

Clinical Treatment and Nursing Care of Gastrointestinal Stromal Tumor Acute Abdomen

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ABSTRACT

AIMS: Recently, the further understanding of gastrointestinal stromal tumor (GIST) and development of diagnosis and treatment methods have led to an increase in diagnosed cases. Patients may present with acute abdomen, perforation or peritonitis, and acute intestinal obstruction. This work aims to investigate the clinical treatment and nursing methods of GIST patients with an acute abdomen symptom.

METHODS: A retrospective analysis was conducted for the treatment and nursing care of 45 GIST cases, in which the primary symptom was acute abdomen. The patients were admitted at the General Surgery of Sichuan University from January 2008 to January 2011.

RESULTS: A total of 45 GIST patients (28 males and 17 females) were involved in the research, which included 29 stomach tumor cases (64.4%), 11 small intestine-related cases (24.5%), 3 colon-related cases (6.7%), and 2 rectum-related cases (4.4%). Among these cases, 11 were diagnosed with acute intestinal obstruction (24.5%), 27 with acute gastrointestinal hemorrhage (60.0%), and 7 with abdominal hemorrhage caused by tumor rupture (15.5%); 41 cases underwent surgical treatment, improved after perioperative

care, and were subsequently discharged from the hospital; another 4 cases with advanced tumors were treated with oral imatinib mesylate as neoadjuvant therapy, which eventually led to a partial relief.

CONCLUSIONS: No clinical specificity regarding GIST exists. Thus, GIST is prone to misdiagnosis and/or missed diagnosis. Early diagnosis and treatment increase the prognosis of patients. The integrity of the treatment and nursing care can effectively and safely help patients during the perioperative period.

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Key words: Acute abdomen; Gastrointestinal stromal tumors; Diagnosis; Treatment; Nursing care

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INTRODUCTION

Gastrointestinal stromal tumor (GIST) was initially proposed by Mazur *et al*^[1] in 1983. GIST is a common mesenchymal tumor in the gastrointestinal tract and originates in the Cajal cells on the gastrointestinal wall or homologous mesenchymal stem cells^[2]. GIST is more common in middle-aged and older people and is slightly more common in males^[3]. Throughout the whole alimentary tract, GIST most commonly starts in the stomach followed by the small intestine, but GIST also starts in other sites of the gastrointestinal tract. Nonspecific abdominal pain and gastrointestinal hemorrhage are the most frequent symptoms in GIST patients^[4].

Given the insignificant clinical specificity, the clinical manifestations of GIST greatly differ when the tumor progresses, and the sites and pathological types vary. Currently, surgery is still

the first choice for patients. In this research, we analyzed the clinical data and nursing care of 45 GIST acute abdomen patients to provide an effective and safe perioperative management for GIST acute abdomen patients.

MATERIALS AND METHODS

Patients' selection

Inclusion criterion: (1) All the patients were pathologically and immunohistochemically diagnosed with GIST; (2) The first clinical manifestation was acute abdomen (stomach ache, gastrointestinal hemorrhage, and acute peritonitis); (3) All the patients had no medical history of other malignant tumors. From January 2008 to January 2011, the Department of General Surgery in our hospital handled 45 cases of GIST acute abdomen, including 28 males and 17 females; the median age was 56 (ranging from 35 to 80) years old at diagnosis. The primary tumor sites were the stomach (29 cases, 64.4%), small intestine (11 cases, 24.5%), colon (3 cases, 6.7%), and rectum (2 cases, 4.4%) (The details are shown in Table 1).

Surgery and medication

All the patients underwent abdominal CT scan or B-ultrasound before surgery. Laparotomy was conducted under general anesthesia, and the surgical methods depended on the intraoperative exploratory results. Given that most of the patients were not diagnosed with GIST before the surgery, we followed the following surgical principles: (1) tumors are resected as completely as possible, and tumor rupture is avoided; (2) lymphadenectomy surgically found will be dissected; and (3) after incisional margins were surgically confirmed as negative, alimentary canal is reconstructed. The resected tumor specimens were routinely pathologically examined. Referring to the risk classification of the National Institutes of Health^[5], the medium- and high-risk patients were treated with imatinib as the adjuvant therapy. The recommended dose was 400 mg/d, and 600 or 800 mg/d for the patients with a progressing tumor. Complete surgical tumor resection was difficult in four cases, as the tumors of these cases were infiltrated with the surrounding tissues. Conservative treatments helped improve the patients' conditions. According to the National Comprehensive Cancer Network guidebook^[6], abdominal B-ultrasound or biopsy with the guidance of CT scan can verify GIST, and oral imatinib mesylate was advised as neoadjuvant therapy. During the post-operative follow-up, all these four patients partially responded to the treatment.

