Case Report

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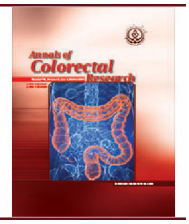

Colonoscopy-Assisted Intussusception Reduction in Children: A Case Series of 15 Patients

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Abstract

There are few reports on the therapeutic role of colonoscopy in correcting intussusception of childhood. In this report, we describe a case series of 15 children (14 boys and 1 girl) who presented with acute intussusception and were successfully treated by colonoscopy. The patients were referred to the gastroenterology clinic of Amir-Al-Momenin Hospital, Zabol, Iran from 2015 to 2018. The mean age of the patients was 36.6±28.7 months. After establishing the diagnosis, the patients underwent colonoscopic reduction of intussusception by an experienced gastroenterologist. Follow-up sonography was performed 24 hours following the procedure. A total of 6 recurrences were identified in 4 (26.7%) patients; the first recurrence was managed with a second colonoscopy, while the second recurrence (2 patients) was managed with surgical reduction. Accordingly, colonoscopic reduction yielded an overall success rate of 86.6%. Given that colonoscopy provides visual access in a real-time setting, it can be used as either a primary option or an alternative to radiologic and surgical procedures for intussusception reduction in children.

Keywords: Intussusception, Endoscopy, Enema, Children

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Introduction

Intussusception is an emergency condition that should be considered in young children with symptoms of intestinal obstruction. The condition is most commonly seen in children younger than two years of age. Although acute abdominal pain is highly expected, the classic presentation is routinely absent, delivering a diagnostic dilemma for pediatricians and gastroenterologists (1). From a pathological point of view, intussusception is diagnosed when one intestinal segment (i.e., the intussusceptum) penetrates into distal parts of the bowel (i.e., the intussuscipiens). If the intussusception is left undiagnosed, diagnosed with delay, or manhandled, the intestinal blood flow is interrupted, culminating in tissue necrosis and finally perforation (2). There are no definite identifiable triggers for intussusception in most patients. However, some risk factors have been defined including intestinal polyps, Meckel diverticulum, precedent viral infections, cystic fibrosis, and abdominal cancers (3).

Intussusception can be managed with either surgical or non-surgical approaches. The non-surgical methods (i.e., contrast enema) encompass elevation of intraluminal pressure by introducing air, saline, or barium into the rectum. The process can be monitored either by fluoroscopy or ultrasonography. Furthermore, patients may be administered with various adjuvants (e.g., glucagon; antibiotics; dexamethasone) to facilitate the process and avoid recurrence (4). Laparotomy is the main surgical procedure to resolve intussusception. However, due to its invasive nature and possible post-operative complications, surgery remains limited to cases where contrast enema fails (5). The current intussusception reductive strategies including barium, liquid, and air enemas deliver success rates ranging from 60% to 90% (6). The therapeutic role of ultrasonography has been under investigation in recent years, though no conclusive reports are available (7).

Objective

Although colonoscopy has been suggested as an appropriate diagnostic tool, its therapeutic value remains uncertain, and few case reports of colonoscopic reduction of intussusception are available in adults. Here, we present the first report of successful colonoscopic reduction of intussusception in children.

Case Series

This is a report of 15 patients with intussusception who referred to the gastroenterology clinic of Amir-Al-Momenin Hospital (Zabol, Sistan and Baluchestan, south-east of Iran) from 2015 until 2018. The patients were diagnosed with ultrasonography. The youngest and oldest children had 6 and 108 months of age, respectively (mean: 36.6±28.7 months). From the 15 patients, 14 (93.3%) were males. The time-lapse from presentation to admission was <24 hours in 9 (60%) of the patients. All the patients were conscious at the time of admission and 10 (66.7) had nausea. Anorexia (100%) and abdominal pain (80%) were the most common presenting symptoms.

After establishing the diagnosis, the patients underwent colonoscopic reduction of intussusception by an experienced gastroenterologist. Most of the cases (86.7%) had ileocolic evagination. The mean length of evagination was 25.66±8.8 (Table 1). After 24 hours of the procedure, follow-up sonography was performed. Overall, 6 recurrences were identified in 4 (26.7%) patients. The first recurrence was managed by a second colonoscopy. A second recurrence was detected in two patients, who finally underwent surgical reduction. In one patient who had been diagnosed with ileocolic evagination, the second recurrence was of jejunal type. All the patients without recurrence were discharged with good clinical condition 24 hours after the procedure. The patients with two recurrences were also discharged once stable after surgery.

