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Case Report

Missed case of intussusception, a rare cause of abdominal pain in adults: A case report emphasizing the imaging findings and review of the literature

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ABSTRACT

Intussusception, a process whereby a segment of the intestine telescopes into the adjoining intestinal lumen, is a rare source of pain in adults that present with nonspecific abdominal pain. Imaging is the mainstay for diagnosis, which requires prompt and accurate interpretation to prevent complications. The following report details the misdiagnosis of intussusception in a 54-year-old male, whom presented to the emergency department with a 4-day history of nonrelenting abdominal pain, nausea, vomiting, and constipation. Following blood tests, chest, and abdominal imaging, the patient was discharged with a suspected passed renal stone. He soon represented to the General Practitioner, however, with equivalent pain; prompting a review of the images. It was apparent that the initial radiologist failed to recognize the subtle presence of intussusception. This case highlights the necessary consideration of intussusception as a differential diagnosis in adult patients presenting with intermittent abdominal pain. The case further emphasizes that radiologists should be familiar with the subtler signs of intussusception.

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Introduction

Intussusception is a process by which a segment of the intestine invaginates or telescopes into the adjoining intestinal lumen – causing obstruction. The lead point is pulled for-

ward by the natural peristalsis of the bowel, therefore leading to prolapsing of the involved bowel segment into another bowel segment [1,2]. The lead points are the structural lesions of the bowel wall that are thought to alter normal peristaltic activity of the bowel, hence, initiating the prolapsing or invagination process [1,2]. Intussusception is further classified

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according to their location and site of origin; enteric (confined to small bowel), ileocolic, ileocaecal, and colonic (confined to large bowel) [3]. In a previous study of 745 surgically diagnosed intussusception cases in adults, 52% were found in the small bowel and 38% in the large bowel [4]. The classic acute pediatric presentation of intussusception with per rectal bleeding, abdominal pain, and a palpable mass are rarely seen in adults, making the diagnosis difficult to achieve [5]. This can often result in delayed diagnosis and increased morbidity and mortality [6].

This report describes a case of small bowel intussusception that was initially unnoticed in a middle-aged man. Considering imaging is the primary diagnostic modality for cases of intussusception, this case emphasizes the need for radiologists to ensure they are familiar with the clear and subtler radiological signs of this diagnosis.

Case presentation

A 54-year-old gentleman presented to a regional hospital with a 4-day history of worsening central abdominal pain. The sudden onset pain, intermittent in nature, was located in the central, left, and right flank areas, radiating to the groin. The patient additionally reported nausea with episodes of vomiting and constipation. He was, however, still passing bowel motions. He denied chest pain, urinary symptoms, diarrhea, hematochezia, loss of weight, or other constitutional symptoms. He was discharged with analgesia and a plan to present to the emergency department of a tertiary hospital if symptoms worsened. The following day he presented to the emergency department with the same symptoms. His past history consisted of a longstanding right inguinal hernia, gastroesophageal reflux disease, left arteriovenous malformation, epilepsy, and peripheral vascular disease. His single regular medication consisted of carbamazepine.

Examination of the abdomen revealed involuntary guarding from the right upper quadrant of the abdomen to the right suprapubic region. The tenderness was maximal at the right lumbar region. Bilateral uncomplicated inguinal hernias were felt and bowel sounds were present. Examinations of his heart and lungs revealed no abnormalities. His vital signs showed no significant abnormalities. The differential diagnosis at the stage consisted of typical causes of an acute abdomen. The plan was for formal bloods, repeat radiographs of the chest and abdomen, a computed tomography (CT) abdomen/pelvis with contrast, urinalysis, and analgesia. His blood results were unremarkable, with all routine blood results and a venous blood gas showing no abnormalities. Urinalysis revealed a trace of blood and protein, with nil signs of infection.

Chest radiographs showed no significant-detected abnormalities. Additional abdominal radiographs on the same day showed mild levoscoliosis of the lumbar spine, however, no evidence of dilated loops of bowel (see Fig. 1). A CT scan of the abdomen and pelvis with contrast during the early hours of the following day was reported by the radiologist as having no acute abnormalities, with normal bowel, no signs of appendicitis, renal calculi, or abdominal aortic aneurysm. Based on clinical improvement and a “normal” CT scan of the ab-



Fig. 1 – Abdominal radiograph: demonstrating no signs of bowel obstruction, with normal bowel-gas distribution.

domen and pelvis, the patient was subsequently discharged home with a suspected diagnosis of a passed renal stone.

Two days later, the patient represented to his General Practitioner with ongoing intermittent abdominal pain and nausea. The General Practitioner kindly asked the radiology team to recheck the CT images. Two radiologists reviewed the images and concluded that in the left upper quadrant, a loop of thickened, “bowel in bowel,” appearance was seen, consistent with small bowel intussusception with no proximal obstruction. The initial radiologist missed the subtle findings of intussusception, as can be seen below (see Fig. 2a-c). Given the age of the patient it is plausible to assume that the radiologist did not suspect this diagnosis. Considering the patient had been symptom free and had no symptoms of underlying malignancy, he was subsequently referred to the general surgical team who opted for a more conservative treatment. They planned to continue to follow him up in outpatient clinic.

