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Case Report

# Appendiceal Intussusceptions in a 5-Year-Old Boy

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## Abstract

Appendiceal intussusception (AI) is a rare condition with an incidence of approximately 0.01%. It is usually intraoperatively diagnosed in patients with suspected acute appendicitis and characterized by an invagination of the appendix into the cecum to various degrees. The treatment is surgical reduction of the appendix and appendectomy; however since symptoms are not specific, clinical diagnosis is challenging and frequently only made during surgery. We present the case of a 5-year-old boy who presented with a three day history of right lower quadrant pain. Abdominal ultrasound of this region showed a tubular structure of an 8mm in diameter. During laparotomy, an intussuscepted appendix with 1/3 of its base invaginated into the cecum was confirmed.

**Keywords:** Appendix; Laparatomy; Surgery; Appendectomy

## 1. Introduction

Appendiceal intussusception is a rare condition with an incidence of approximately 0.01% of patients who underwent appendectomy [1]. This condition can mimic various chronic and acute abdominal conditions. It is an important entity to recognize since it could be mistaken for a cecal mass [2]. The pediatric age group is most often affected. Appendiceal intussusception can occur without any underlying abnormality [3]. Anatomical variations of the appendix and pathological conditions such as tumors or polyps, endometriosis, parasitism, cystic fibrosis, fecaliths and foreign bodies, lymphoid follicles have all been described as possible causes. Symptoms of appendiceal intussusception have been divided into four groups: asymptomatic patients, symptoms similar to acute appendicitis, symptoms consistent with intestinal intussusceptions, and a lower quadrant abdominal pain [4]. Vomiting and melena may be present. The diagnosis is rarely made preoperatively because of its variable presentation and nonspecific symptoms. We report on a 5-year-old boy with this condition and discuss features that may direct the pediatric surgeon to achieve early recognition and provide optimal treatment.

## 2. Case Representation

A 5-year-old boy presented with a 3-day history of right lower quadrant pain, no vomiting, and high body temperature. The labs were remarkable for a WBC of 8.9 with 46% lymphocytes and 36% granulocytes. Ultrasound of the abdomen showed enlarged lymph nodes in the right lower quadrant with a diameter up to 14mm.

