Perforated GIST of the Small Intestine as a Rare Cause of Acute Abdomen: Surgical Treatment and Adjuvant Therapy. Case Report

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Abstract

A case of perforated gastrointestinal stromal tumor (GIST) of small intestine causing acute abdomen is described, with a brief review of the literature. A male patient presented with symptoms of acute abdomen. After evaluation, a laparotomy was performed, where perforation of a tumor in the ileum was found. The perforated part along with the tumor was resected and the cytopathological examination showed that the tumor was GIST. Postoperatively, the patient received treatment, using imatinib.

Gastrointestinal stromal tumors are relatively rare and often present with vague symptoms. Their first clinical manifestation as acute abdomen due to their perforation is extremely rare. In emergency laparotomy, a R0 resection is required and adjuvant therapy with imatinib must be considered.

Key words

Acute abdomen – perforation - gastrointestinal stromal tumors (GISTs) - imatinib

Introduction

Gastrointestinal stromal tumors (GISTs) are rare, although they are the most common mesenchymal tumors of the gastrointestinal tract. It is estimated that the frequency of these tumors is 10-20/1,000 000 population (1,2) and the possibility of presence of malignancy is 20-30% (3).

GISTs have a wide range of malignancy degree and it is preferable that they be considered and treated as potentially malignant (1,4). Small tumors that are completely resected and are of intermediate malignancy seldom create post-operative complications, while larger tumors may reccur after resection, or present with intraperitoneal infiltration or hepatic metastases.

Prognosis is worse in perforated GISTs and in these cases the attempt for complete surgical resection of the tumor must be followed by adjuvant therapy with imatinib.

We present the case of a patient, who presented with a picture of acute abdomen resulting from a perforated tumor of the small intestine.

J Gastrointestin Liver Dis
September 2006 Vol.15 No.3, 297-299
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Case presentation

A 66-year-old male patient presented with diffuse abdominal pain lasting for 10 hours, vomiting, abdominal distention and body temperature of 37.6° C. Acute abdomen was diagnosed and he was admitted to the Surgical Department. The laboratory tests showed only elevated white blood cell (WBC) count and the imaging examinations (upright chest and abdominal radiograph and transabdominal ultrasonography) showed no abnormalities. The patient had a personal history of two episodes of upper gastrointestinal hemorrhage (two years and one year before) that were treated conservatively. Radioimaging and endoscopic examination of the upper gastrointestinal tract showed no abnormal findings by that time.

A laparotomy was urgently performed, revealing diffuse peritonitis caused by a perforated small intestinal tumor of maximum diameter of 7-8 cm (Fig.1). The tumor together with about 13 cm of the ileum were extirpated, and regional lymph node excision and enteroenteroanastomosis were performed. A search of the entire gastrointestinal tract and the peritoneal cavity did not reveal other abnormalities. The patient had a postoperative course without complications and was discharged from the hospital on the 8th post-operative day.

Cytopathological examination of the tumor revealed a solid neoplastic mass sized 7×5×4 cm with a locus of melting of the surface (perforation site of 1.5 cm diameter) and the microscopic examination of the tumor showed two mitotic counts /HPF. The resected lymph nodes had no alterations

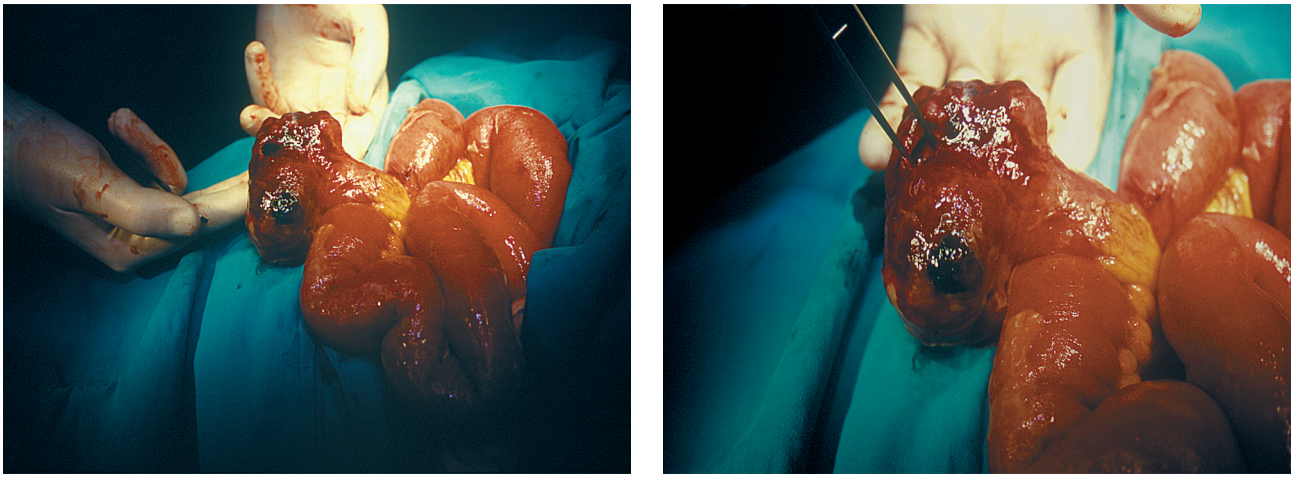

Fig.1 a, b. Perforated small-intestinal stromal tumor.

such as of infiltration. Further examination, using immuno-histochemical techniques, was positive for the surface antigens vimentin, a-smooth muscle actin, bcl-2, proto-oncogene KIT, CD34 and S100 protein, thus suggesting the diagnosis of GIST of the small intestine.

