Adult Intussusception: Clinical Experience from a Single Center

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Abstract Though frequently observed in children, intussusception is a rare state in adults. The treatment of intussusception in adults is different. In this trial, we have presented intussusception cases in adults that were treated and followed up in our department. The records of 31 adult intussusception cases surgically treated in our department between January 1993 and July 2012 were evaluated retrospectively. Among the 31 adult cases of intussusception that were treated during a period of 19 years, 10 were men, and 21 were women. The mean age was determined as 39.7 ± 5.3 . The presentation symptom was abdominal pain in all the patients. Failure to pass gas or feces was observed in 23 patients (74.2 %); nausea and vomiting, in 22 patients (70.9 %); hematochezia, in 16 patients (51.6 %); and weight loss, in 3 patients (9.6 %). The mean duration of symptoms was 4.8 days. Abdominal tenderness was found in all the patients. Muscular defense and rebound tenderness were determined in 13 patients (41.9 %). Findings of intussusception were found in 80.9 % of patients examined by abdominal ultrasonography and in 63.1 % of cases examined by computerized tomography. Resection of the intussuscepted bowel segment was performed in 87 % of the patients. In conclusion, intussusception in adults is a rare clinical entity. Intussusception should be considered in the differential diagnosis in patients presenting with spasmodic abdominal pain, especially in cases with intestinal

obstruction. The recommended surgical method is en bloc resection of the intussuscepted segment in cases suspected to carry a risk of malignancy.

Keywords Intussusception · Adult · Clinical experience

Introduction

Intussusception is defined as intussusception of the proximal segment of the intestine into the distal segment. This is a common clinical condition in childhood, but rarely seen in adults. The development, clinical presentation, and treatment are different among adults and children [1–3]. We presented our adult intussusception cases in this article.

Patients and Methods

The records of 31 adult intussusception cases operated at the Ataturk University Department of General Surgery between January 1993 and July 2012 were retrospectively evaluated. Recording of the age, gender, symptoms and physical examination, laboratory, and radiological and operation findings of the patients was made.

Results

Among a total of 692 intestinal obstruction cases operated in our department between January 1993 and July 2012, obstruction in 31 cases was determined to be due to intussusception. Ten were men, and 21 were women. Mean age of the patients was as 39.7 ± 5.3 (16–74). Twenty-eight cases

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presented with acute signs and symptoms. Abdominal pain was found in all the patients on presentation. Abdominal pain occurred as intermittent abdominal pain for varying durations in all the patients. Other complaints were obstipation in 23 patients (74.2 %); nausea and vomiting, in 22 patients (70.9 %); hematochezia, in 16 patients (51.6 %); and weight loss in 3 patients (9.6 %). In patients presenting with acute symptoms, the mean duration of symptoms was determined as 4.8 days (1–20 days) (duration of symptoms in this patient group was ≥ 10 days in two patients). In one of the three patients with a chronic prognosis, intussusception was observed during the surgical intervention performed for gastric lymphoma. The symptoms of intussusception in this patient were mixed up with symptoms of the underlying disease. The second patient in this group was a case of sigmoidorectal intussusception, who had previously undergone a gynecological operation, with symptoms persisting for around 3 months. The last patient had previously been diagnosed and treated for ulcerative colitis, with symptoms becoming more prominent in the last 6 months and then presenting with symptoms of acute abdominal pain.

Abdominal examination revealed various degrees of abdominal tenderness in the different quadrants of the abdomen. Muscular defense and rebound tenderness were found in 13 patients (41.9 %). Fever of ≥ 38 °C was found in four patients (12.9 %), while a palpable mass was detected on the abdominal examination of three patients (9.6 %).

The values of the white blood cell count of patients varied between 6,000 and 14,400/mm³ (mean value 10,400/mm³).

Diagnostic radiological evaluation was carried out by plain abdominal X-ray, abdominal ultrasonography (US) and computerized abdominal tomography (CT). Plain abdominal radiograms detected air fluid levels in 25 patients (80.6 %). Abdominal US was performed in 21, and abdominal CT, in 19 patients. Seventeen patients (80.9 %) who underwent US examination and 12 patients (63.1 %) who underwent abdominal CT had positive findings suggestive of intussusception. Lower gastrointestinal system endoscopy was performed in five patients prior to surgery (findings suggestive of obstruction in the large intestine were found in all of these cases). While one patient could not be evaluated due to insufficient colon cleansing, an intussuscepted polyp and an accompanying intestinal segment were observed in the remaining four patients Table 1.

Table 1 Diagnostic radiological evaluation

	<i>n</i> =31 (%)	Diagnosis (%)
Abdominal radiograms	31 (100)	25 (80.6)
Abdominal US	21 (67.7)	17 (80.9)
Abdominal CT	19 (61.2)	12 (63.1)
Endoscopy	5 (16.1)	4 (80)

Based on the clinical findings and auxiliary radiological examinations, 23 patients (74.2 %) were pre-diagnosed with intussusception prior to surgery.

