Appendiceal intussusception with chronic abdominal pain

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ABSTRACT

Appendiceal intussusception is a rare condition due to partial/total invagination of the appendix into the colon. A 26-year-old woman, with no underlying comorbidities, complained of right lower colicky abdominal pain for the last 8 months. She denied fever, diarrhoea, per-rectal bleeding or significant weight loss. Clinically, the right iliac fossa and suprapubic tenderness were noted with positive rebound tenderness. Ultrasonography of the abdomen revealed invagination of the appendix to the caecum, suggesting appendiceal intussusception. Open appendectomy was performed after failure of reduction through laparoscopic approach. It is important to have a high degree of suspicion to make the diagnosis, especially among young women with chronic abdominal pain.

Keywords

Abdominal pain; appendicitis; chronic pain; intussusception; ultrasonography

INTRODUCTION

Appendiceal intussusception is a rare condition due to partial/total invagination of the appendix into the colon[1]. Although the overall incidence of appendiceal intussusception is unclear, the reported incidence among pathologic specimens taken after appendectomy is 0.01%[2]. Preoperative diagnosis is challenging and typically requires multiple diagnostic imaging studies, including abdominal ultrasound, barium contrast enema, and abdominal computed tomography (CT). Most patients (63%) had a chronic presentation, with waxing and waning symptoms, during a period of weeks to months making the diagnosis enigmatic[3]. Appendiceal intussusception was first classified into 6 types by Moschcowitzis, later modified into 5 types, according to McSwain, which is based on the region of the appendix involved[4,5]. We experience a 26-year-old woman who complained of chronic right lower colicky abdominal pain in which appendiceal intussusception was diagnosed and we highlight our management plan on her.

CASE REPORT

A 26-year-old woman, with no underlying comorbidities, presented to the Emergency Department with complaints of occasional episodes of right lower abdominal pain for the last 8 months. The pain came in bouts of attacks, moderate to severe in intensity, and colicky in nature, with no specific aggravating or relieving factors. It was associated with episodes of vomiting and nausea. No history of fever, loss of appetite, loose stool, per-rectal bleeding or significant weight changes was experienced. On abdominal examination, the right iliac fossa and suprapubic tenderness were noted with positive rebound tenderness. On further evaluation, noted that her blood gas analysis which showed, a pH

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of 7.377, HCO3 23mmol/L, pCO2 of 35.3mmHg and lactate was at 1.2mmol/L, was within normal parameters and showed no signs of acid-base imbalance.

Ultrasonography of the abdomen revealed invagination of the appendix to the caecum, giving off the appearance of concentric alternating echogenic and hypoechoic bands, revealing a target sign, donut or bull's eye sign, which was suggestive of appendiceal intussusception (Figure 1). She was then taken for an emergency diagnostic laparoscopy. Intra-operatively, it was noted that the appendix was fully invaginating into the cecum and was unable to reduce it laparoscopically. Hence, it was converted to open appendectomy by Lanz incision.

Prior to dissection, adhesiolysis was required because of the dense adhesions with early lump formation, which led to an iatrogenic perforation at the base. Open appendectomy was performed after manual reduction by retrograde milking of the intussusceptum (Figure 2). Perforation was repaired and the base was transfixed and buried after appendectomy. Post-procedure a drain was kept at right iliac fossa. A stump leak on postoperative day 2 hindered her recuperation, which was identified by presence of feculent material in the drain. Perforation was identified at caecum near the stump during her emergency exploratory laparotomy, which was what caused the leak. Decision was made for right hemicolectomy with end-to-end ileocolic anastomosis. She improved post-operatively as planned and was discharged after 2 weeks. After a 2-month follow-up, she had no issues and was satisfied with the treatment. The resected specimen was consistent with acute appendicitis.

