

DIAGNOSE THIS

Red currant jelly, sausages and donuts

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An otherwise healthy 1-year-old male presents with one-day history of colicky abdominal pain accompanied by inconsolable crying and drawing up of the legs towards the abdomen. His presentation is also significant for lethargy, watery bloody diarrhea and non-bilious vomiting for the past four days. An abdominal X-ray is shown below (Figure 1).

Choose the BEST answer:

- A. This diagnosis is most likely at the ileo-colic junction
- B. This condition is best diagnosed on abdominal plain film
- C. The "classic triad" for this diagnosis includes abdominal pain, vesicular rash and red currant-jelly stool
- D. This diagnosis is common in adults, and may indicate more of a pathologic process in children.
- E. The recurrence rate for this diagnosis is as high as 80% in idiopathic cases.



Figure 1. Abdominal X-ray. What does the arrow indicate?

Answer

The correct answer is "A".

Clinical features

Intussusception is best described as the telescoping of the bowel, where a part of the intestine invaginates into itself. It is most commonly seen at the ileo-colic junction. Most cases of intussusception are diagnosed in children younger than two years of age.¹ Approximately 90% of cases are regarded as idiopathic; however, it is speculated that intussusceptions may be due to the lymphoid hyperplasia secondary to viral illnesses, as there is an increased number of cases in the spring and autumn.¹ Intussusception may also be secondary to lead points caused by entities such as Meckel's diverticulum, Peutz-Jegher's syndrome, mesenteric cysts, intramural hematoma and lymphoma.¹

Clinically, patients with intussusception typically develop sudden onset of abdominal pain that is intermittent and severe in nature, and may be seen pulling their legs towards their abdomen during these acute episodes. Vomiting can accompany or follow episodes of abdominal pain. Between the colicky episodes of abdominal pain, a child may feel well and free of pain. The classic triad of intussusception includes a palpable sausage shaped abdominal mass, abdominal pain and currant-jelly stool, but it is typically seen in less than 20% of patients at the time of presentation.²

Imaging studies

Abdominal ultrasound is the preferred method of diagnosing intussusception, with the sensitivity and specificity of 98.4% and 96.4% respectively, in the hands of an experienced sonographer.³ It can be used to assess vascular perfusion and detect free fluid within the peritoneal cavity. On Doppler ultrasound in the axial view, a "doughnut" or a "target" sign can be seen, showing concentric rings of the bowel wall (Figure 2). Of note, the presence of vascularity of both bowel walls is reassuring for viability (Figure 2). On a longitudinal ultrasound scan, a "pseudo-kidney" sign is visualized, composed of the central invaginated bowel (intussusceptum) and the surrounding bowel (intussusciens) (Figure 3).¹

Abdominal X-rays are often performed as part of an evaluation of a patient with abdominal symptoms; however, they are less sensitive (62.2%) and specific (86.7%) for the diagnosis of intussusception.³ Some of the radiologic features of intussusception on an abdominal plain film include:

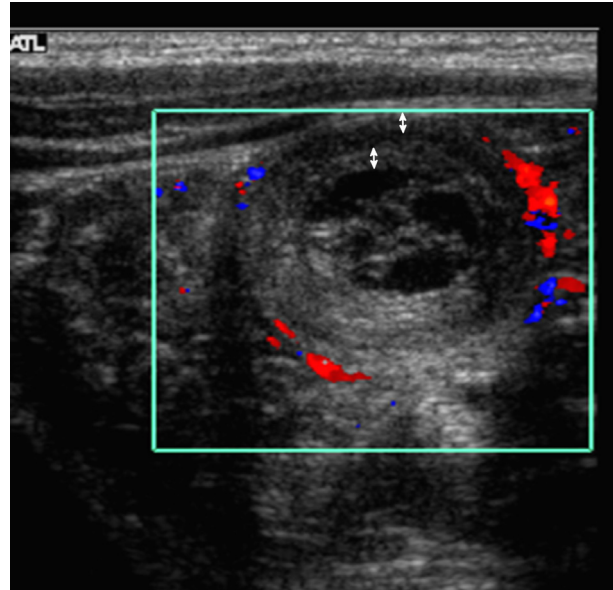


Figure 2. Abdominal Doppler ultrasound, transverse view. There is fluid and echogenic material trapped inside the intussusception. Arrows indicate the concentric layers of the bowel walls.



Figure 3. Abdominal ultrasound, longitudinal view. Pseudo-kidney sign can be seen here. Arrow A indicates the intussusciens, while arrow B indicates the intussusceptum.

- Target sign: concentric radiolucent circular lines usually found in the right upper quadrant
- Crescent or meniscus sign: soft tissue density representing the intussusception projecting into the gas of the large bowel (Figure 1).¹

Management

Intussusception is considered a pediatric emergency, as it should be treated promptly due to the risk of bowel ischemia and perforation. Non-surgical reduction methods offer successful reduction of intussusception without the risks of anesthesia and surgery. The non-surgical treatments of choice include reduction methods with hydrostatic material (barium, water soluble contrast, saline) or air enema for stable patients without contraindications. However, surgery should be consulted prior to the reduction in the event a complication should arise. Complications of non-surgical reduction include less than 1% risk of perforating the bowel.⁴ Pneumatic reduction technique provides an advantage over the barium reduction in this instance, as air is less harmful than barium in the peritoneal cavity.⁴ Delayed repeated attempts may be successful in children who remain clinically stable without signs of peritonitis and in which the intussusception shows partial reduction on the initial attempt.⁴

Prior to reduction by enema, the patient should initially be stabilized and resuscitated with intravenous fluids.⁴ For pneumatic reduction, a Foley catheter is inserted into the rectum, and air is used to push the intussusception back. Under fluoroscopic or, less commonly, sonographic guidance, the intussusception can easily be detected, with the sudden air reflux into small bowel indicating a successful reduction (Figure 4).¹ Clinical indicators of a successful reduction include relief of symptoms and disappearance of the abdominal mass.

After a non-surgical reduction, it is important to inform patients that the intussusception may recur in

approximately 10% of the time, and most often within 24 hours after reduction.⁴

Contraindications for a non-surgical reduction of intussusception include patients with clinical evidence of dehydration, shock, peritonitis, bowel perforation or necrosis.⁴ Dehydration and shock must be corrected before an enema can be performed safely. In the case of peritonitis and bowel perforation, surgery is indicated. Manual reduction during the operation is likely to be attempted first, but resection with primary anastomosis is sometimes required.⁴

Intussusception may also resolve spontaneously without any intervention in about 17% of cases.⁵ More than half of these patients are asymptomatic and the intussusception is found incidentally.⁵ Some factors predisposing to intussusception with spontaneous resolution include the intussusception being limited to the small bowel, and the intussusception being less than 2.3 cm.⁵ In select asymptomatic patients with a short intussusception limited to the small bowel, conservative observation may be appropriate.⁵

References

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Figure 4. Sequential images demonstrating pneumatic reduction under fluoroscopic guidance (A-C, black arrows). Air reflux into the terminal ileum is reassuring for a successful reduction (C).