GASTROENTEROLOGY

Adult intussusception in Asians: Clinical presentations, diagnosis, and treatment

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Abstract

Background: Adult intussusception is a rare clinical entity. The presentations and optimal management of adult intussusception in Asians have seldom been reported. The purpose of this study was to determine the causes and management of adult intussusception in Taiwan.

Methods: A retrospective review performed at four medical centers in Taiwan identified 46 patients, at least 18 years old, with a diagnosis of intestinal intussusception from January 1992 to December 2005. Data related to presentations, diagnosis, treatment, and pathology were analyzed.

Results: There were 28 men and 18 women with a mean age of 58 (range 19–83) years. Twenty-five patients were diagnosed with enteric intussusception and 21 patients with colonic intussusception. Disease in 35 (76.1%) patients was caused by a benign lead point. The most common symptom was abdominal pain, which was seen in all patients. Twenty-five patients presented with acute symptoms that they experienced over a period of less than 3 days. The preoperative diagnosis was 89.1% because of the wide use of abdominal computed tomography (CT). The most sensitive diagnostic modality was abdominal CT (88.6%). For all patients, 76% with enteric intussusception and 28.6% with colonic intussusception underwent operative reduction. At the time of writing, 71.7% patients were still alive. Only two patients died of postoperative complications.

Conclusions: Most patients with adult intussusception in our series were men, and most intussusceptions were benign and of enteric origin. The most sensitive diagnostic modality is abdominal CT scan. Operative reduction is recommended for enteric intussusceptions but not for colonic intussusceptions. The prognosis of adult intussusception after surgery is good except for malignant intussusception.

Introduction

Intestinal intussusception in children is a common disorder; however, it is a rare clinical entity in adult patients. Adult intussusception represents 5% of all cases of intussusception and only 1–5% of intestinal obstruction.[1,2] Most cases of adult intussusception are caused by an identifiable lead lesion and are treated by surgery.[2,3] In children, it is usually primary and benign, and pneumatic or hydrostatic reduction of the intussusception is sufficient to treat the condition in 80% of patients. In adults, a diagnosis of intussusception is often difficult, and the intussusception is not often found before a laparotomy.[4] Demonstrable etiology is found in 70–90% of cases of adult intussusception, and approximately 40% of them are caused by a primary or secondary malignant neoplasm.[4–6]

Most surgeons consider that surgical resection is required for adult intussusception. However, reduction before resection remains controversial. In addition, most reports are from Western countries, and only a few reports with a few cases have been published in Asian counties.[7,8] Therefore, we report our experience in an attempt to clarify the cause, clinical features, diagnosis, and management of this uncommon entity.

Methods

A retrospective review of the records of four Taiwanese hospitals – Taipei Medical University Hospital, Taipei Medical University Wan-Fang Hospital, Zhongxiao Branch of Taipei City Hospital (all in Taipei), and Changhua Christian Hospital (in Changhua) – from

Table 1 Demographic data of patients with intestinal intussusception

Characteristic	n
Total patients	46
Mean age (years) (range)	58.2 (19–83)
Sex (male: female)	28:18
Enteric	
Benign	22
Malignant	3
Colonic	
Benign	13
Malignant	8

Table 2 Symptoms and signs of patients with intussusception (*n* = 46)

Symptoms and signs	n (%)
Nausea/vomiting	24 (52.2)
Abdominal pain	46 (100)
Constipation/diarrhea	8 (17.4)
Bloody stool	8 (17.4)
Coffee-ground vomitus	2 (4.3)
Fever/chills	3 (6.5)

January 1992 to December 2005 identified 49 patients, who were at least 18 years old, with a diagnosis of intussusception. Data were gathered from patients' charts, operative notes, and pathology reports. Patients with stomal, gastroenterostomic, or rectal prolapse intussusceptions were excluded.

We divided patients into two groups: enteric intussusceptions and colonic intussusceptions. Enteric intussusception was considered if the lead point (intussusceptum) and distal bowel lumen (intussuscipiens) solely involved the jejunum or ileum. Intussusception caused by a lesion that involved the ileum and cecum was designated as colonic intussusception. All lesions were subdivided into benign and malignant categories according to the pathology report. Patients who had intussusceptions without surgical treatment that spontaneously subsided were included in the group of patients with benign lesions.