Pre-operative nursing care

Changes in patient conditions were carefully observed after admission, and the communication among the doctor, patients, and nurses were conducted simultaneously with related examinations. The patients were unavoidably assailed for the acute onset. Thus, appropriate psychological comfort helped these patients coordinate with the doctors and inform the doctors as soon as the patients' conditions changed for timely treatment. Active pre-operative preparation was also needed, which included helping in changing the patients' clothes and in cleaning the patients, undergoing antibiotic allergy tests, and preparing the patients' gastrointestinal tract for the operation. The patients with acute intestinal obstruction and intra-abdominal inflammation followed the doctors' instructions and underwent anti-inflammatory rehydration and gastrointestinal decompression to relieve the gastrointestinal obstruction; for the patients with acute gastrointestinal hemorrhage and abdominal hemorrhage, which resulted from tumor rupture, intravenous access

Table 1 Patients' main clinical characteristics.

Variables	No. of patients (n=45)	Percentage (%)
Gender		
Female	17	37.8
Male	28	58.2
Age (years)		
Median	56	-
Range	38-80	-
Primary tumor location		
Stomach	29	64.4
Small intestine	11	24.5
Colon	3	6.7
Rectum	2	4.4
Clinical presentations		
Intestinal obstruction	11	24.5
Alimentary tract hemorrhage	27	60.0
Rupture and intraperitoneal bleeding	7	15.5
Risk of recurrence		
Low	6	13.3
Intermediate	18	40.0
High	21	46.7
Tumor size (cm)	8.24±3.26	-

was rapidly used to prevent shock. While the blood volume of the patients was being replenished, emergency surgery was prepared.

RESULTS

Clinical presentations and diagnosis

A total of 11 cases had acute intestinal obstruction, which accounted for 24.4% of the total patients. These patients experienced abdominal pain, abdominal distention, nausea, and vomiting and had an obvious abdominal mass. The physical examination showed abdominal protuberance, which is an obvious touchable abdominal mass, or visible intestinal and peristaltic waves. By contrast, the auscultation indicated an enhanced bowel sound. The CT scan of the entire abdomen indicated intraperitoneal space-occupying lesion, heterogeneous enhancement of tumors with a clear boundary, and an obvious gas-liquid level. Considering the medical history and abdominal CT scan results, 2 cases were regarded as GIST. Fig. 1(AB) suggests a lower left abdominal intussusception, which is considered as GIST.

A total of 27 cases had acute gastrointestinal hemorrhage, which accounted for 60.0% of the total cases. The clinical manifestation was melena or bloody stool, which was accompanied with or without a history of syncope or anemia. The electronic gastroscopy of 14 cases showed ulcer and neoplasm formation, which bled when touched. No unusual findings were found from the colonoscopy of 6 cases. The CT scan and enhanced CT scan of 16 cases indicated an abdominal mass; an irregular low density shadow, but still with a clear boundary; and a heterogeneous enhancement after the enhanced CT scan. The CT scan results suggested 4 GIST cases. Figure 1(CD) shows the GIST gastrointestinal hemorrhage.

A total of 7 cases had abdominal hemorrhage that resulted from tumor rupture, which accounted for 15.6% of the total cases. The clinical manifestations were sudden continuous whole abdominal pain without an obvious incentive, followed by dizziness, accelerated heart rate, paleness, decreased blood pressure, and other symptoms of acute hemorrhagic shock. The abdominal B-ultrasound and CT scan suggested ascites and hemocele in various degrees. Figure 2 indicates 1 case of abdominal hemocele, which was caused by tumor rupture.

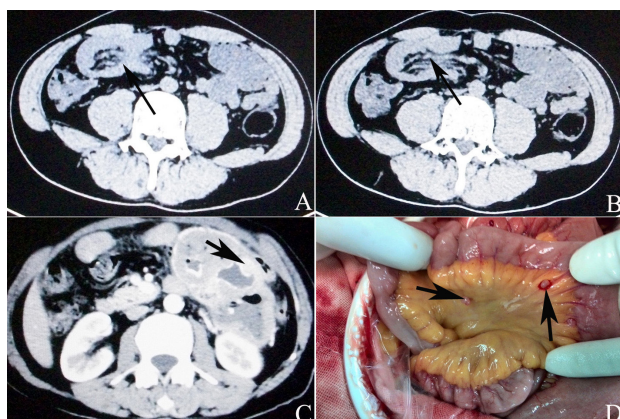


Figure 1 (AB), the abdominal CT scan image indicates that in the lower right abdomen, the intestinal wall significantly thickened and layered, whereas partial mesangial cells and fat were found in the abdomen, as shown by the arrow. C shows the thick proximal jejunum wall, which is up to 4 cm in the thickest part; an unclear boundary with surrounding tissues; and a highly dense visible shadow at the coelenteron, which is mostly blood. Intra-abdominal metastasis was found during surgery. D shows small multiple mesenteric metastases.

