Intussusception and Acute Abdominal Pain in a Toddler

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This condition involves the invagination of a proximal segment of bowel (the intussusceptum) into a
more distal segment (the intussuscipiens) (A). It occurs most frequently in infants between the ages
of 5 and 12 months and is a leading cause of intestinal obstruction in children aged 2 months to 5
years. Intrauterine intussusception is associated with the development of intestinal atresia. The male
to female ratio is approximately 3:2. Intussusception is slightly more common in white than in black
children and is often seen in children with cystic fibrosis. In most patients with intussusception, the
cause is unknown, although some experts believe that hypertrophy of Peyer patches from an
antecedent viral infection may be responsible. Recognizable pathologic lead points for
intussusception are found in about 2% to 10% of patients. The most common is a Meckel
diverticulum, followed by intestinal polyp, duplication, appendix, ectopic pancreas, enterogenous
cyst, hemangioma, intramural hematoma, foreign body, and neoplastic lesion. Insipidated secretions
and thick fecal matter in the bowel lumen may act as a lead point. More than 80% of cases of
intussusception are ileocolic. The ileocolic, jejunoileal, cecocolic, colocolic, and jejunojejunal varieties
occur less frequently. Typical presenting features include colicky abdominal pain, irritability,
lethargy, vomiting, and passage of "currant-jelly" stool. The characteristic stool suggests that venous
congestion--with ischemia in the affected area of the bowel--has already occurred. Children with
intussusception sometimes also have fever and diarrhea, which may create diagnostic confusion and
delay. The pathognomonic sign is an elongated mass in the right upper quadrant or epigastrium with
a feeling of emptiness in the right lower quadrant (Dance sign). If the intussusception has traveled
far enough, its apex may be felt, especially on bimanual rectal examination. Plain abdominal
radiographs may show dilated loops of intestine, air-fluid levels, paucity of air in the right lower
quadrant, minimal fecal content, and a soft tissue mass in the right or mid abdomen. Abdominal
ultrasonography is a sensitive noninvasive diagnostic tool and is very reliable in experienced hands.
The diagnostic findings include a tubular mass ("sandwich" or "pseudokidney" sign) in longitudinal
views and a target appearance ("doughnut" sign) in transverse views. If doubt remains, the diagnosis
can be confirmed by radiography with barium or air insufflation; both procedures are diagnostic as
well as therapeutic. A barium enema shows a filling defect or cupping in the head of barium, where
its advance is obstructed by the intussusceptum (B). An air enema (C), however, is the procedure of
choice: it is safer, less expensive, and easier to perform than a barium enema and involves less
radiation exposure. The reduction rate with an air enema is approximately 80%; the bowel
perforation rate ranges from 0.1% to 0.2%. For barium enema, the reduction rate is 75% to 85%; the
bowel perforation rate is 0.5% to 2.5%. Air pressure must be monitored during air reduction; the
maximum is 110 mm Hg in children and 80 mm Hg in infants. Both types of reduction should be
attempted only under controlled conditions. Evidence of peritonitis, intestinal perforation, shock,
advancing sepsis, and possible gangrenous bowel precludes pneumatic or hydrostatic reduction.
Unsuccessful pneumatic or hydrostatic reduction, shock, peritonitis, intestinal perforation, and
demonstration of a pathologic lead point are indications for laparotomy. Preoperative measures
include nasogastric decompression and administration of intravenous fluids and broad-spectrum
antibiotics. Reduction can usually be accomplished by gentle distal pressure, which milks the
intestine out of the intussuscipiens. Pulling out the intussusceptum should never be attempted. An
appendectomy is performed after reduction, because the blood supply to the appendix is often
compromised. Bowel resection is indicated if the bowel is nonviable, a pathologic lead point is found,
or the reduction is unsuccessful. A primary end-to-end anastomosis can usually be performed after
the resection. The likelihood of recovery is directly related to the duration of intussusception before
reduction; most infants recover if reduction occurs within the first 24 hours. The recurrence rate of intussusception is between 8% and 12% after an air or barium reduction and about 2% to 5% after surgical reduction. There are no recurrences after surgical resection. Infants with untreated intussusception usually die of hypovolemia and the associated intestinal obstruction.

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