Results

In total, 49 patients with a diagnosis of adult intussusception were identified but three patients with intussusception caused by a gastroenterostomy were excluded. Therefore, 46 patients were enrolled in this study (Table 1). The patients ranged in age from 19 to 83 years, with a mean age of 58.2 years. Men predominated in a ratio of 1.5:1. There were 25 patients with an enteric intussusception and 21 patients with a colonic intussusception. Thirty-nine of 46 patients were found to have a pathologic lesion during the operation. Seven patients had idiopathic intussusception. Overall, 35 had benign and 11 had malignant intussusception.

The most common presenting complaint was abdominal pain, which was seen in all patients. Other symptoms and signs included nausea, vomiting, diarrhea, constipation, fresh bloody stool, coffee-ground vomitus, fever, and chills (Table 2).

Twenty-five patients presented with acute symptoms, which they experienced over a period of less than 3 days. The other 21
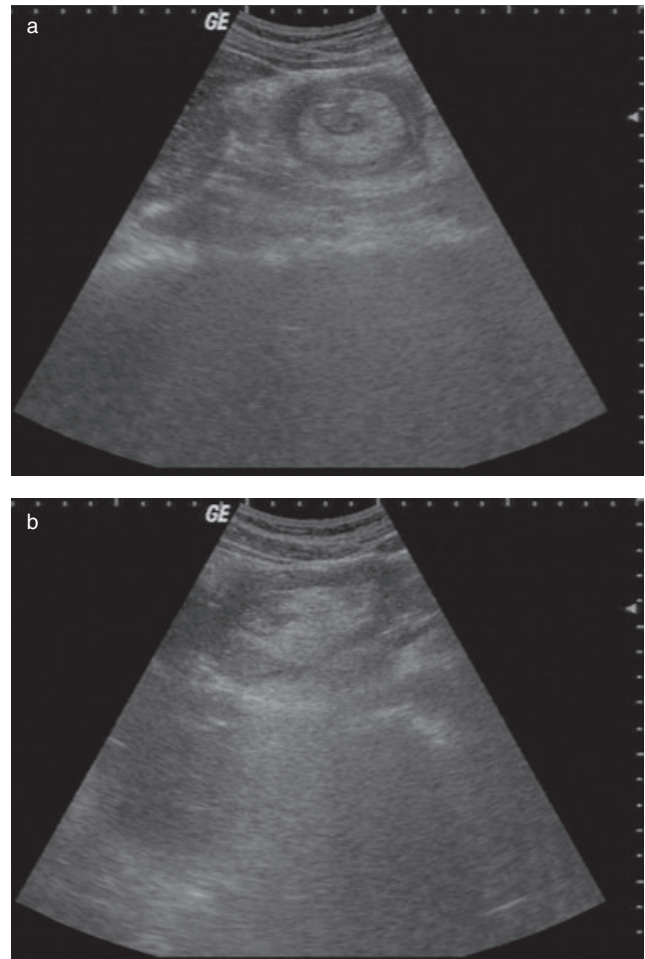

Figure 1 Abdominal sonography demonstrating (a) a target sign in transverse section or (b) pseudokidney sign in longitudinal section in an ileo-ileal intussusception caused by a lipoma.

patients had subacute to chronic symptoms lasting more than 7 days. The mean duration of symptoms was 13.5 days and ranged from 1 to 90 days. The mean durations of symptoms were 16.1 and 5.2 days for the benign and malignant intussusceptions, and 20.1 and 5.1 days for the enteric and colonic intussusceptions, respectively.

The diagnosis of gastrointestinal intussusception was made preoperatively in 89.1% of patients. Plain abdominal radiography was carried out in 37 patients, but gastrointestinal intussusception was not the impression in any of those. Abdominal sonography was performed in 28 patients, and 18 patients were diagnosed with intussusception by the image findings of a target sign or pseudokidney sign (Fig. 1). Abdominal computed tomography (CT) was performed in 35 patients, of whom 31 were diagnosed with an intussusception. The finding on CT is an inhomogeneous soft-tissue mass that is target or sausage shaped (Fig. 2). Colonoscopy was carried out in 11 patients, and five patients had findings suggestive of an intussusception due to narrowing of the obstructive colonic lumen with a smoothly edematous bulging mucosa

