

A 3-year-old boy is brought to the emergency department with abdominal pain. The pain began several hours ago and comes and goes. During these episodes, he "holds his belly," screams, and draws up his legs. He had nonbloody, nonbilious vomiting 3 times since the last painful episode. Between the episodes, the boy has no pain and is playful. His last bowel movement was yesterday and was normal. Two weeks ago, he had gastroenteritis that resolved after 3 days. He otherwise has no medical problems and takes no medications. His temperature is 37.2 C (99 F), blood pressure is 95/50 mm Hg, pulse is 100/min, and respirations are 18/min. The child is alert and cooperative. Abdominal examination shows a soft abdomen that is tender with voluntary guarding to palpation at the right upper and lower quadrants. Rectal examination shows no fissures or hemorrhoids. Fecal occult blood test is positive. The remainder of his examination is normal. Ultrasound of the right upper quadrant is shown in the image below.



What is the best next step in management of this patient?

- ☐ A. Air enema
- ☐ B. Computed tomography of the abdomen
- ☐ C. Exploratory laparotomy
- ☐ D. Observation
- ☐ E. Technetium-99m pertechnetate scan

Submit

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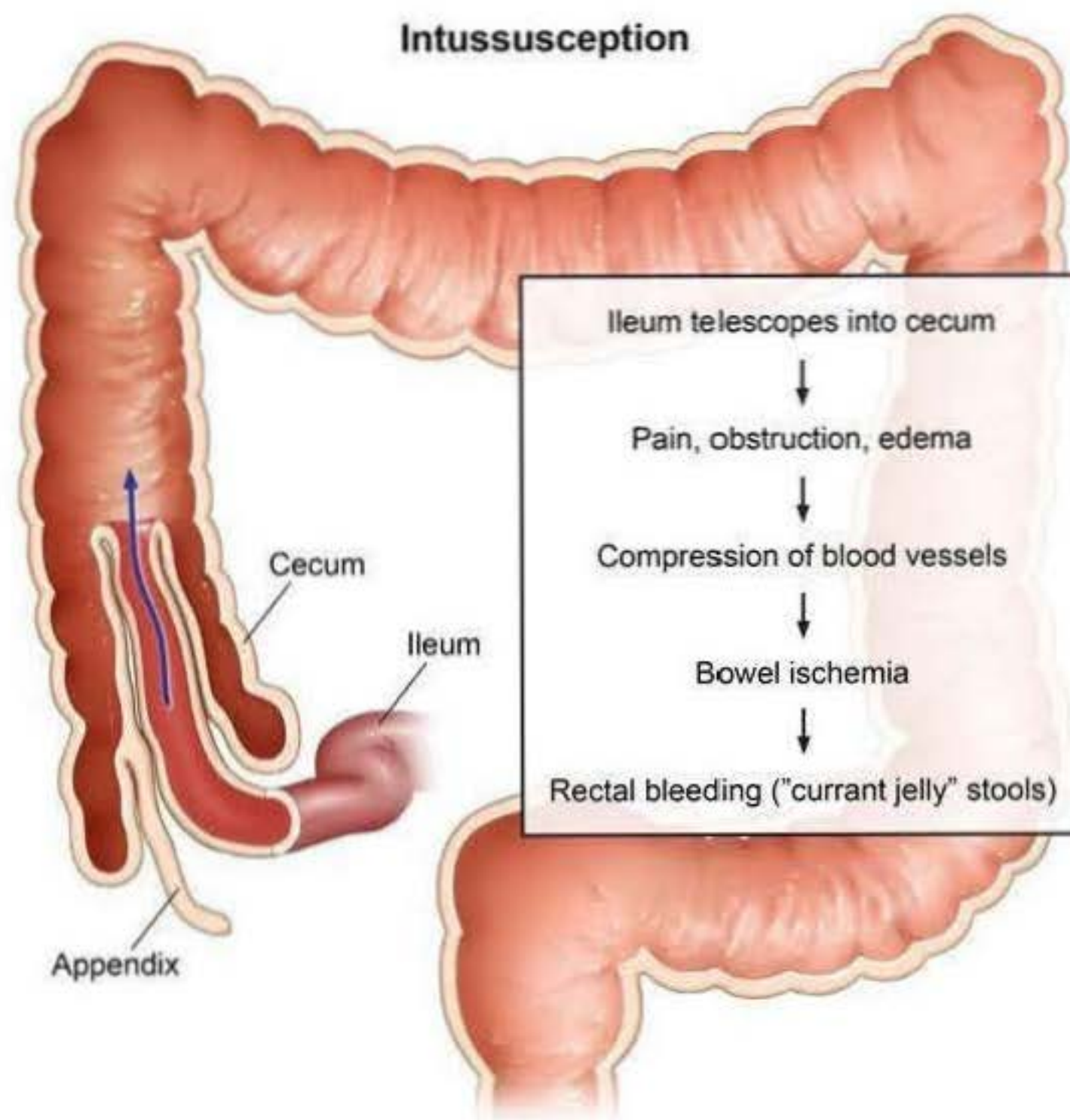
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- ☒ A. Air enema [76%]
- ☐ B. Computed tomography of the abdomen [6%]
- ☐ C. Exploratory laparotomy [6%]
- ☐ D. Observation [2%]
- ☐ E. Technetium-99m pertechnetate scan [10%]