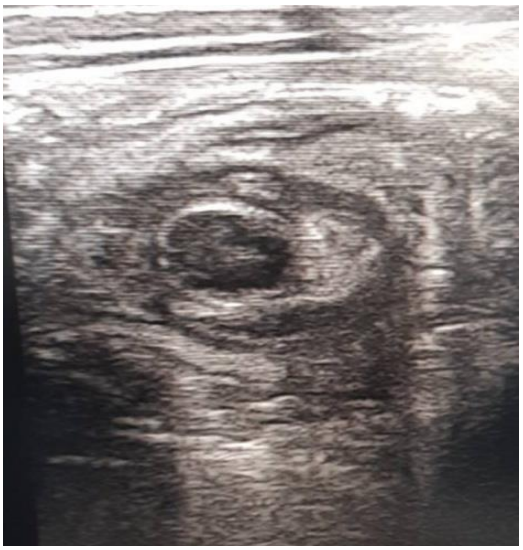

**Figure 1:** Ultrasound of the abdomen.

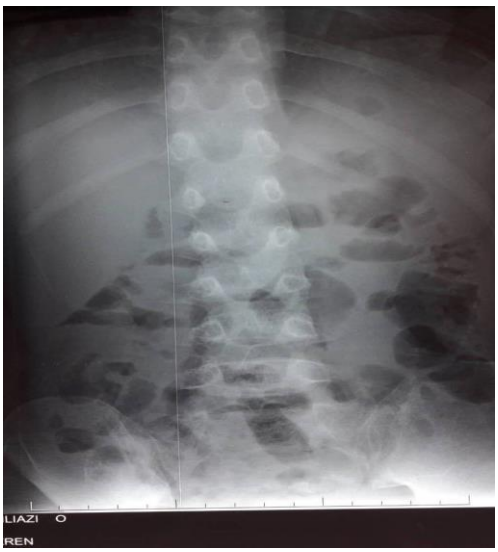

**Figure 2:** X ray – abdomen.

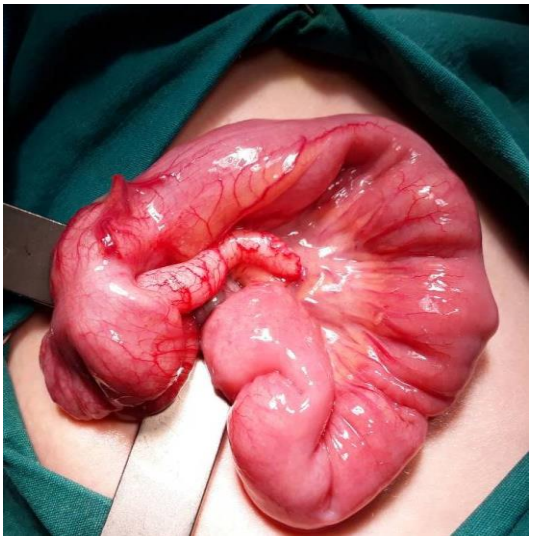

**Figure 3:** The base of the appendix appendix.

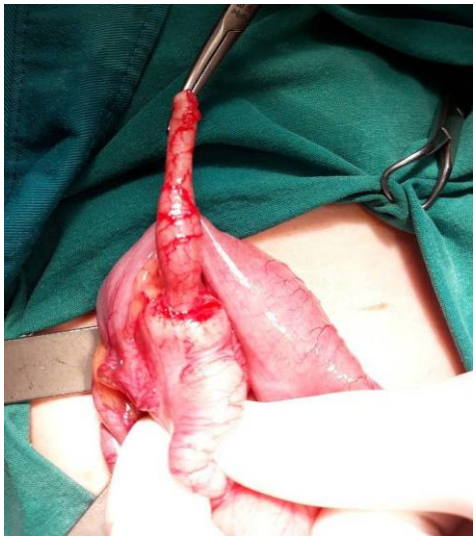

**Figure 4:** Front view of the invaginated invaginated.

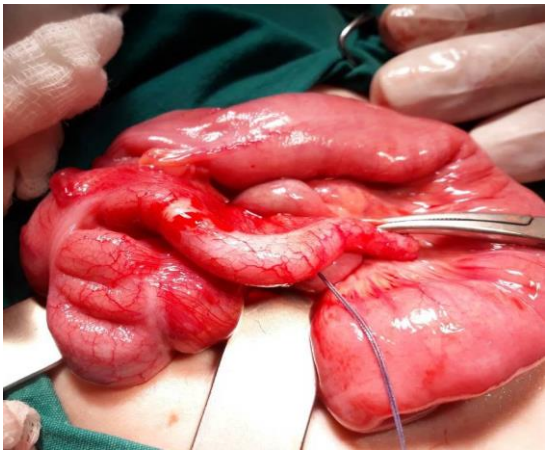

**Figure 5:** Appendix after retraction.

A tubular formation was also described in this region with an 8mm in diameter suspicious for appendiceal intussusceptions (Figure 1). Native X-ray of the abdomen showed a few “small” air-fluid levels in the right lower part of the abdomen (Figure 2). The boy was taken for laparotomy. During surgery we found an intussuscepted appendix with 1/3 of its base invaginated into the cecum (Figures 3-5). Biopsy confirmed dense inflammatory polimorphonuclear, with an intense vascular hyperemia.

## 3. Discussion

The most common causes of appendiceal intussusception in children include Appendiceal inflammation secondary to fecalith, foreign body, hypertrophic lymphoid follicle, parasite, lipoma, and hamartomatous polyp [2]. Other causes seen exclusively in the adult population include mucocele, adenocarcinoma, carcinoid, endometriosis, and metastases [5]. Appendiceal intussusception is particularly rare with an incidence of 0.01% according to a pathologic review of 71,000 human appendix specimens [1].

Different clinical presentations have been described for appendiceal intussusceptions [1].The mainstay of clinical presentation is intermittent abdominal pain while patients may be completely asymptomatic between attacks. Appendiceal intussusception may act as a leading point to ileocolic intussusception, and is frequently concealed by it [3]. Pre-operative diagnosis of intussusception of the appendix is now possible due to the advancement in radiological and endoscopic imaging. In fact, the majority of cases reported after the year 2000 were diagnosed with AI before surgery [3, 4]. Ultrasound has an important role, especially in children [3, 6]. When these entities present concurrently, as in our case, it brings up a “chicken or the egg” type of question, whether the inflamed appendix was the lead point of the intussusception or whether the intussusception caused strangulation and inflammation of the appendix [7]. Beyond the rarity of this diagnosis, this was a challenging case for a variety of reasons. No labs were obtained to evaluate for leukocytosis which might have prompted further discussion of the differential diagnosis [7].Less commonly, appendiceal intussusceptions may also be asymptomatic with incidental diagnosis by variable imaging studies [8]. Longitudinal sonograms may show the inverted appendix protruding into the caecal lumen [6, 9]. Intussusception of the appendix is classified into five anatomic types [10]: type I - invagination of the appendiceal tip; type II - the appendiceal tip is more invaginated to the proximal part of the appendix; type III - intussusception begins at the appendiceal base; type IV - retrograde intussusception; type V - complete appendiceal invagination into the cecum [10]. In our case it was the type III.

The treatment of appendiceal intussusception can be conservative, minimally invasive, and surgical [11, 12]. The intussuscepted appendix may be reduced with a barium enema or air enema. Appendectomy is the treatment of choice in both children and adults [12]. It can be carried out by means of a laparotomy or laparoscopically [11, 12]. Both pediatric surgeons and radiologists should be aware of this occurrence to provide adequate management and avoid complications.

## 4. Conclusion

Appendiceal intussusception should be considered in the differential diagnosis in children with abdominal pain. Both pediatric surgeons and radiologists should be aware of this rare entity as it was presented in our case with type III - intussusception beginning at the appendiceal base and should provide adequate management and avoid complications.

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