Pediatric Colocolic Intussusception With Pathologic Lead Point: A Case Report

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Abstract

Intussusception is one of the most common causes of acute abdominal pain in the pediatric population. The majority of cases are idiopathic and ileocolic in location. Colocolic intussusception is an uncommon type of intussusception in children that is usually associated with a pathologic lead point. In this article, a case of colocolic intussusception in a four-year-old male secondary to juvenile polyps is presented followed by a discussion of intussusception and the available imaging modalities used in diagnosis and treatment.

Keywords: Intussusception; Colocolic; Polyp; Juvenile

Introduction

Colocolic intussusception is an uncommon type of intussusception in children that is usually associated with a pathologic lead point. We present a case of recurrent colocolic intussusceptions in a four-year-old male, erroneously thought to be the most common ileocolic type. Following surgery, a lead point was found, juvenile polyps in the transverse colon.

Case Report

A four year-old male was brought to the clinic by his parents with worsening vomiting and diarrhea for three days. His parents have observed him curling up and arching his back intermittently and recently had one episode of bloody stools. His past medical history was unremarkable with the exception of uncomplicated surgical excision of penile skin bridges at two years of age. The patient was referred to our institution for an abdominal ultrasound to evaluate for intussusception. The ultrasound showed a 7.3 × 2.7 ×3.7 cm mass in the left lower quadrant with a target-like appearance consistent with intussusception (Fig. 1). The diagnosis was confirmed with air enema and the intussusception was successfully reduced (Fig. 2). The patient was admitted for observation and discharged the following morning in good condition. Five days later, the patient's parents found him curled up and brought him back to the hospital. The patient was admitted and ultrasound was performed which again demonstrated an abdominal mass with a target sign. The intussusception was successfully reduced with air contrast enema (Fig. 3) and exploratory laparoscopy was performed to search for a meckel's diverticulum or mass lesion. At surgery, there was no evidence of meckel's diverticulum
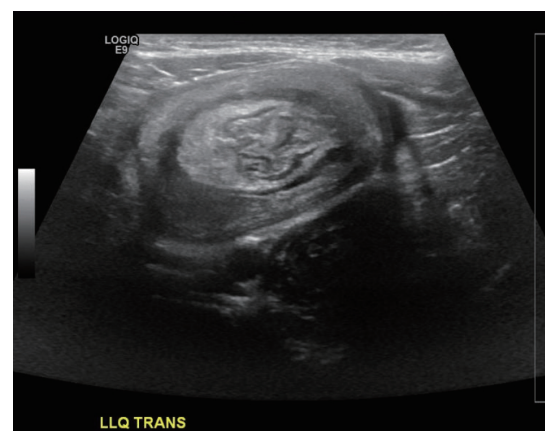
Figure 1. Transverse ultrasound image of the left lower quadrant demonstrates a mass with a "target" sign.
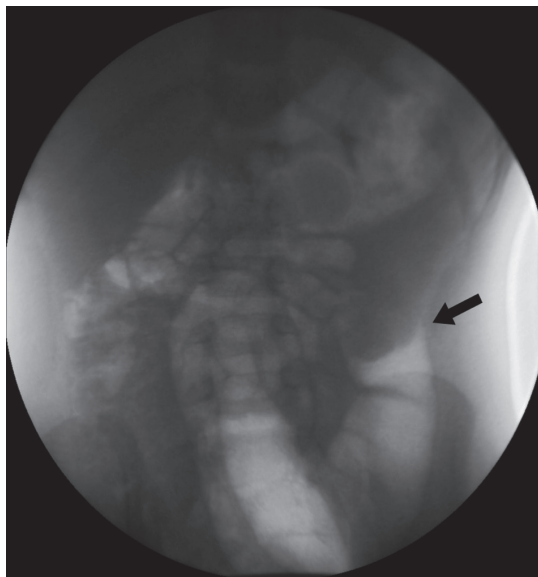
Figure 2. Air enema demonstrates a filling defect in the descending colon surrounded by a crescent of air representing the intussusceptum. Real time images demonstrated retrograde movement of the filling defect as the intussusception was reduced.