DISCUSSION

An inverted appendix is often missed by both clinicians and radiologists due to its rarity. Clinically, it can present in a wide spectrum, ranging from no symptoms at all to signs mimicking acute appendicitis, including an acute abdomen[6]. Symptoms may also be vague, such as abdominal discomfort, nausea, vomiting, or fever[7]. In this case, the patient's persistent abdominal pain posed a diagnostic challenge. We considered various differential diagnoses, including colitis, enteritis, inflammatory bowel disease, constipation-related colic, endometriosis, coeliac disease, and chronic mesenteric ischemia. Some could present with Amyand's hernia and paraumbilical hernia[8,9]**.** Inflammation is the most common finding in pediatric (76%) and adult (19%) cases of appendiceal intussusception, then followed by endometriosis and mucocele[3]. Given that histology confirmed acute appendicitis, we suspect the condition to be acquired rather than congenital. Most diagnoses of appendiceal intussusception are made during surgery, though in some cases, it may resemble a colonic polyp during colonoscopy.

Although acute appendicitis is primarily diagnosed clinically, imaging can often provide valuable support. Ultrasound may reveal a classic "target" or "donut" sign, indicative of intussusception[10]. However, due to the absence of clear anatomical landmarks, the intussusception is often misidentified as ileocolic or ileoileal. A central cystic area smaller than 6 mm within the target sign may suggest, though not definitively confirm, appendiceal intussusception[10]. CT may reveal a characteristic feature such as a layered, sausage-shaped mass, and are particularly useful in suspected cases by offering superior anatomical detail and identifying potential complications[11-13]. It can provide better diagnostic value especially in a highly suspicious case. CT imaging further enables direct visualization using isotropic voxel reconstructions in multiple planes, though its limitations include exposure to ionizing radiation and potential contrast-related allergies[14,15]. On barium enema, a "coiled-spring" pattern may be seen. During colonoscopy, an invaginated appendix may appear like a colonic polyp, posing a risk for inadvertent removal and iatrogenic injury. In our case, a preoperative diagnosis was successfully made through ultrasonography.

Several factors must be weighed when determining the appropriate management, including the patient's age, recurrence history, existing comorbidities, possible unexpected complications and potential risk of malignancy[16]. In some instances, spontaneous resolution of the inversion has been reported[7]. Appendectomies, either laparoscopically or via laparotomy remains the standard treatment for inverted appendix. However, this does not guarantee that recurrence will not occur. For patients who experience recurrent intussusception even after appendectomy, a partial cecectomy may be a definitive solution[17]. In our case, the patient had a type V appendiceal intussusception, as classified by McSwain, where the entire appendix had telescoped into the cecum[5,18,19]. In the absence of a pathological lead point, reduction during colonoscopy using air insufflation may be attempted.

In conclusion, appendiceal intussusception is rare with unclear incidence rate. For a young woman who presented with chronic abdominal pain, considering other differential diagnoses, this rare occurrence of appendiceal intussusception must be taken into consideration. A simple ultrasound can assist the preoperative diagnosis, hence subsequent intervention can be undertaken.

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Conflict of interest

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Ethical clearence

Ethical clearance is not required for publication of a case report.

