

• BRIEF REPORTS •

Clinical analysis of primary small intestinal disease: A report of 309 cases

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Abstract

AIM: To evaluate the major clinical symptom, etiology, and diagnostic method in patients with primary small intestinal disease in order to improve the diagnosis.

METHODS: A total of 309 cases with primary small intestinal disease were reviewed, and the major clinical symptoms, etiology, and diagnostic methods were analyzed.

RESULTS: The major clinical symptoms included abdominal pain (71%), abdominal mass (14%), vomiting (10%), melaena (10%), and fever (9%). The most common disease were malignant tumor (40%), diverticulum (32%) and benign tumor (10%). Duodenal disease was involved in 36% of the patients with primary small intestinal diseases. The diagnostic rate for primary small intestinal diseases by double-contrast enteroclysis was 85.6%.

CONCLUSION: Abdominal pain is the most common clinical symptom in patients with primary small intestinal disease. Malignant tumors are the most common diseases. Duodenum was the most common part involved in small intestine. Double-contrast enteroclysis was still the simplest and the most available examination method in diagnosis of primary small intestinal disease. However, more practical diagnostic method should be explored to improve the diagnostic accuracy.

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INTRODUCTION

Clinically, primary small intestinal disease is relatively rare. Accounting for only 1-4% of digestive diseases^[1]. In spite of the development of techniques in endoscopy and the innovation of equipments, such as capsule endoscopy^[2,3] and double-balloon push enteroscopy^[4,5], diagnosis of primary small intestinal disease is still difficult. For example, uncontrollability in the movement of endoscopic capsule, the influence of fluid inside gastrointestinal tract, poor discrimination in images and unavailability of biopsy decrease the practicability of capsule endoscopy in clinical practice^[6]. Theoretically, there is no blind region in total small intestine for double-balloon push enteroscopy, as the new instrument has been put into practice recently. However, it is almost impossible for double-balloon

push enteroscopy to search all small intestines through either mouth or anus. Furthermore, double-balloon push enteroscopy has other limitations, such as long time of examination and patients' prolonged endurance^[7]. Therefore, the diagnosis of primary small intestinal disease is still difficult. In this study, by clinical analysis of 309 cases of patients with primary small intestinal disease, we aimed to investigate clinical symptoms, etiology, and diagnostic methods in primary small intestinal disease in order to increase the knowledge in primary small intestinal disease and improve the diagnosis.

MATERIALS AND METHODS

Criteria for selected patients

All selected patients had clinical symptoms or signs of the digestive system. The diagnosis of small intestinal disease was confirmed by means of laparotomy, pathology and other examinations. Primary small intestinal disease included duodenal disease, jejunal disease and ileal disease. However, duodenal bulb ulcer was not included. Secondary small intestinal diseases were also excluded.

Method of analysis

A total of 309 cases with primary small intestinal disease were reviewed, and the major clinical symptoms, etiology, and diagnostic methods were analyzed.

RESULTS

From January 1976 to July 2003, 309 cases with primary small intestinal disease were collected. Among them, there were 167 males, 142 females, with age ranging from 2 to 87 years old, and an average age of 51.2 years.

Among the 309 cases, 216 cases were confirmed by surgical operations, 53 by double-contrast enteroclysis, 24 by gastric endoscopy or enteroscopy and biopsy and 16 by a combination of clinical and other examinations. Among the 216 cases with surgical operations, diagnosis could not be definitely made in 142 cases until laparotomy was performed. Lesions were found in 89 of 104 cases examined by double-contrast enteroclysis, giving a positive rate of 85.6%. The major clinical symptoms were abdominal pain, abdominal mass, vomiting, melaena, fever, hematochezia and diarrhea. Some cases had two or more symptoms (Table 1). The most common diseases were malignant tumor (40%), diverticulum (32%) and benign tumor (10%). Duodenal disease was involved in 36% of the patients with primary small intestinal diseases. The distribution of the major diseases of 309 cases is listed in Table 2.

Table 1 Major clinical symptoms of 309 cases with primary small intestinal disease

Symptom	n (%)	Symptom	n (%)
Abdominal pain	218 (71)	Hematochezia	19 (6)
Abdominal mass	44 (14)	Diarrhea	14 (5)
Vomiting	32 (10)	Jaundice	13 (4)
Melaena	30 (10)	Haematemesis	3 (1)
Fever	27 (9)	Others	8 (3)

Table 2 Distribution of major diseases in 309 cases with primary small intestinal disease