Discussion

Intussusception is one of the most serious diseases associated with intestinal obstruction. In the present case series, 6 children (40%) were older than 3 years while none were younger than 6 months of age, highlighting the rare nature of occurrence of this

Table 1: Demographic and clinical characteristics of 15 children diagnosed with intussusception and managed by colonoscopy

Par.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age (months)	48	30	10	6	18	24	12	6	60	36	36	24	30	108	18
Sex	m	m	m	m	m	m	m	m	m	m	m	m	f	m	m
D.S (hours)	72	24	6	24	8	24	72	72	48	8	24	48	24	24	48
Con.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Nau.	-	-	+	+	+	-	+	+	+	+	+	+	+	+	-
Vom.	-	-	+	+	-	-	+	+	+	+	+	+	-	-	-
Dia.	+	-	-	+	-	+	+	+	+	-	-	+	-	-	+
Hem.	+	-	-	+	-	+	-	-	-	-	-	+	-	-	-
Gel.F	+	-	+	+	-	+	+	+	-	-	-	+	-	-	-
Abd.D	+	+	+	+	+	+	+	+	-	-	-	+	-	-	+
Abd.M	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
Ano.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fev.	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
Abd.CrP	+	+	+	+	+	+	+	+	+	-	-	+	+	+	-
Per.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Invag.T	A	A	A	A	A	A	A	A	B	A	A	C	A	A	A
Invag.L	26	22	30	37	16	35	28	18	17	44	30	15	22	30	15
Recurr.	-	+	-	-	-	+	-	+	-	-	-	-	-	+	-
Recurr.N	-	1	-	-	-	1	-	2	-	-	-	-	-	2	-

Par: parameters, D.S: duration of symptoms, Con: consciousness, Nau: Nausea, Vom: vomiting, Dia: diarrhea, Hem: hematochezia, Gel.F: gel-like feces, Abd.D: abdominal distension, Abd.M: abdominal mass, Ano: anorexia, Fev: fever, Abd.CrP: cramp abdominal pain, Per: peritonitis, Invag.T: Invagination type, Invag.L: Invagination length, Recurr: recurrence, Recurr.N: number of recurrence, A: ileocolic, B: jejunal, C: Ileoileal

condition in children younger than 2 months of age (8). Ileocolic intussusceptions are the most common forms of this condition; we also found that 86.7% of our patients showed this type of abnormality.

The diagnosis of intussusception based on clinical presentation is uncertain because of its unspecific symptoms. The most typical picture may be seen as vomiting and abdominal pain in a child. The most common presentations in our patients included anorexia (100%), abdominal pain (80%), nausea (66.7%), abdominal distention (66.7%), vomiting (53.3%), diarrhea (53.3%), jelly feces (46.7%), hematochezia (26.7%), fever (20%), and abdominal mass (13.3%). The typical presentation of childhood intussusception (i.e., abdominal pain, jelly feces, and bowel mass) has been reported in 7.5 to 40% of affected children (6, 9, 10). Here, 2 out of 15 cases showed this triad. The most consistent clinical sign is an abdominal mass (6), which was observed in 2 (13.3%) of our cases. The presence of palpable abdominal mass can augment the diagnostic sensitivity of ultrasonography to 91.7% (11). In a report on 41 adults with intussusception, the frequencies of acute, subacute, and chronic clinical presentations reached 24.4%, 24.4%, and 51.2% respectively (11). In one report on 12 children >5 years old with intussusception, chronic presentation lasting more than one week was noted in 33.3%, and the most common presentations were abdominal pain (100%) and nausea and vomiting (75%) (12). Nevertheless, the diagnosis of intussusception based on clinical features is challenging and the condition requires highly specific imaging procedures for diagnosis.

This research and previous reports highlight the potential role of colonoscopy in the diagnosis and treatment of intussusception (13) In the present case series, after successful colonoscopic reduction of intussusception, 6 recurrences were identified in 4 (26.7%) out of 15 patients. The first recurrence was managed by a secondary colonoscopy, while the second recurrence was (in two patients) was managed by surgical reduction. According to this, colonoscopy delivered a success rate of 86.6%. In only one recent report on colonoscopic management in 30 children with intussusception, Tafner *et al*. reported a 66.7% success rate, while 33.3% of their patients required surgery (14). Currently, treatment and management of intussusception mainly relies on either air or liquid (saline) enema (15). The role of surgical intervention is highlighted in cases in whom enema fails to correct the defect. The first therapeutic attempts were reported in the 18th and 19th centuries (16, 17). In the late of 19th century, ultrasound was used for the first time to diagnose and manage intussusception (5, 7). Previous reports on therapeutic applications of colonoscopy in patients with intussusception limit are limited to adults diagnosed with intussusception in the context of Henoch-Schönlein purpura syndrome (18), Cronkhite-Canada syndrome (13) and colon cancer (19). Our report in particular highlights the great potential of colonoscopy as a surrogate to other therapeutic modalities in children with intussusception. To date, colonoscopy mostly has been used for diagnostic purposes in patients with subacute non-enteric intussusceptions (11, 20). Based on our experience, however, colonoscopy can be used as an excellent therapeutic approach even in cases with acute presentations.

The diagnosis and treatment of childhood intussusception have always concerned pediatricians and gastroenterologists. The therapeutic approaches in this condition are yet to become more efficient and reliable. In this report, we described successful colonoscopic reduction of intussusception in children. This method can be used as a surrogate to surgery in patients in whom enema and other therapies fail to correct the defect.

Ethical consideration: All parents were utterly informed of the procedure and its potential risks and gave their verbal and written consents. No information regarding the identity of patients was disclosed.

Conflict of Interests: None declared.

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