized GIST [13]. This is because GIST is more resistant to chemotherapy and radiotherapy than other GI tract tumors [14]. Previous research shows that the 5-year survival rate of patients with GIST is 54% [13]; the median survival rate of those who underwent complete resection was 66 months, while those who underwent incomplete resection or whose tumor was unresectable was 22 months [13]. Targeted therapy using the tyrosine kinase inhibitor imatinib—a novel adjuvant treatment administered after surgery—increases survival, suppresses tumor growth, and has moderate toxicity [15].

CONCLUSION

GIST is a rare visceral sarcoma that occurs predominantly in the gastrointestinal tract. While the clinical symptoms of this tumor vary depending on the tumor size and location, they can include abdominal pain, nausea and vomiting, gastrointestinal bleeding, and peritonitis due to tumor rupture [9]. This study reports a rare case of GIST, which presented as hemoperitoneum. GIST should be considered if a CT scan reveals a heterogeneous mass with high vascularity. The immunohistochemical characteristics of the tumor can help determine if it is a GIST or other GI tract tumor. Surgical resection is the standard treatment for a localized GIST, while imatinib therapy is a novel adjuvant treatment administered after surgery or in the case of advanced GIST [15].

REFERENCES


Figure 3. Axial CT image of the pelvic cavity shows a large mass (CT number 59) about 10 cm in diameter (white arrow) that is surrounded by bloody ascites (black arrows).
自發性的胃腸道間質腫瘤破裂引發非創傷性腹腔積血：病例報告

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我們敘述一位 51 歲先前健康的男性病患，抱怨忽然發生的腹痛，理學檢查發現有明顯腹膜炎之症狀，而腹部電腦斷層檢查則顯示有一高血管性之實質腫瘤，且同時發現大量的腹腔積血，胃腸道間質腫瘤被高度懷疑。而經緊急開腹手術及腫瘤切除後，病人於開刀 17 天後順利出院，腫瘤免疫組織化學特性則證實是胃腸道間質腫瘤。