Figure 2 Abdominal computed tomography scan showing an inhomogeneous soft tissue mass that is target or sausage-shaped in an ileo-ileal intussusception caused by a lipoma (white arrow).
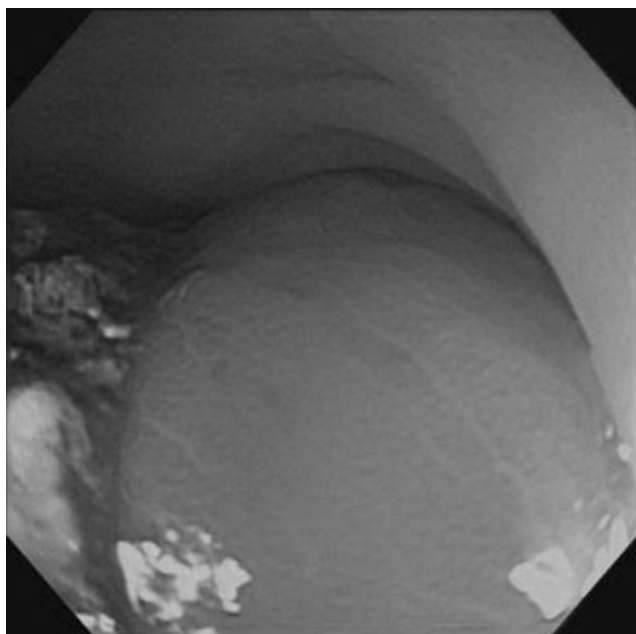
Figure 3 Colonoscopy demonstrating a narrowing of the obstructive colonic lumen with smoothly edematous bulging mucosa in an intussusception.

(Fig. 3). A small-bowel series was performed in five patients, and three patients had findings suspicious of an intussusception due to small-bowel obstruction with a tumor (Table 3).

Forty-four patients underwent an operation that proved a gastrointestinal intussusception in all except in two patients. One was a 33-year-old man who had experienced intermittent abdominal pain for 7 days, and abdominal CT showed a small-intestinal intussusception. However, spontaneous reduction of the small-intestinal intussusception occurred, and his symptoms were relieved about 4 days later. The other was an 82-year-old woman

with congestive heart failure and chronic renal insufficiency. A malignant colonic intussusception caused by an adenocarcinoma was diagnosed by colonoscopy and abdominal CT. The patient and her family declined surgery because of her age and poor general condition. Among the other 44 patients, an organic lesion was identified in 39 patients. The etiologies of these intussusceptions are summarized in Table 4.

Hydrostatic reduction before surgery was not carried out in our patients. An attempt to reduce the intussusception during the operation was carried out in 54.3% (25/46) of our patients. Among them, 76% (19/25) of patients with enteric intussusception and 28.6% (6/21) of patients with colonic intussusception underwent operative reduction; 57.1% (20/35) of patients with benign intussusception and 45.5% (5/11) of patients with malignant intussusception underwent operative reduction.

Five patients were lost to follow-up in our series. Almost 72% of patients were still alive at the time of writing. Among mortality cases, three patients died of a malignant lymphoma, two patients died of an adenocarcinoma, and one patient died of heart failure. Two patients (an 83-year-old man and a 74-year-old woman) died of postoperative complications including sepsis and pneumonia.

Discussion

Intussusception occurs when a segment of bowel and its mesentery (intussusceptum) invaginates the downstream lumen of the same loop of bowel (intussuscipiens). The sliding of bowel within the bowel is propelled by intestinal peristalsis and may lead to intestinal obstruction and ischemia. More than 90% of pediatric intussusceptions are idiopathic, and thought to be caused by enlarged nodes associated with an adenoviral infection.[9] Unlike the more-common idiopathic intussusception found in children, intussusception in adults remains a surgical disease. Based on a clinical or surgical diagnosis, a demonstrable etiology is found in 70–90% of cases of adult intussusceptions. A primary or secondary malignant neoplasm causes approximately 40% of them.[4–6] The causative lead point can be a benign polyp, a lipoma, the appendix, the Meckel's diverticulum, or a malignant tumor such as a lymphoma, gastrointestinal stromal tumor, or primary or metastatic adenocarcinoma.[1,7,10–11]

Clinical presentations of intussusception may vary dramatically, as one would expect, depending on the site of intussusception. Almost 46% of patients in our study had acute symptoms for less than 3 days, while the other patients presented with subacute to chronic symptoms with duration of 7–90 days. Erkan *et al.* reported that 61.5% of patients presented with acute symptoms and underwent an emergency laparotomy.[12] In comparison to that study, an acute presentation was relatively less common in our study. Abdominal pain was the most common symptom, while other symptoms were related to the location and extent of the intestinal obstruction. In our study, 60% of enteric intussusceptions were associated with nausea and vomiting in contrast to 42% of colonic intussusceptions including the ileocolic type, and 4% of enteric intussusceptions had bloody stool in contrast to 33% of colonic intussusceptions.