Disease	n (%)
Small intestinal diverticulum	100 (32)
Small intestinal adenocarcinoma	35 (11)
Small intestinal leiomyosarcoma	34 (11)
Small intestinal lymphoma	29 (9)
Crohn's disease	15 (5)
Small intestinal leiomyomas	13 (4)
Hemorrhagic necrotizing enteritis	13 (4)
Ampullar carcinoma	11 (4)
Small intestinal malignant mesenchymoma	11 (4)
Small intestinal polyp	10 (3)
Small intestinal twist	8 (3)
Small intestine multiple perforation	4 (1)
Terminal ileal ulcer	3 (1)
Small intestinal cavernous hemangioma	2 (1)
Small intestinal malabsorption syndrome	2 (1)
Small intestinal internal hernia	2 (1)
Small intestinal fistula	2(1)
Others ¹	15(5)

¹Including jejunal malignant melanoma, jejunal malignant angioendothelioma, ileal liposarcoma, small intestinal malignant reticulosis, small intestinal fibrosarcoma, jejunal lipoma, jejunal fibroma, jejunal neurofibroma, ileal neurilemmoma, small intestinal benign mesenchymaloma, small intestinal teratoma, small intestinal inflammatory pseudotumor, terminal ilealitis, eosinophilic enteritis and idiopathic small intestinal obstruction which had 1 case respectively.

DISCUSSION

Distribution of major diseases in patients with primary small intestinal disease

In this study, 216 (70%) of 309 cases were diagnosed as having primary small intestinal disease by a combination of surgical operations and pathology. In addition, 24 of 309 cases were diagnosed by a combination of gastric endoscopy or enteroscopy and biopsy. Therefore, a total of 240 (78%) cases were diagnosed by pathology. Based on the analysis of the characteristics of the diseases, we found that malignant tumor was the most common disease in primary small intestinal disease. Overall, 125 patients had malignant tumors, 35 (11%) with adenocarcinoma, 34 (11%) with leiomyosarcoma, 29 (9%) with small intestinal lymphoma, and 11 (4) with ampullar carcinoma. These patients accounted for 40% of the cases with primary small intestinal disease. There were only 32 (10%) cases with small intestinal benign tumor, mainly including 13 (4%) cases of small intestinal leiomyomas, and 10 (3%) with small intestinal polyps. The ratio of small intestinal benign over malignant tumors was almost 1:4 (32:125), which indicates that most of small intestinal neoplasms are malignant, and thus small intestinal malignant tumors contribute significantly to small intestinal disease. This finding is consistent with previous domestic reports by Liu *et al.*^[8] and Shi *et al.*^[9], but different from the oversea reports that small intestinal benign tumor is more common than small intestinal malignant tumor^[10]. Our observations suggest that malignant tumors should be considered if small intestinal disease is under consideration, and further examinations should be taken as soon as possible to assure or exclude small intestinal malignant tumor. In this way, patients with small intestinal malignant tumor would receive optimum management through the early diagnosis and early treatment strategy, and thus prognosis would be significantly improved.

Among the 309 cases, 100 had small intestinal diverticulum, which contributed to 32% of cases and was the second common diagnosis in small intestinal disease. Among patients with small intestinal diverticulum, 72 (72%) had duodenal diverticulum, and 28 (28%) had jejunal or/and ileal diverticulum, which indicates that duodenal diverticulum is much more common than jejunal or/and ileal diverticulum. The data suggest that more attention should be paid to duodenal diverticulum, especially diverticulum of descending part of duodenum because diverticulum in this site is not only common but also detectable easily by gastric endoscopy or barium meal examination.

In addition, 84 cases had other small intestinal benign disease, which contributed to 27% of patients with small intestinal diseases, mainly including 32 (10%) with small intestinal benign tumor, 15 (5%) with Crohn's disease, 13 (4%) with hemorrhagic necrotizing enteritis and 8 (3%) with small intestinal twist. These data indicate that small intestinal benign tumor is the most common disease among small intestinal non-diverticular benign disease. It is also noticed that 111 cases with duodenal diseases contributed to 36% of the 309 patients with primary small intestinal disease. There were 72 cases with diverticulum accounting for 65% of patients with duodenal disease, 37 with malignant tumor accounting for 33% of patients with duodenal disease, and 2 with duodenal polyps. Since the human small intestine is 5 to 6 meters long, and duodenum is only 0.25 meter long, which is not longer than 1/20 of full length of small intestine. However, more than one third of small intestinal diseases were duodenal diseases. Therefore, duodenum is the most common part involved in small intestinal disease, and special attentions should be paid to duodenal disease, especially between descending part and ascending part of duodenum when small intestinal disease is under consideration, because duodenum is not only commonly involved but also shallow enough to be easily detected by gastric endoscopy or a barium meal examination without need for other complex examinations.