or other lead point at the serosal surface of the small bowel or colon. The patient was discharged in good condition. Before his followup appointment, he had three more days of abdominal pain and bloody stools. He was admitted with ultrasound and air contrast enema again demonstrating a left
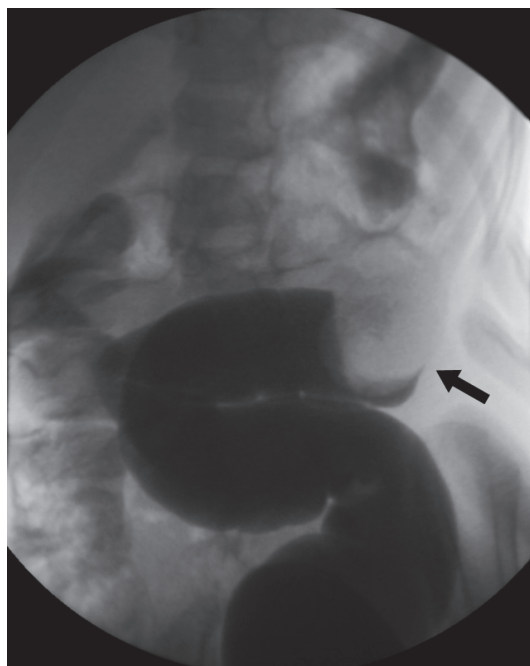

Figure 4. Pedunculated juvenile polyp is isolated from the mesenteric side of the transverse colon mucosa for surgical excision.

lower quadrant intussusception with questionable colonic filling defect. The intussusception was again reduced and the patient was taken to the operating room for open diagnostic laparotomy. A mass was palpated in the transverse colon and segmental colectomy was performed. Two large intraluminal pedunculated polyps (measuring $3.3 \times 2.5 \times 2.0$ cm and $2.2 \times 2.0 \times 1.0$ cm) and one small polyp were identified on the mesenteric side of the bowel (Fig 4). Pathologic examination revealed these to be juvenile polyps without atypia. The patient recovered well from surgery and has had no further

Figure 3. Single contract enema again shows a filling defect in the colon, representing the intussusceptum.
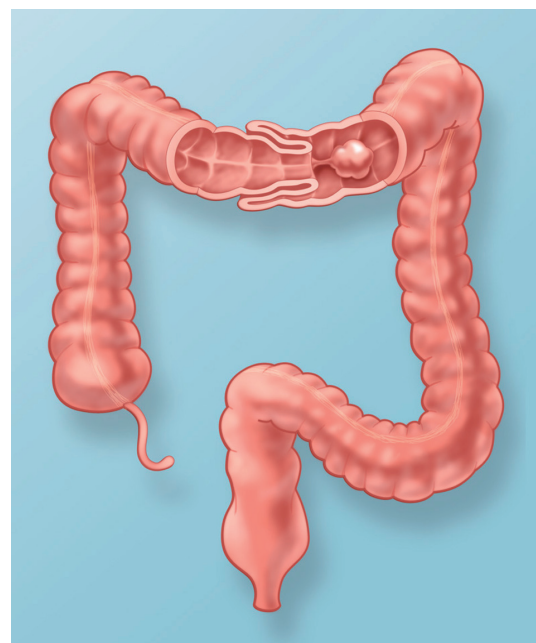