Proceed to Next Item

Explanation:

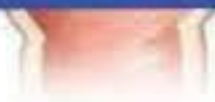
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This patient presents with intussusception, the telescoping of one bowel segment into another. Intussusception is the most common cause of intestinal obstruction in children age 6-36 months. The ileocolic junction is most frequently involved, with invagination of the ileum into the colon. Most children (~75%) have **no identifiable lead point**. Preceding viral infections (eg, gastroenteritis) are thought to play a role in inflaming intestinal lymphatic tissue (eg, Peyer patches), which can subsequently serve as a lead point for intussusception. Meckel's diverticulum, followed by polyps and hematomas (Henoch-Schönlein purpura), are the most commonly identified triggers in the remaining 25%.

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Classically, the telescoping is intermittent, resulting in **periodic pain** associated with drawing the legs up toward the abdomen. Emesis may follow episodes of abdominal pain. It is initially nonbilious but becomes bilious as the obstruction persists. Ongoing obstruction can compromise circulation causing mucosal ischemia, occult bleeding, and, if untreated, grossly bloody "**currant jelly**" stools. Occasionally, the intussusception is palpable as a tubular "sausage-shaped" mass in the right upper quadrant. Although the ileocecal junction is normally located in the right lower quadrant, the invagination of the ileum into the colon causes the obstructive mass to be found in the right upper quadrant.

Ultrasound is the method of choice in detecting intussusception and has a sensitivity and specificity of 100% if performed by an experienced sonographer during the period of pain. The positive finding of the "**target sign**" should prompt immediate enema reduction. Air or water-soluble contrast is instilled through the rectum and the pressure from these mediums successfully reduces most obstructions. **Air enemas** are preferred because they are typically faster, cleaner, and safer than contrast.

Observation (**Choice D**) is inappropriate because delayed reduction can lead to bowel necrosis that may require surgical resection. Laparotomy (**Choice C**) is indicated if enema reduction is ineffective, if a pathological lead point is identified, or if the patient presents with signs of perforation (eg, free air on x-ray, rigid abdomen).

(**Choice B**) Although computed tomography scan can identify intussusception, it cannot reduce the obstruction and would expose the patient to significant radiation. Computed tomography is indicated if the ultrasound is unrevealing or if there is concern for pathological lead points. It is unnecessary for most pediatric cases of intussusception.

(**Choice E**) Technetium-99m pertechnetate scan ("Meckel's scan") can detect gastric mucosa, which is present in approximately half of Meckel's diverticula. When intussusception has been identified, the priority is to reduce the obstruction. This scan can be considered later if there is ongoing unexplained bleeding.

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Educational objective:

Ultrasound is the first-line modality in diagnosing intussusception. A positive "target sign" should prompt reduction with air or water-soluble contrast enema.

References:

1. [Comparison of 2-view abdominal radiographs with ultrasound in children with suspected intussusception.](#)
2. [Intussusception in children: cost-effectiveness of ultrasound vs diagnostic contrast enema.](#)
3. [Intussusception in children--clinical presentation, diagnosis and management.](#)

Media Exhibit

ception