Major clinical symptoms in patients with primary small intestinal disease

Clinical symptoms of primary small intestinal disease in this study included abdominal pain, abdominal mass, vomiting, melaena, fever, hematochezia, diarrhea, jaundice, haematemesis, marasmus, abdominal distension, and constipation. Among these symptoms, abdominal pain was the most common clinical symptom as 218 cases had abdominal pain, which contributed to 71% of cases with primary small intestinal disease. The site of abdominal pain was mainly located around the navel. The second common symptom was abdominal mass. Altogether 44 cases had abdominal mass, which contributed to 14% of cases with primary small intestinal disease. The other common symptoms were vomiting, melaena and fever. Fever was caused mostly by small intestinal lymphoma and hemorrhagic necrotizing enteritis. However, hematochezia, diarrhea, jaundice, haematemesis were less common. Hematochezia was often characterized by dark-red stool and negative findings by enteroscopy. Haematemesis was a rare symptom, but if it occurred, then the volume of bleeding would be enormous. Therefore, the symptoms of patients with primary small intestinal disease are lacking of specificity as these symptoms may occur in patients with upper digestive disease and colon disease. So small intestinal disease could not be diagnosed only by symptoms, which is also one of the reasons for the difficulty in the diagnosis of primary small intestinal disease. However, when patients had above mentioned symptoms, especially melaena, hematochezia, haematemesis and enteremphraxis, but no positive findings were found by gastric endoscopy and enteroscopy at the same time, further examinations should be

given to patients to verify or exclude small intestinal disease. These examinations include double-contrast enteroclysis, selective arteriography, small intestinal endoscopy, capsule endoscopy, and double-balloon push enteroscopy.

Examinations methods for the diagnosis of primary small intestinal disease

In spite of so many examination methods, how to select appropriate examinations is a question to be often asked in clinical work. We found that some patients were finally definitely diagnosed as having primary small intestinal disease through almost all the examinations, which not only put heavy economical burden on patients, but also increased suffering of patients, and especially delayed the diagnosis of disease. However, if an examination was correctly selected, the diagnosis could be easily achieved. Capsule endoscopy is nontraumatic method for the examination of small intestinal disease, however, uncontrollability in movement of capsule endoscopy, poor discrimination in images and unavailability of biopsy, expensive price, and time-consuming decrease the practicability of this method in clinical practice. The traditional enteroscopy can only observe the digestive tract 1 meter above jejunum to Treitz ligament due to itself limitation, which means that most of small intestinal could not be diagnosed by the traditional enteroscopy. Radiography includes selective arteriography and double-contrast enteroclysis. Selective arteriography is a useful examination for patients with main clinical symptoms of melaena, hematochezia or haematemesis. The diagnosis rate of selective arteriography is increased especially when a patient is bleeding^[11]. Otherwise, double-contrast enteroclysis is a very valuable examination for patients with main clinical symptoms of abdominal pain, abdominal mass, vomiting, or diarrhea. In this study, among the 309 cases with primary small intestinal disease, 104 cases were examined by double-contrast enteroclysis, and 89 cases were found lesion in small intestine, with a positive rate of 85.6%, which was similar to report by Wang *et al*^[12]. This positive rate is significantly higher than that (70%) reported by Zhan *et al*, based on the hospitalized patients in our hospital before 1997^[13]. The improvement of diagnosis accuracy may be related to the better choice made by doctors for examinations, the improved experience of examiners and more attention paid to small intestinal disease over the past 6 years. Unfortunately, only one third of cases with primary small intestinal disease were examined by double-contrast enteroclysis in this study. The reasons for this included unawareness of double-contrast enteroclysis by physicians, emergency that did not allow patient for double-contrast enteroclysis but for laparotomy and situations that patients had a complete or incomplete intestinal obstruction. In fact, patients with incomplete intestinal obstruction can be examined by double-contrast enteroclysis with meglucamine diatrizoate instead of barium by placing a tube into duodenum during gastric endoscopy, which could not only increase the diagnosis rate, but also be more available and safer for patients^[14]. Because some endoscopic capsules can not move out of body in some patients until laparotomy was performed, it is suggested that double-contrast enteroclysis should be performed before capsule endoscopy. By this way, doctors not only obtain primary knowledge if there is a matter

with patient, but also obtain the information of the intestinal movement, which would help determine whether capsule endoscopy is suitable for the patient and thus avoid the situation which endoscopic capsule can not naturally move out of the body^[15]. Double-balloon push enteroscopy has been applied recently to provide a powerful tool for diagnosis of small intestinal disease. Therefore, we would draw a conclusion from what mentioned above that as a traditional nontraumatic or microtraumatic examination, double-contrast enteroclysis has advantages in simplicity and availability, little torment, high diagnosis accuracy and low price. Therefore, at present, double-contrast enteroclysis still plays an important role in diagnosis of small intestinal disease. We are hoping that double-balloon push enteroscopy and other newer and more practical examinations could aid in diagnosis of small intestinal disease with the development of technology in endoscopy and general use of endoscopic equipment.

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