Figure 5. Artist's rendering of the colon with coronal window through the transverse colon demonstrates intussusception secondary to a pedunculated polyp. Peristalsis pulls the large polyp distally, dragging the attached bowel wall into the intussuscipient.
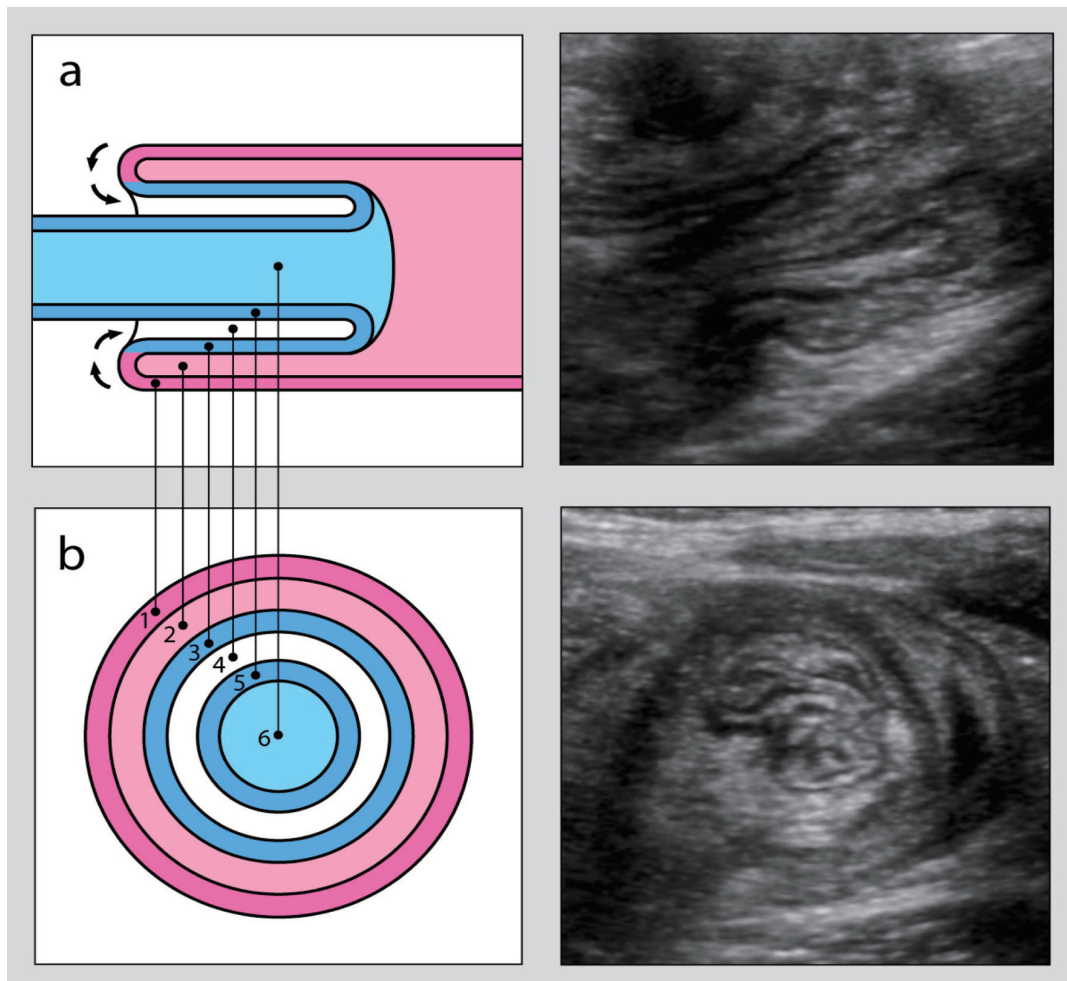
Figure 6. Longitudinal (a) and transverse (b) cross-sectional views of an intussusception. Images on the left graphically represent the intussusception complex while corresponding ultrasound images are depicted on the right. The outer layers represent the intussuscepient while the inner layers represent the intussusceptum. The bowel wall (1) and lumen (2) of the intussuscepient make up the outer rings. The inner rings are comprised of the bowel wall (3 and 5) and lumen (6) of the intussusceptum surrounded by mesenteric fat (4). In vivo, the lumen is collapsed and the echogenic rings on ultrasound represent interfaces between the mucosa, submucosa, muscularis, and serosa.

episodes of intussusception. Colonoscopy was scheduled to evaluate for other polypoid lesions.

Discussion

Intussusception is one of the most common causes of acute abdominal pain in infancy [1-3]. Intussusception results from invagination of a segment of bowel wall that is pulled into its lumen and becomes telescoped into adjacent bowel segment at times far from the starting point (Fig. 5). The condition usually occurs between the age of 6 months and 2 years [1]. The vast majority of intussusceptions in children are ileocolic, meaning the ileum becomes telescoped into the colon. If correctly diagnosed and treated, the majority of patients have a very good prognosis.

The classic clinical triad of acute abdominal pain (col-

ic), currant-jelly stools or hematochezia, and a palpable abdominal mass is present in less than 50% of children with intussusception [4]. The onset of nonspecific abdominal symptoms in which vomiting predominates, the absence of passage of blood via the rectum (usually in cases of less than 48 hours duration), and the inability to obtain a reliable history from these nonverbal children lead to dismissal of the diagnosis of intussusception in almost 50% of cases [5]. In some cases lethargy and convulsions predominate [6].