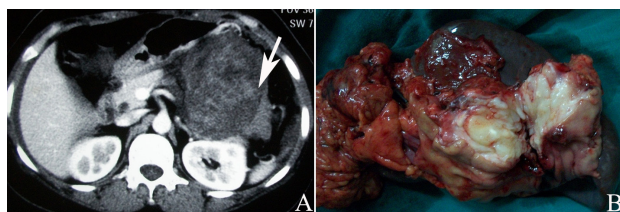


Figure 2 (A), the enhanced abdominal CT scan indicated a lump with a size of 9.1 cm × 6.9 cm in the gap between the left spleen and the stomach, with a slightly high density shadow in the central and peripheral tumor, which was mostly blood. In 2 (B), after surgical resection, it shows the tumor has an unclear boundary with the spleen.

Surgical treatment

A total of 41 cases underwent surgery. The intraoperative exploratory results confirmed the tumor size, morphology, and sites, which led to the surgical methods. A total of 37 cases had complete tumor resection (no visible residual lesion and no residual tumor cells on the gastrointestinal cutting edge), including 2 cases with tumors that involved the surrounding organs (which were mainly spleen-related, as shown in Figure 2B) and 4 cases with palliative resection, which included 2 cases with distant metastasis (liver and peritoneum). In addition, 2 cases underwent total gastrectomy; 23 cases underwent subtotal gastrectomy; and 2 cases underwent gastric wedge resection. Ten cases with small intestinal stromal tumors had small intestinal segmental resection and intestinal anastomosis; 3 cases with colon stromal tumors had segmental resection; and 1 case with rectal stromal tumor had segmental resection and proximal colostomy (refer to Table 2 for the details).

Post-operative care

After the surgery, the doctors and nurses cooperated according to the different surgical methods, aiming to comfort and help the patients with the early post-operative recovery. The patients were also assisted to be more mobile post-surgery, which made the patients feel more comfortable, shortened the patients' hospital stay, and relieved the stress on limited medical resources. An effective specialist nursing care included the following: incision treatment (special team for incision dressing), intravenous infusion, and health education seminars, which were beneficial for the patients' recovery. The nurses

Table 2 Surgical information (n=41).

Variables	No. of patients	Percentage (%)
Stomach (27)		
Total gastrectomy	2	4.9
Subtotal gastrectomy	23	56.1
Wedge resection	2	4.9
Small intestine and colon (13)		
Partial bowel resection	13	31.7
Rectum (1)		
Rectum resection + colostomy	1	2.4
Postoperative bowel obstruction	2	4.9
Multivisceral resection		
Anastomotic bleeding	0	0
Anastomotic leakage	0	0
Abdominal/wound infection	3	7.3

also followed up and guided the patients for medication to increase the patients' medication compliance postoperatively.

DISCUSSION

GIST is prevalent among middle-aged and older people; GIST was observed in few patients who are younger than 40 years old, and some rare cases exist in children^[7]. The incidence of GIST is around 1/105–2/105. GIST has no specific clinical manifestations, and the symptoms of GIST are mostly related to the tumor size and site^[8]; thus, clinical diagnosis is difficult. When the tumor is small, no symptoms usually exist, but when the tumor grows, gastrointestinal symptoms start to manifest. Numerous previous publications found that the most common symptoms of GIST are gastrointestinal hemorrhage (50%), abdominal pain (20%–50%), and intestinal obstruction (10%–30%), but in some cases, no symptoms are found^[9]. Consistent with their findings, among the 45 GIST cases in the present study, 11 had acute intestinal obstruction (24.5%), 27 had acute gastrointestinal hemorrhage (60%), and 7 had abdominal hemorrhage that resulted from tumor rupture (15.5%). Given the unfamiliarity of GIST, misdiagnosis is common, which delays the best treatment time and even leads to death. Therefore, GIST diagnosis should be considered during the work up of patients with acute abdomen symptoms. A timely advice for abdominal discomfort treatment or for periodic medical examinations is significant for the early diagnosis of GIST.

