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. 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. 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.

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.

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. 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 (intussuscipiens) (Figure 3).

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. Some of the radiologic features of intussusception on an abdominal plain film include:
Diagnose This: red currant jelly, sausage and donuts

usually found in the right upper quadrant

representing the intussusception projecting into the
gas of the large bowel (Figure 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. Pneumatic reduction technique
provides an advantage over the barium reduction
in this instance, as air is less harmful than barium in
the peritoneal cavity. 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.

Prior to reduction by enema, the patient should
initially be stabilized and resuscitated with intravenous
fluids. 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). 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.

Contraindications for a non-surgical reduction of
intussusception include patients with clinical evidence
of dehydration, shock, peritonitis, bowel perforation or
necrosis. 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.

Intussusception may also resolve spontaneously
without any intervention in about 17% of cases. More
than half of these patients are asymptomatic and the
intussusception is found incidentally. 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. In select asymptomatic patients with
a short intussusception limited to the small bowel,
conservative observation may be appropriate.

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).