The majority of pediatric intussusceptions are idiopathic without pathologic lead point [1, 7]. Intussusception lead points such as a Meckel diverticulum, duplication cyst, polyp, or tumor (eg, lymphoma) are uncommon in infants. Intussusception lead points are more common in neonates (< 30 days old), older children (> 5 years old), and cases restricted to the small intestine. Colocolic intussusception in the adults is almost always a complication of pre-existing

colonic disease, usually carcinoma or polypoid tumor [8]. Pediatric patients presenting with documented colocolic intussusception should suggest the possibility of a colonic polyp or other mass lesion [9]. RotaShield, the first generation rotavirus vaccine, was shown to cause a transient risk of intussusception and was therefore withdrawn from the market [10]. The possible risk of intussusception in second generation vaccines is under debate.

Studies on the absolute prevalence of intussusception in the United States are not available [11]. Its estimated incidence is approximately 1 case per 2000 live births. In Great Britain, incidence varies from 1.6 - 4 cases per 1000 live births. Overall, the male-to-female ratio is approximately 3:1. With advancing age, gender differences become marked; in patients older than 4 years, the male-to-female ratio is 8:1. The studies of prevalence of the disease refer to ileocecal intussusception, which is the most common type. Colocolic intussusception is very rare in the pediatric population and there are no studies to document the exact prevalence of the disease. A rare occurrence of colocolic intussusception in a neonate with malrotated intestine was reported, that was believed to the first reported case in the neonatal period where the pathogenic lead point was an intestinal lymphangioma [12]. Juvenile colonic polyps have been reported to cause colocolic intussusception [13]. Colocolic intussusception has also been reported without anatomic lead point [9, 14]. In a study performed to compare ileocolic to colocolic intussusception it was found that in the colocolic group, there were fewer shocked and pyrexial patients, and the rate of successful nonoperative reduction was higher [15]. The groups had a similar incidence of surgical intervention. In the ileocolic group, there was a higher mortality rate and more complications, but only the higher resection rate was statistically significant.

Abdominal radiography is the most common initial study used in the workup of adbominal pain and suspected intussusception. Abdominal radiographs have low sensitivity and specificity for the diagnosis of intussusception, although they are useful in demonstrating other causes of abdominal pain and excluding free intraperitoneal air when enema is planned [16]. The addition of decubitus view increases the ability to diagnose or exclude intussusception and free air [17]. However, a quarter of intussusception cases will have a normal abdominal radiograph [18]. The meniscus sign is specific in plain abdominal radiographs for the diagnosis of intussusception. The meniscus sign is formed by the interface of the soft tissue density intussusceptum with air adjacent to its convexity in the intussuscepient. Although this sign is very specific it is not always seen. When the meniscus sign is seen the patient can go directly for fluoroscopic enema either with air or water-soluble contrast for confirmation of the diagnosis and reduction. At times opacity in the right lower quadrant of the abdomen without presence of bowel gas in frontal and left lateral views radiographs increases the

suspicion for the diagnosis. In all other cases the abdominal radiograph is nonspecific. If free air is identified on the initial radiograph, the next step is surgical management and enema is contraindicated.

Ultrasonography is a well established imaging modality for the diagnosis of intussusception [19]. Not only is ultrasound sensitive and specific in the diagnosis of intussusception, it also does not expose the patient to ionizing radiation. Pathologic lead points can also be identified [20]. Sonographically a bull's eye or target-like lesion on transverse views is the most frequently described appearances of intussusception (Fig. 6). This appearance is formed by a loop of bowel (intissusceptum) within another loop of bowel (intussuscepient). The target sign is also seen on radiographs when the involved bowel is viewed en face [21]. On ultrasound, the wall of the intussusceptum and the intussuscpient has the sonographic characteristics of bowl wall with multiple interfaces of mucosal and serosal layers. Echogenic layer surrounds the intussusceptum that corresponds to mesenteric fat. Longitudinal view of the affected bowel segment resembles the appearance of a kidney called pseudo-kidney. Ultrasound has a high sensitivity and specificity for intussusception and has been shown to be a reliable and inexpensive imaging modality in developing countries [22].

The first step in management of intussusception is air or contrast enema guided with either fluoroscopy or ultrasound. Ultrasound guided reduction is typically performed with saline, although air has also been used. The reducibility, recurrence rate, recurrence pattern, and long term outcomes of intussusception has been shown to be similar between air and contrast enemas [23]. There is conflicting evidence regarding the complication rate between air and contrast enemas with the risk of perforation more closely related to the applied pressure and degree of pressure fluctuation [1, 24]. If fluoroscopic contrast enema is performed, water soluble contrast is preferred over barium due to the risk of barium peritonitis [1].

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