Apart from two patients, emergency surgical intervention was carried out in all patients. Intussusception was detected in one segment in 29 cases, while intussusception was present in two separate segments in two patients. In three patients, another intra-abdominal pathology accompanied intussusception (gastric lymphoma, ulcerative colitis, and postoperative generalized adhesions). Ischemia was found in the intussuscepted intestinal segment in three patients. No cause was determined for intussusception in seven patients Table 2.

In cases with no specific cause of intussusception, the intussuscepted segment was reduced without interfering with the intestinal continuity. The intussuscepted segment was resected in other intussusception cases, except for two cases. Enterotomy and polypectomy were performed in two patients.

Various complications were observed following surgery in ten patients. These complications have been presented in Table 3.

Discussion

In contrast to the common occurrence in childhood, invagination is rather rare in adults [3, 6, 8]. In our series, the prevalence of disease was calculated as 4 % among all cases with etiologies causing intestinal obstruction during a period of approximately 19 years. Invaginations in adults have been reported to cause 1–5 % of intestinal obstructions [1].

Intussusceptions in adults are reported to comprise 5 % of all intussusception cases [1]. Although the exact mechanism of intussusception of the proximal segment to the distal is not fully understood, it is known that in adult cases, there is often (90 %) a lesion called “lead point” which is mostly arising from the intestinal wall and rarely extraluminal [2–5]. This lead point is commonly a tumor, and tumors of the small intestine have been reported to constitute 14–47 % of intussusceptions [2, 3, 6, 7]. In general, small bowel masses causing intussusception are benign, and malignancy is reported in only 5–30 % of the patients [1, 3, 5, 8]. The condition is the opposite in colonic intussusceptions; the majority of colonic intussusceptions have been reported to be due to a cancerous mass [1, 3, 4, 8]. As a matter of fact, Goh et al. [1] indicated colonic intussusception as a predictor for malignant tumors [1]. No specific cause could be found in 8–20 % of the cases. Once more, this condition was indicated to be more common in the small intestine [3]. In five of our patients (16 %), no specific luminal cause was found for the intussusception. All of these cases were small

Table 2 Invaginations and the causes in all the patients

<i>n</i>	Age	Gender	Main symptom	Intussusception	Causes	Treatment	Complication
1	25	Male	Abdominal pain	Jejunioileal	Idiopathic	Resection	No
2	62	Female	Abdominal pain	Jejunojejunal	Adenomatous polyp	Desinvagination	No
3	16	Female	Abdominal pain	Jejunojejunal	Adenomatous polyp	Resection	Yes
4	12	Male	Abdominal pain	Ileoileal	Lymphoma	Resection	Yes
5	25	Female	Abdominal pain	Ileocolic	Adenomatous polyp	Resection	Yes
6	25	Female	Obstipation	Ileoileal	Adenomatous polyp	Desinvagination	Yes
7	21	Female	Nausea and vomiting	Ileoileal	Lymphoma	Resection	Yes
8	51	Male	Nausea and vomiting	Ileoileal	Idiopathic	Resection	No
9	35	Female	Abdominal pain	Ileoileal	Idiopathic	Resection	Yes
10	37	Female	Abdominal pain	Ileoileal	Idiopathic	Polypectomy	No
11	38	Female	Obstipation	Jejunioileal 1	Idiopathic	Desinvagination	Yes
12	39	Female	Abdominal pain	Colocolic	Lipoma	Desinvagination	Yes
13	45	Male	Nausea and vomiting	Ileoileal	Adenomatous polyp	Polypectomy	No
14	41	Female	Obstipation	Colocolic	Lipoma	Resection	No
15	38	Female	Obstipation	Ileoileal	Adenomatous polyp	Resection	No
16	37	Female	Abdominal pain	Ileoileal	Idiopathic	Resection	No
17	23	Male	Nausea and vomiting	Sigmoidorectal	Idiopathic	Desinvagination	No
18	25	Male	Obstipation	Jejunojejunal	Adenomatous polyp	Resection	No
19	38	Female	Obstipation	Ileoileal	Adenomatous polyps	Resection	No
20	27	Female	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
21	65	Male	Abdominal pain	Sigmoidorectal	Adenomatous polyp	Resection	Yes
22	26	Male	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	Yes
23	70	Female	Nausea and vomiting	Ileoileal	Adenomatous polyp	Resection	No
24	69	Female	Abdominal pain	Ileocolic	Adenomatous polyp	Resection	No
25	67	Male	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
26	74	Female	Obstipation	Ileoileal	Adenomatous polyp	Resection	No
27	18	Female	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
28	29	Female	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
29	53	Female	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
30	60	Male	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No
31	34	Female	Abdominal pain	Ileoileal	Adenomatous polyp	Resection	No

bowel intussusception, and in colonic cases, there was always a mass responsible.

While the disease develops with acute symptoms in children, it has been stated that the disease exhibits a subacute or chronic and even intermittent abdominal pain in adults [2, 5, 6, 9]. However, the disease exhibited an acute onset (less than 10 days) in 28 of our cases. The mean duration of symptoms

in these patients was 4.8 days. Tan et al. [6] reported subacute and chronic prognosis in one third of the cases in their series [6]. The corresponding rate was reported as 57 % in the trials of Goh et al. [1]. In this respect, our patients exhibited an onset similar to pediatric cases and differed from adult intussusceptions reported in the literature [1].