Authors's contribution

Data gathering and idea owner of this study: AAA

Study design: AN, MA

Data gathering: HA, AU

Writing and submitting manuscript: AAA, NFJ

Editing and approval of final draft: HAH, FH

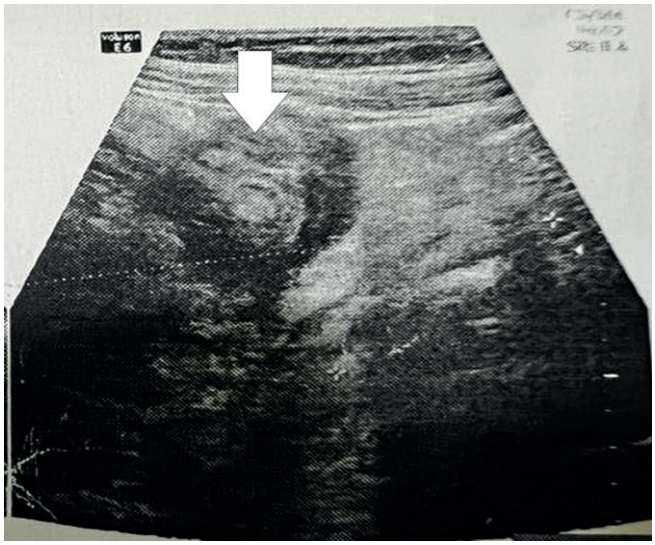

Figure 1: Axial sonogram of the right lower abdominal quadrant shows a target sign (arrow), the inner ring with a prominent central hyperechoic representing the inverted appendix and mesoappendix.

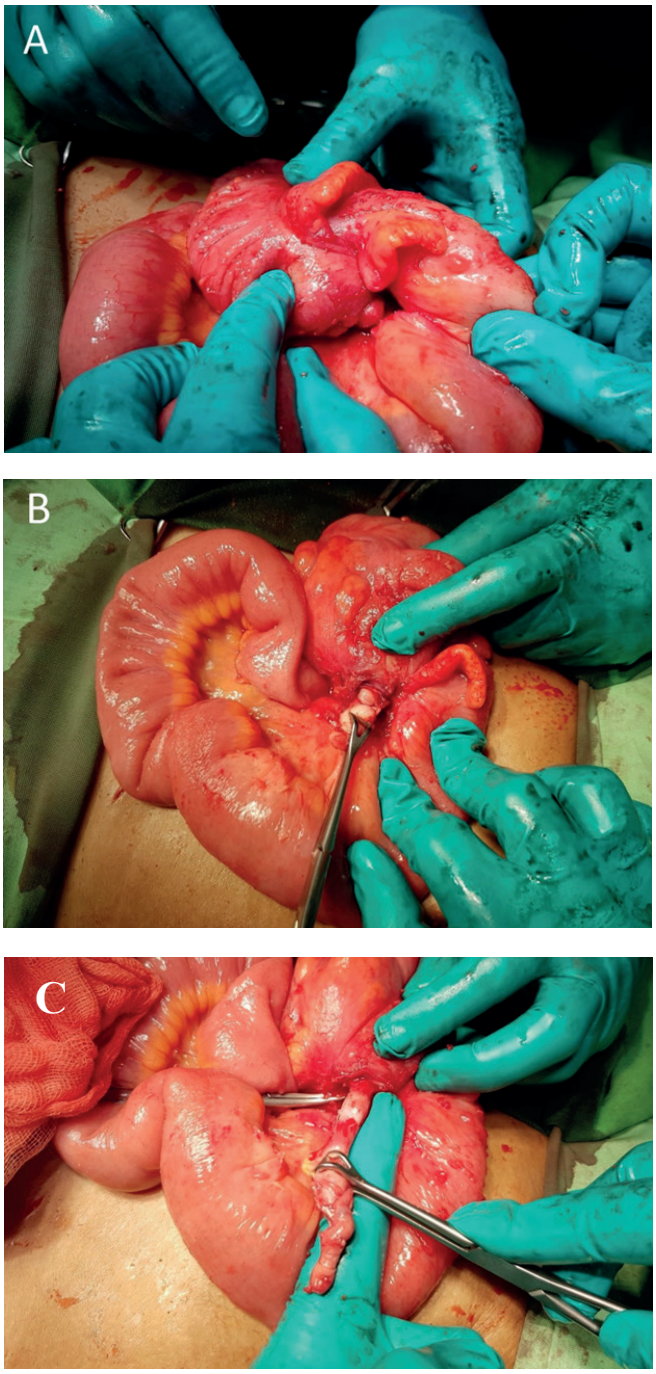

Figure 2: (A) Intraoperative photograph showing a complete inversion of the appendix into the cecum. (B) The body of the appendix was dragged out from the cecum. (C) The appendix was completely dragged out.

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