At the time of writing this, the patient continues to be asymptomatic with no further episodes of abdominal pain. The patient has been seen in general surgical outpatient clinic, and it has been postulated that the cause is most likely idiopathic and transient nature. He is to continue to be followed up in clinic.

Discussion

After childhood, the diagnosis of intussusception is relatively rare, with only 5% of all cases emerging in adulthood. Such

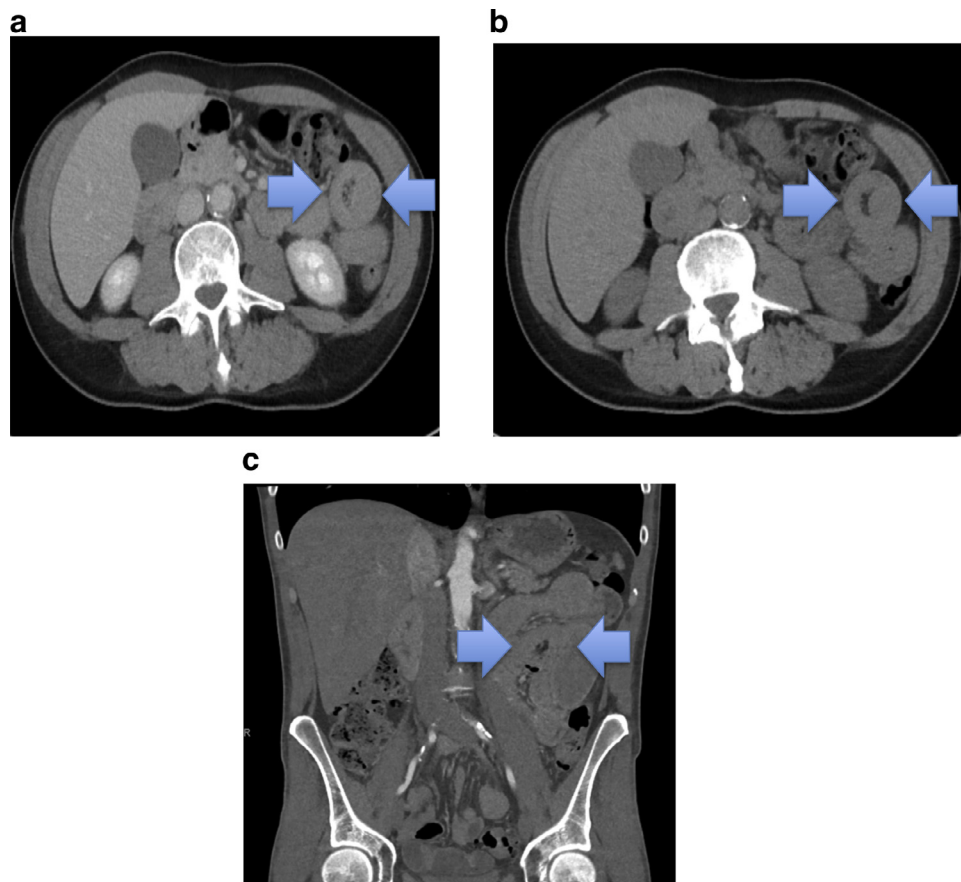


Fig. 2 – Contrast-enhanced axial and coronal computed tomography abdominal and pelvis images: Demonstrating a loop of thickened “bowel in bowel” appearance in the left upper quadrant (blue arrows), consistent with small bowel intussusception, with no evidence of proximal obstruction.

cases are responsible for 1% of all bowel obstructions in this age group [7]. In contrast, in children, intussusception is the most common cause of bowel obstruction. It is usually primary or idiopathic (90% of cases), where the lead point is thought to be due to the development and formation of lymphoid hyperplasia prior to a viral infection [7]. An association between adenovirus and intussusception in children has been identified among multiple populations [8–11]. Intussusception in adults are often due to secondary causes and for most cases, a lead point is identified [10,11]. In contrast, lead points in children are only identified in 25% of cases [10,11]. Adenocarcinoma is the most common lead point (85%) diagnosed overall in adult intussusception, with lipomas being the most common (80%) benign cause [12,13]. In the small bowel, the most common lead point overall was due to metastasis (approximately 50%), and the most common benign lead points were Meckel’s Diverticulum and Peutz-Jeghers syndrome (50%) [12]. Transient small bowel nonobstructive intussusception is commonly idiopathic and compromises around 10% of cases [12].

