Intussusception occurs when a distal segment of bowel telescopes into the lumen of proximal bowel. This can happen at any age, but is most common in infants between three and eighteen months. It is the most common cause of bowel obstruction in three months of age to six year old children. This article gives you brief information about the epidemiology, etiology, pathology, signs and symptoms, diagnosis and treatment of pediatric intussusception.
Definition and Epidemiology of Pediatric Intussusception

Intussusception occurs when a distal segment of bowel telescopes into the lumen of a proximal bowel, causing bowel obstruction. Intussusception can occur at any age; however, it is most common in infants between 3 and 18 months of age. It rarely occurs in neonates. Males are more commonly affected with a male to female ratio of 3:1.

Intussusception is the most common cause of bowel obstruction in children between 3 months of age and 6 years of age.
Etiology of Pediatric Intussusception

In about 90% of cases of intussusception in children, the cause is idiopathic. In 2-8% of cases, an underlying structural cause is identified, so-called “lead points,” such as a Meckel diverticulum, neurofibroma, intestinal polyp, hemangioma or a malignancy such as a lymphoma. Lead points are more commonly a cause in older children presenting with intussusception.

A proposed etiologic mechanism is a gastrointestinal infection or new food proteins that lead to inflammation of Peyer patches in the terminal ileum. Other risk factors include lymphoid hyperplasia and cystic fibrosis.

There is also an association between respiratory adenovirus infection and intussusception. Various conditions may also be complicated by intussusception, such as gastroenteritis, otitis media, upper respiratory tract infections and Henoch-Schonlein purpura.

Pathology and Pathophysiology of Pediatric Intussusception

Intussusception most commonly occurs in the ileocolic region of the bowel. Less common forms of intussusception are cecocolic and, rarely, ileoileal. In very rare cases, the appendix may serve as the apex of an intussusception.

The proximal segment of the bowel that invaginates into the lumen of the distal segment of the bowel is called the intussusceptum, while the distal segment is called the intussuscipiens.

The intussusceptum pulls its mesentery along into the distal lumen with it. The mesentery is constricted and this leads to obstruction of venous return. The intussusceptum becomes engorged with the development of edema. The mucosa bleeds and this results in blood stool, which may also contain mucus (“red currant jelly” stool). Intussusception can eventually result in gangrene of the bowel and shock. Strangulation usually occurs after 24 hours.

In some cases of intussusception, the apex may extend further into the transverse, descending or sigmoid colon. In neglected cases, the apex of the intussusception may
even descend through the anus.

Symptoms and Signs of Pediatric Intussusception

Symptoms

- Abdominal pain: colicky, severe, and intermittent abdominal pain.
- Vomiting: initially nonbilious and reflexive but when obstruction occurs becomes bilious.
- Lethargy
- Redcurrant jelly stools

Infants with intussusception experience an abrupt onset of intermittent attacks of colicky abdominal pain and screaming. During these episodes, they become pale and may draw up their legs. These episodes of pain usually last for 2 to 3 minutes, and occur intermittently, about every 10 to 20 minutes.

Later, the pain becomes more persistent. In between episodes, the infant may appear comfortable and well but, as the intussusception progresses, the infant starts to become lethargic and weak. Lethargy may be a more prominent feature than abdominal signs in some infants.

Other symptoms include vomiting, which is the most common accompanying symptom and occurs early on. Later, the vomiting becomes bilious. Infants may also initially pass a small number of loose stools; this is an early feature of bowel obstruction, with emptying of the bowel distal to the point of obstruction. Subsequently, small amounts of stool may be passed or more commonly, obstipation develops, with no passage of stool and flatus.

Per rectal bleeding generally occurs in the first 12 hours. Intussusception is also classically associated with redcurrant jelly stools, but this is a late feature. This refers to stool containing mucus and blood.

Signs

Infants may appear pale, lethargic and unwell. There may be a sausage-shaped mass palpable, or even visible, in the abdomen. The mass is slightly tender and is usually present in the right or left upper quadrants. However, when the abdomen becomes distended, this may be more difficult to appreciate. Rectal examination may reveal PR bleeding or a mass.

The classic triad suggestive of intussusception includes abdominal pain, a sausage-shaped abdominal mass, and redcurrant jelly stool. However, this is only present in a small number of cases (<15%).

<table>
<thead>
<tr>
<th>Abdominal exam</th>
<th>Rectal exam</th>
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<tbody>
<tr>
<td>• Palpable sausage-shaped mass</td>
<td>• Red currant jelly stool (mixed with blood and mucus)</td>
</tr>
<tr>
<td>• Right upper quadrant</td>
<td>• Later exam finding</td>
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</tbody>
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Diagnosis and Differential Diagnosis of Pediatric
Intussusception

The diagnosis of intussusception is based on a combination of clinical findings and imaging.

Radiology

A plain abdominal X-ray may be normal or reveal a density in the region of the intussusception. It may also show features of bowel obstruction, and is helpful in excluding bowel perforation.

Ultrasound

An abdominal ultrasound is often the most helpful diagnostic test in cases of intussusception. Longitudinal views reveal a tubular mass, while transverse views show a target appearance.

Other tests

When there is clinical suspicion or evidence on ultrasound of intussusception, an air enema is performed for diagnostic and therapeutic purposes. Alternatives include a hydrostatic (saline), water-soluble contrast or barium enema.

Clinical pictures similar to intussusception:

![Image: A volvulus is a twisting of the intestine that can occur in childhood. It causes a blockage, and may cut off blood flow and damage part of the intestine. by آرﻣﯿﻦ - Own work. License: Public Domain]

**Volvulus** (another cause of small bowel obstruction, when the bowel becomes twisted, and in infants, this can be secondary to malrotation).

**Strangulated inguinal hernia** (also another cause of small bowel obstruction; on examination, the groin has a tender irreducible lump).

**Gastroenteritis** (the presence of loose stools may resemble gastroenteritis, but the key distinguishing feature is the volume and persistence of diarrhea).

**Colic** (the infant is found to be healthy and thriving, with a normal exam).
Therapy of Pediatric Intussusception

Treatment is achieved with an air enema, which reduces the intussusception. A successful reduction of the intussusception is indicated when there is a sudden flow of gas into the ileum. If there is only a partial reduction, the air enema can be repeated a little while later. An alternative to an air enema is a barium enema, but this is less effective.

If an enema is unsuccessful, surgery is indicated. Surgery is also carried out in cases of a suspected necrotic bowel, suggested by features such as peritonitis and septicemia.

Progression and Prognosis of Pediatric Intussusception

Some cases of intussusception spontaneously reduce. However, most untreated cases ultimately result in death. Intussusception progresses to bowel infarction and can result in bowel perforation and peritonitis.

Most patients recover when the intussusception is reduced in the first 24 hours. After the first 24 hours, the mortality rate increases. With early diagnosis and appropriate treatment, the mortality rate is less than 1%. However, if left untreated, the condition is usually fatal after 2-5 days.

The recurrence rate following reduction with an air enema is about 9%.

Review Question on Pediatric Intussusception

The correct answer can be found below the references.

Intussusception in an infant is usually corrected by which of the following measures?

A. Appendectomy
B. Laparotomy
C. Air enema
D. Antibiotics
E. Supportive measures

References


Correct answer: C

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