Intussusception

Intussusception is the most common cause of intestinal obstruction in children between the ages of 3 months and 3 years. It is more common in boys, and presents with episodic abdominal pain along with diarrhea. Patients have characteristic red, currant jelly stools, while physical exam findings can include a sausage-shaped mass. Conservative treatment of this disorder involves air or hydrostatic enema, while surgical reduction may be done for complicated or refractory cases, as this is a potentially life threatening issue. The rotavirus vaccine is contraindicated in patients with a history of intussusception.



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Pathophysiology

Telescoping of Bowel Segments

Telescoping Bowel-bowl

Telescoping of Bowel Segments is also known as intussusception and occurs when the intestine folds into itself and causes intestinal obstruction. It occurs most commonly at the ileocecal junction. Telescoping is most commonly idiopathic, but it can involve a lead point like Peyer Patch hypertrophy, Neoplasm or Meckels' Diverticulum.

Lead Point

Leader Pointing

Intussusception is rare in adults and is typically due to a pathological lead point. A lead point is an area in which normal peristalsis gains traction to cause the bowel to invaginate. Intussusception in adults is typically caused by a lead point, but is only caused by a lead point 10% of the time in children. Lead points include the appendix, polyps, hyperplasia of Peyer's Patches, Neoplasm, Meckels' Diverticulum, but most cases overall do not involve a lead point.

Assessment

Episodic Abdominal Pain

Episode causing Abdominal Pain-bolt

Episodic abdominal pain is caused by the process of one segment of the bowel telescoping into another segment during intestinal peristalsis. While telescoping is most often idiopathic in nature, a Meckel diverticulum, viral infections, and the rotavirus vaccine can all cause lead points for telescoping. It is painful because this telescoping results in ischemia. The pain may cause the patients to pull their knees to their chest.

Diarrhea

Toilet

Patients are irritable and have diarrhea with intussusception, especially if associated with other intestinal pathologies.

Sausage-Shaped Mass

Sausage

On physical exam during palpation, these children can have a "sausage-shaped" mass, which is typically found in the right upper quadrant (RUQ). Furthermore, there is no fullness in the bowel, and there is an empty right lower quadrant (RLQ), otherwise known as "Dance's sign." On ultrasound, which is a reliable screening tool in low-risk patients, this mass may be seen as concentric echogenic bands formed by mucosa and muscularis alternating with hypoechoic bands formed by submucosa, otherwise described as "target sign, doughnut sign, or bull's eye sign".

Red Currant Jelly Stools

Red Currant Jelly on Stool

With the telescoping that occurs in intussusception, arterial blood flow stops, leading to ischemia and pouring of mucus into the intestine. Venous engorgement also occurs, and together these processes form a mix of blood, mucus, and stool typically described as "red, currant jelly stools."

Diagnosis

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Ultrasound/CT

Ultrasound-machine and Cat-scanner

Diagnosis of intussusception is typically made by CT or ultrasound after a clinical suspicion is established. Characteristic findings include the “Target Sign” when seen in the sagittal view, but will appear as a sausage in the coronal view. Usually ultrasound is done first and CT reserved for cases in which a pathological lead point can not be identified or an ultrasound is inconclusive.

Target Sign

Target Sign

Upon ultrasound or CT of a patient with intussusception, a picture that appears similar to a target will be seen in sagittal view (looking from the side). This picture represents layers of intestine inside intestine. The mass may be radiologically described as concentric echogenic bands formed by mucosa and muscularis alternating with hypoechoic bands formed by submucosa. Terms for this sign include “target sign, doughnut sign, or bull’s eye sign” .

Considerations

More Common in Children

Children

The majority of cases of intussusception are in infants, typically between 6 and 36 months of age. 60% of cases are in individuals less than a year old, and 90% of cases are under 2 years old. Intussusception is uncommon in adults and is usually due to an intraluminal mass acting as a lead point in adults.

Rotavirus Vaccine Contraindicated

Rotor-virus and Syringe with Caution-tape

In patients with a history of intussusception the rotavirus vaccine is contraindicated. The rotavirus vaccine is usually administered at ages 2, 4 and 6 months. In patients with no history of intussusception the risk of severe gastroenteritis outweighs the risk of inducing intussusception.

Management

Air or Hydrostatic Enema

Air and Hydra-static with Enema-Emma

A conservative management technique involves air or hydrostatic enema. An air enema is performed by instilling air into the colon via catheter until it becomes so full that the telescoped bowel is pushed back into a normal position. A hydrostatic enema can be performed by instilling a crystalloid solution into the bowel and has a similar effect. Barium enemas are typically avoided as they can cause peritonitis if bowel perforation occurs.

Surgical Reduction

Surgeon with scalpel

If other conservative treatments are unsuccessful, the child may require surgical intervention. Here, the invagination (telescoping) is manually reduced, and nonviable intestine is resected. This is typically done laparoscopically, but can be done using the open surgical approach if the patient has excessive adhesions.

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