Our preoperative diagnosis rate was 89.1% in contrast to previous reports, such as 32% from Azar *et al.*[1] and 30.7% from Erkan *et al.*[12] We think one reason for this could be that most of our patients presented with subacute or chronic intermittent symp-

Table 3 Preoperative diagnostic studies

Investigation	No. performed	No. suggestive of intussusception	Accuracy (%)
Plain X-ray of the abdomen	37	0	0
Abdominal sonography	28	18	64.3
Abdominal computed tomography	35	31	88.6
Colonoscopy	11	6	54.6
Small-bowel series	5	3	60.0

Table 4 Etiology of intestinal intussusceptions

Etiology	Enteric ($n = 25$)	Colonic ($n = 21$)
Benign		
Idiopathic	5	2
Postoperative adhesion band	1	0
Diverticulum	1	0
Appendical inflammation	0	1
Inflammatory polyp	1	2
Hyperplastic polyp	0	1
Mesentery lymph node	1	0
Granuloma	1	0
Neurofibroma	1	0
Gastrointestinal stromal tumor	2	0
Hamartoma	3	1
Lipoma	6	6
Malignant		
Metastatic adenocarcinoma	1	4
Lymphoma	1	4
Leiomyosarcoma	1	0

toms, so physicians took more time to consider the possibility of gastrointestinal intussusception. Another reason is that we widely used abdominal CT for diagnosis in our study.

A number of different radiological and endoscopic methods have been described as useful in the diagnosis of intussusception: plain abdominal film, barium studies, abdominal sonography, abdominal CT scan, angiography, radionucleotide studies, and magnetic resonance imaging.[13–20] Most studies advise that abdominal CT provides the most accurate diagnostic rate for intestinal intussusception.[1,8,12] In our study, an 88.6% diagnostic rate of intestinal intussusception was achieved using abdominal CT scans. However, CT is not always reliable at directly distinguishing a neoplastic lead point from a thickened bowel wall.[14] The second most sensitive diagnostic tool in our study was abdominal sonography, with a 64.3% accuracy rate in the diagnosis of intestinal intussusception. The classic features of intussusception are the target and doughnut signs in transverse view and the pseudokidney sign in longitudinal view.[21,22] Limitations of abdominal sonography in the detection of intestinal intussusception include massive air in the obstructive and distended bowel loops and operator experience and technique. Colonoscopy may be useful in diagnosing colonic intussusception, but there are risks of perforation without utmost caution.

The optimal treatment for adult intussusception has not been established. Most surgeons consider that preoperative hydrostatic reduction is not mandatory. A laparotomy and resection of the

segment of bowel with the intussusception are recommended. In our study, hydrostatic reduction for adult intussusception was not advised as most cases were associated with a pathological lesion. In 84.8% of our patients, a lead point was found. None of our patients received hydrostatic reduction before surgery. Transient and nonobstructive intussusceptions are more likely to occur in the proximal small bowel and usually have an insignificant lead point. In our study, only one patient (2.2%) experienced spontaneous reduction of the intussusception, and this was suggestive of transient intussusception. Although 84.8% (39/46) of our patients had a lead point, operative reduction was used in only 54.3% (25/46) of patients because of the risk of tumor seeding. Operative reduction was cautiously performed in a nonischemic part of the involved bowel. During the operative reduction, we stopped this maneuver if the bowel showed severe ischemia or a risk of perforation. Operative reduction was not performed in most colonic intussusceptions because most of them were caused by a malignancy. The danger of reduction of the externally vital bowel with mucosal necrosis, intraluminal seeding, or venous embolization of malignant cells has been pointed out.[23,24] In addition, it is not advisable to attempt operative reduction but to proceed directly with resection if the bowel is severely inflamed, ischemic, or friable. In our series, 71.7% of patients were still alive at the time of this writing. Only two older patients died of postoperative complications.

In conclusion, most patients with adult intussusceptions in our series were men, and most intussusceptions were benign and of enteric origin. The most sensitive diagnosis modality for adult intussusception is an abdominal CT scan. Operative reduction is recommended for enteric intussusceptions but not for colonic intussusceptions. The prognosis of adult intussusception after surgery is good except in cases of malignancy. Wide use of abdominal CT can improve the diagnosis of adult intussusception before an operation.

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