Postoperatively, the patient was treated by oral administration of 300 mg twice a day of imatinib for one month, a dose that was reduced to 200 mg twice a day because of the occurrence of a side effect (swollen eyelids). Medical treatment was continued for twenty months without any other complications and the patient was subjected to regular follow-up without any signs of recurrence of the disease (44 months after the operation).

Discussion

GISTs typically occur in patients around the sixth decade of life and can be found in any site of the gastrointestinal track (1,3,5,6). Small sized tumors (<2 cm) are usually asymptomatic, and are discovered incidentally, while larger lesions present as large abdominal masses, with or without clinical manifestations. The symptoms and signs are not disease-specific (1,3,7) and as a consequence about 50% of GISTs have already metastases at the time of diagnosis, usually to the liver or the peritoneum (1,8,9).

Although the diagnostic procedure includes several examinations, such as barium examination of the gastrointestinal track (10), computer tomography (6) and angiography (11), none of them can establish the correct diagnosis with 100% certainty. The preoperative percutaneous fine needle aspiration of the tumor for diagnostic purpose is not indicated because of the danger for potential intraperitoneal migration or tumor rupture (1). Recently, several studies pointed out the significance of endoscopic ultrasound-guided fine-needle aspiration for the diagnosis of GIST with a reported accuracy of 89% (12). On the other hand, positron-emission tomography (PET) with 18F-fluoro-2-deoxy-D-glucose is a very useful tool for the postoperative follow-up of patients receiving imatinib (13).

GISTs can be categorized as low or high-risk tumors by taking into account the possibility of metastasis or recurrence (4,14). However, the main prognostic factor is the mitotic count. A prognostic classification was defined by Fletcher et al and is widely accepted and used today (Table I) (15).

Table I GISTs classification by Fletcher et al (15)

Risk of malignancy	Size of tumor (cm)	Mitotic counts (/50HPF)
Very low	< 2	< 5 / 50
Low	2 – 5	< 5
Intermediate	< 5	6 – 10
	5 – 10	< 5
High	> 5	> 5
	> 10	Any counts
	Any size	> 10

Immunohistochemical examination of GISTs is always positive for KIT protein (CD117 antigen), while the positivity regarding other markers varies (Table II) (1,3,4,16,17).

Table II Proportion of GISTs positivity for various immuno-histochemical markers

Marker	Positivity
KIT	100%
CD34	70%
SMA	20-30%
S100	10%
Desmin	<5%

The treatment of choice for GISTs is the surgical excision of the tumor. All tumors must be completely resected (R0 resection), where possible, including the tissues that are infiltrated, while systemic lymph node dissection is not recommended by many authors (18,19). Complete surgical resection is connected with 48-65% five-year survival. Partial resection must only be performed in case of large tumors, for palliative purposes or for the control of symptoms or complications such as compression of other organs, hemorrhage, or pain (1).

The prognosis is dismal when the tumor presents with symptoms or signs such as perforation, multifocal location or metastatic lesions. Patients with localized or locally advanced tumors have 46% five-year survival, in contrast to patients with metastatic tumors or multifocal tumors in whom the five-year survival is 0%. Perforation of the tumor lowers the five-year survival to 24%, probably due to peritoneal dissemination (20). These patients have a similar evolution as patients with incomplete tumor resection, with shorter disease-free survival and mean survival of 17 months (19).

GIST response to conventional chemotherapy is very poor (<10%), while radiotherapy is only used in cases of intraperitoneal hemorrhage, when the precise location of the tumor is known, or for analgesic purposes (1,4,19).

The substance STI571, which has been named imatinib, was found to act as a powerful selective inhibitor of tyrosine-kinases (c-ABL, bcr-ABL), of PDGFR receptor (platelet-derived growth factor receptor) and of c-kit receptor. Imatinib is well tolerated by oral administration, and the suggested efficient dosis must be >300 mg per day to achieve curative results (1,21).

The first clinical studies demonstrate that imatinib is the first effective treatment for non-resectable or metastatic GISTs, whereas long-term results are still not extracted because of the short time of use (1). Further clinical studies are designed, studying the use of imatinib both preoperatively and postoperatively (1, 5).

Conclusions

Patients with GISTs have limited treatment options. Complete surgical resection without extensive lymph node sampling is still the primary treatment option, but even this has resulted in poor outcome and recurrence. Patients with complications such as perforated tumors, metastatic tumors and locoregional recurrence have an even worse outcome. Prior to the advent of imatinib, systemic treatments were largely ineffective. Although adjuvant and neoadjuvant therapies with imatinib are still investigational, it has considerable activity in patients with advanced disease such as perforated tumors and should thus be considered as an adjuvant to surgery.

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