The clinical findings of intussusception in childhood have been stated as a classical triad of abdominal pain and abdominal mass on the physical examination of the abdomen and hematochezia, while it is almost impossible to see this triad in adult patients [4, 5]. Tan et al. [6] reported a wide range of nonspecific symptoms and signs in adults. This condition further complicates the diagnosis of the disease [6]. Takeuchi et al. [4] reported that they did not encounter this triad among their series [4]. The patients in the current trial also differed in terms of this parameter.

Table 3 Postoperative complication

	<i>n</i>	%
Surgical site infection	7	22.5
Pulmonary atelectasis	4	12.9
Pulmonary thromboembolism	2	6.5
Wound dehiscence	1	3.2

Abdominal pain was found in all of our cases. An intermittent pain of colic type was observed more commonly. Intermittent abdominal pain was reported to be a characteristic for intussusception [6]. Although the findings of intussusception are expected to develop as signs of intestinal obstruction in general, Goh et al. [1] observed signs of intestinal obstruction in only 36.7 % of the cases [1]. However, findings of obstruction were present in 74.2 % of our cases. On the other hand, hematochezia was observed in 51.6 % of the cases in our series. Findings of peritoneal irritation (rebound tenderness and muscular defense) were found in 41.9 % of our cases.

In contrast to pediatric cases, the rate of detection of a palpable mass is not so high in adults, and the rate of presence of a mass has been reported as 7–42 % [1, 6]. A palpable mass was detected in 9.6 % of our cases during the physical examination.

Diagnostic procedures for invagination are plain abdominal radiograms, abdominal USG, radiographic examinations with contrast, abdominal tomography, and endoscopic procedures [6]. Plain abdominal radiograms do not provide specific findings in intussusception; however, findings of intestinal obstruction in 50 % of the cases were reported [1]. Plain films revealed positive findings suggestive of intestinal obstruction in 80.6 % of our patients. However, these findings were nonspecific in terms of intussusception. Abdominal CT and US are required to reveal specific findings. In previous trials, abdominal US was determined as the most appropriate diagnostic procedure in both children and adults. On the other hand, US has limited action in obesity and in abdominal distention due to gas formation which is frequently seen in these cases [2, 5, 10]. The diagnostic value of abdominal US in our patients was considerably high (80.9 %). Findings of CT have been reported to vary as per severity of intussusception. Various CT findings have been reported, ranging from a target lesion surrounded by fatty density to sausage-shaped masses [2, 10]. However, CT failed to provide the expected findings in our series. Significant relevant findings of intussusception were found in only 12 of those undergoing tomography (63.1 %). Tan et al. [6] evaluated the diagnostic value of tomography as considerably high, and similar results were reported by Sandrasegaran et al. [2] and Takeuchi et al. [4]. Efficient use of CT may prove to be beneficial in the diagnosis in such patients. In our series, abdominal US was employed more efficiently. In a number of series, the rate of pre-operational accurate diagnosis has been given as 40–80 % [3]. On the other hand, Takeuchi et al. stated that the diagnosis generally becomes more prominent during the operation [4]. Among our cases, the diagnosis was confirmed during the operation in only eight cases (25.8 %).

Surgical operations implemented in adult intussusception are controversial. The recommended primary procedure is laparotomy [4]. However, in the trial conducted by Rea et al.

[11], the authors suggested that an urgent decision of laparotomy should not be adopted and that the decision should be based on the diameter and length of the intussusception and the presence of a lead point and findings of intestinal obstruction on abdominal tomography [11]. This is not true according to our findings since there is mostly a leading point in adult intussusceptions, and spontaneous reduction of the intussusception is not the case for adults. Therefore, in our opinion, intussusception in adult patients has to be treated surgically. However, the selection between resection and desinvagination of the affected intestinal segment is debated [1]. Reduction has been criticized as to be the cause of spread of tumor cells from the tumoral mass, leading to invagination of the infective material into the peritoneum or dissemination via the venous route. Essentially, reduction is not recommended in cases where the intussuscepted segment is due to a tumorous lesion [1, 12]. Since colonic intussusceptions are mostly related to malignant tumorous lesions, reduction is not recommended in such cases. The recommended method is en bloc resection of the mass lesion as per oncological principles [3, 5, 13–18]. This is also our approach, and we recommend surgical excision of the intussusception in adult. In lesions of the small intestine, reduction is recommended in cases where ischemia, gangrene, and malignancy have been excluded [4, 5, 15]. In non-gangrenous cases, surgical resection of the polyp through enterectomy may be another alternative [3].

In conclusion, adult intussusception is a rare clinical entity. In general, a specific cause is present in the intestinal wall or the lumen. Although the clinical findings have been stated to be nonspecific in the literature, the findings in our series partially exhibited specific characteristics. Similarly, the diagnosis of intussusception has been reported as problematic in the literature, while the success rate in our series was determined as 74.2 %. We recommend surgical treatment that consists of en bloc resection of the intussusceptions segment. Reduction should be spared for selected cases.

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