In children, the typical presentation is abdominal pain that is severe, cramping, sudden onset, and often causes the child to draw their legs up toward their abdomen [14]. Accompanying symptoms typically include vomiting and hematochezia.

The stools are grossly blood in 50% of cases, and an additional 25% of cases tested positive for occult blood [15]. The classic triad as a presentation that is commonly known as pain, a palpable sausage – shaped abdominal mass and red-currant jelly stool is seen in less than 15% of patients at the time of presentation [16,17]. The presentation for adults is markedly different compared to that of children. The classic triad is rarely present and subsequently the presentations are varied among the cases [18]. Frequently, patients may present with vague, chronic, and nonspecific symptoms. Abdominal pain is the most common presenting complaint, being present in 71%-90% of cases [18]. Other common symptoms that patients may report are nausea, vomiting, unexpected changes in bowel habit, abdominal distension, and hematochezia [19]. These symptoms may occur in varying timelines, being either acute, intermittent or chronic, making an accurate and timely diagnosis very difficult. When the intussusception is caused by a malignancy or an accompanying malignancy, the patient may have symptoms such as weight loss, melena, or a palpable abdominal mass [20].

The approach to diagnosis of intussusception in adults and children is different. The diagnosis of adult intussusception is more challenging. Typically, clinicians may use a plain abdominal film as their first imaging modality, and

these images may show features of bowel obstruction, as well as showing information regarding the location of obstruction [21–24]. Upper gastrointestinal series can show a “stacked coin” or “coil-spring” appearance, while a barium enema test would be useful in patients with colonic intussusception. Such patients would show a filling defect in the form of a “cup-shaped,” or either a “spiral” or “coil-spring” as the indicative appearance of an intussusception [21–24]. Additionally, colonoscopy and small bowel enteroscopy can be useful in the diagnosis of intussusception in patients whom are experiencing subacute or chronic bowel obstruction [25]. In contrast, in children, the choice of imaging modality for detection and diagnosis is ultrasonography. The following study showed that the sensitivity of ultrasonography, for evaluating the possibility of intussusception, produced 97.9% sensitivity and 97.8% specificity. Therefore, in children, ultrasonography should be the first line imaging modality used for the evaluation of suspected pediatric intussusception [25].

Abdominal CT scan is considered the best tool for the diagnosis of adult intussusception, as its accuracy reportedly ranges from 58% to 100% according to various studies [2,13,26–29]. In adults with intussusception, CT often demonstrates an early target mass with the fascial planes around the mass retained. This can include bowel wall thickening and the characteristic mass with layering effects (areas of high density with curvilinear low-density zones) [29]. Further indicative features may be traction of the mesenteric vasculature involved with the area of intussusception, edema of the bowel, which as it progresses can obscure the layering effect earlier described. Therefore, the affected bowel may assume a formless shape, surrounded by intraperitoneal fluid. Scattered air-fluid levels would indicate associated bowel obstruction, and intramural air would suggest that the affected bowel now has vascular compromise [29].

The treatment of adult intussusception remains controversial, depending upon whether the etiology is known. There is some evidence to suggest that a CT scan diagnosis of adult intussusception (particularly if transient) does not always require further evaluation. In these instances, intussusception can be treated conservatively (nonsurgically) despite gastrointestinal symptoms [30]. Endoscopic surveillance and imaging are recommended for close follow-up of these patients [30]. In addition, it has been found retrospectively that CT diagnosis of intussusception of a length shorter than 3.5 cm is more likely to be transient and self-limiting in nature [31]. More commonly, however, surgical intervention is employed for intussusception treatment, especially if a lead point is identified. For some cases, initial reduction prior to surgical resection is justified in some enteric intussusceptions. For most cases associated with the colon, however, surgical resection without a prior attempt at reduction is favored due to the high incidence of malignancy [18]. Furthermore, it has been reported in the literature that an attempt at the reduction of small bowel intussusceptions is preferred, as they are less likely to be associated with a primary malignancy. A surgical resection without initial reduction is preferred if the suspicion of malignancy is high. This is suggested to prevent manipulation of any potential malignancy [19].

Conclusion

Although rare, intussusception needs to be considered as a differential diagnosis in adults presenting with abdominal pain. Imaging is the mainstay for intussusception diagnosis. Therefore, radiologists need to be familiar with the clear, and subtler, radiological signs of this diagnosis. The increasing use of CT abdominal imaging has resulted in increased small bowel intussusception detection, where the cause can range from malignancy to a benign, transient occurrence with no underlying cause. In order to reduce morbidity and mortality associated with intussusception, an accurate and timely diagnosis is imperative to guide clinical management. Treatment depends on the underlying cause and can vary from conservative to surgical intervention. Ultimately, a multidisciplinary team approach is crucial to achieve favorable outcomes for patients.

Written informed consent was obtained from the patient for publication of this case report, including accompanying images.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.radcr.2019.05.007](https://doi.org/10.1016/j.radcr.2019.05.007).

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