

**Date:** 14 April 2018 5:50 pm  
**Topic:** Intussusception

Intussusception occurs when a portion of the alimentary tract is telescoped into an adjacent segment. It is the most common cause of intestinal obstruction between 3 mo and 6 yr of age. Sixty percent of patients are younger than 1 yr, and 80% of the cases occur before 24 mo; it is rare in neonates. The incidence varies from 1 to 4/1,000 live births. The male:female ratio is 4:1. A few intussusceptions reduce spontaneously, but if left untreated, most will lead to intestinal infarction, perforation, peritonitis, and death.

#### ETIOLOGY AND EPIDEMIOLOGY.

The cause of most intussusceptions is unknown. The seasonal incidence has peaks in spring and autumn. Correlation with prior or concurrent respiratory adenovirus (type C) infection has been noted, and the condition may complicate otitis media, gastroenteritis, **Henoch-Schönlein purpura**, or upper respiratory tract infections. The risk of intussusception in infants  $\leq 1$  yr of age after receiving a no longer available tetravalent rhesus-human reassortant rotavirus vaccine within 2 wk of immunization was increased. The risk is much greater after the 1st dose of the vaccine compared with the risk after the 2nd dose. The Advisory Committee on Immunization Practices no longer recommends this vaccine. Although rotavirus produces an enterotoxin, there is no association between wild-type human rotavirus and intussusception. The currently approved rotavirus vaccines may not be associated with an increased risk of intussusception (see Chapter 262).

It is postulated that gastrointestinal infection or the introduction of new food proteins results in swollen Peyer patches in the terminal ileum. Lymphoid nodular hyperplasia is another related risk factor. Prominent mounds of lymph tissue lead to mucosal prolapse of the ileum into the colon, thus causing an intussusception. In 2–8% of patients, **recognizable lead points** for the intussusception are found, such as a Meckel diverticulum, intestinal polyp, neurofibroma, intestinal duplication, hemangioma, or malignant conditions such as lymphoma. Intussusception can complicate mucosal hemorrhage, as in Henoch-Schönlein purpura or hemophilia. Cystic fibrosis is another risk factor. Postoperative intussusception is ileoileal and usually occurs within 5 days of an abdominal operation. Lead points are more common in children  $>2$  yr of age. Intrauterine intussusception may be associated with the development of intestinal atresia. Intussusception in premature infants is rare.

#### PATHOLOGY.

Intussusceptions are most often ileocolic, less commonly cecocolic, and rarely exclusively ileal. Very rarely, the appendix forms the apex of an intussusception. The upper portion of bowel, the **intussusceptum**, invaginates into the lower, the **intussusciptum**, pulling its mesentery along with it into the enveloping loop. Constriction of the mesentery obstructs venous return; engorgement of the intussusceptum follows, with edema, and bleeding from the mucosa leads to a bloody stool, sometimes containing mucus. The apex of the intussusception can extend into the transverse, descending, or sigmoid colon, even to and through the anus in neglected cases. This presentation must be distinguished from rectal prolapse. Most intussusceptions do not strangulate the bowel within the 1st 24 hr but may later eventuate in intestinal gangrene and shock.

#### CLINICAL MANIFESTATIONS.

In typical cases, there is sudden onset, in a previously well child, of severe paroxysmal colicky pain that recurs at frequent intervals and is accompanied by straining efforts with legs and knees flexed and loud cries. The infant may initially be comfortable and play normally between the paroxysms of pain; but if the intussusception is not reduced, the infant becomes progressively weaker and lethargic. At times, the lethargy is out of proportion to the abdominal signs. Eventually, a shocklike state, with fever, can develop. The pulse becomes weak and thready, the respirations become shallow and grunting, and the pain may be manifested only by moaning sounds. Vomiting occurs in most cases and is usually more frequent in the early phase. In the later phase, the vomitus becomes bile stained. Stools of normal appearance may be evacuated in the 1st few hours of symptoms. After this time, fecal excretions are small or more often do not occur and little or no flatus is passed. Blood is generally passed in the 1st 12 hr, but at times not for 1–2 days, and infrequently not at all; 60% of infants pass a stool containing red blood and mucus, the currant jelly stool. Some patients have only irritability and alternating or progressive lethargy.

Palpation of the abdomen usually reveals a slightly tender sausage-shaped mass, sometimes ill defined, which may increase in size and firmness during a paroxysm of pain and is most often in the right upper abdomen, with its long axis cephalocaudal. If it is felt in the epigastrium, the long axis is transverse. About 30% of patients do not have a palpable mass. The presence of bloody mucus on the finger as it is withdrawn after rectal examination supports the diagnosis of intussusception. Abdominal distention and tenderness develop as intestinal obstruction becomes more acute. On rare occasions, the advancing intestine prolapses through the anus. This prolapse can be distinguished from prolapse of the rectum by the separation between the protruding intestine and the rectal wall, which does not exist in prolapse of the rectum.

Ileoileal intussusception may have a less typical clinical picture, the symptoms and signs being chiefly those of small intestinal obstruction. **Recurrent intussusception** is noted in 5–8% and is more common after hydrostatic than surgical reduction. Chronic intussusception, in which the symptoms exist in milder form at recurrent intervals, is more likely to occur with or after acute enteritis and can arise in older children as well as in infants.

#### TREATMENT.

Reduction of an acute intussusception is an emergency procedure and performed immediately after diagnosis in preparation for possible surgery. In patients with prolonged intussusception with signs of shock, peritoneal irritation, intestinal perforation, or pneumatosis intestinalis, reduction should not be attempted.

The success rate of radiologic hydrostatic reduction under fluoroscopic or ultrasonic guidance is ~50% if symptoms are present longer than 48 hr and 70–90% if reduction is done in the 1st 48 hr. Bowel perforations occur in 0.5–2.5% of attempted barium and hydrostatic (saline) reductions. The perforation rate with air reduction ranges from 0.1 to 0.2%.

An **ileoileal intussusception** is best demonstrated by abdominal ultrasonography. Reduction by instillation of contrast agents, saline, or air may not be possible. Such intussusceptions can develop insidiously after bowel surgery and require reoperation if they do not spontaneously reduce. If manual operative reduction is impossible or the bowel is not viable, resection of the intussusception is necessary, with end-to-end anastomosis.

#### PROGNOSIS.

Untreated intussusception in infants is usually fatal; the chances of recovery are directly related to the duration of intussusception before reduction. Most infants recover if the intussusception is reduced in the 1st 24 hr, but the mortality rate rises rapidly after this time, especially after the 2nd day. Spontaneous reduction during preparation for operation is not uncommon.

The **recurrence rate** after reduction of intussusceptions is ~10%, and after surgical reduction it is 2–5%; none has recurred after surgical resection. Corticosteroids may reduce the frequency of recurrent intussusception. Recurrent intussusception can usually be reduced radiologically. It is unlikely that an intussusception caused by a lesion such as lymphosarcoma, polyp, or Meckel diverticulum will be successfully reduced by radiologic intervention. With adequate surgical management, operative reduction carries a very low mortality rate in early cases.