The clinical manifestations of GIST are related to the tumor size, growth progress, and site. GIST may start in any part of the gastrointestinal tract. In the GIST cases of this group, 29 cases started in the stomach (64.4%), 11 cases in the small intestine (24.5%), 3 cases in the colon (6.7%), and 2 cases in the rectum (4.4%), which is consistent with the report of Sorour *et al*^[10]. As the tumor grows, stromal tumors are frequently accompanied with ulcers and hemorrhage. Some intestinal or intraperitoneal stromal tumors easily obstruct or stress the intestine, resulting in intestinal obstruction as the major clinical manifestation. These patients are easily misdiagnosed with obstruction or ischemic acute abdomen. When the tumors are close to the gall bladder, duodenum, and pancreas, the symptoms are found in the corresponding parts, such as abdominal fullness and discomfort, obstructive jaundice, and mesenteric vascular compression ischemia. GIST perforation is few, but not rare. Partial perforation is possibly caused by the invasion of cancerous swelling on the gastrointestinal wall, which progresses; by the obstruction of cancerous swelling that forms in the intracavity high pressure; or by the accompanying tumor necrosis with infection that results from insufficient blood supply^[11–12]. GIST perforation may lead to intracavity tumor seedling and a reduction in the patients'

five-year survival rate. Thus, post-operative imatinib adjuvant therapy is especially important^[13]. Medium-risk patients are usually given at least one year of imatinib therapy, whereas for high-risk patients, the therapy is at least three years^[14-15]. The side effects of imatinib are mainly eyelid edema and a reduction in the number of white blood cells. Targeted drugs emerge for the treatment of advanced GIST patients whose tumors cannot be resected or completely resected.

In clinics, preoperative supplementary examination, which usually includes gastroscopy, CT scan, and barium meal, is necessary for patients with GIST acute abdomen^[16]. Abdominal CT scan or B-ultrasound can simply and rapidly display the abdominal conditions of patients with acute abdomen. Abdominal CT scan can show the tumor size; morphology; site; relation with surrounding organs; and distant metastasis and internal conditions of the tumor, such as necrosis, cystic degeneration, hemorrhage, and calcification. Abdominal CT scan is sometimes essential for deciding whether emergency surgery is required. According to the pre-operative abdominal CT scan results in this study, 6 cases were considered potential GIST (14.6%), which is lower than what was reported by Sorour *et al*^[10]. Gastroscopy can directly determine the focus of the GIST. If necessary, biopsy is used for diagnosis. In this group, 4 cases (8.9%) underwent pre-operative biopsy and were proven to have GIST. Thus, appropriate supplementary examination helps in improving the diagnosis rate of GIST acute abdomen and in avoiding misdiagnosis.

Surgical resection is still the first choice for treating GIST. In principle, tumors are resected as completely as possible, and cutting margins are guaranteed as negative^[17]. GIST is insensitive to conventional chemotherapy, and imatinib mesylate is a new option for GIST treatment. Both complete resection of tumors and post-operative imatinib can significantly increase the patients' survival period. As reported, the five-year survival rate of the GIST patients with tumors that were completely resected increased by up to 50%-64.5%^[10,18], whereas the application of imatinib increased the patients' two-year survival rate by 30%^[19]. Preoperative imatinib treatment, as a new treatment method, can reduce the tumor size, decrease the clinical stages, limit the surgical range, avoid unnecessary joint organ resection, and increase the change in radical resection^[20-21].

GIST specialists offer scientific perioperative management for patients with acute abdomen as the primary symptom. These specialists also carefully observe patients' clinical symptom changes, help patients on related examinations, and assist doctors with early diagnosis to avoid treatment delays. Post-operative nursing processes for a quick recovery, timely psychological comfort, follow-up on patient compliance with targeted drugs, and health education are also some of the supports provided for a safe and effective perioperative period.

In conclusion, GIST acute abdomen patients have no specific clinical symptoms. Thus, doctors should be attentive to acute intestinal obstruction, gastrointestinal hemorrhage, abdominal hemorrhage, and acute peritonitis. Active supplementary examination and early diagnosis and treatment help save patients' lives. However, we have no further detailed follow-up information about patients who underwent adjuvant therapy. Hence, for our future research, we will conduct a long-term follow-up to monitor the efficacy of the therapy and to evaluate the clinical effects.

CONFLICT OF INTERESTS

The authors declare that they do not have conflict of interests and received no financial support.

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