

A 1-month-old full-term boy is brought to the office for evaluation of blood-streaked stools. He has been exclusively breastfed since birth and typically has 3-5 yellow-seedy stools daily that have become bloody over the past 24 hours. He nurses every 2-3 hours but regurgitates a large amount of breast milk with every feed. His mother recently completed a course of antibiotics for mastitis but otherwise has a regular diet and takes no medications. Weight, length, and head circumference have been tracking along the 40th percentile. Vital signs are normal. The infant appears well, and physical examination shows diffuse eczema. A fecal occult blood test is positive. Which of the following is the most likely cause of this patient's condition?

- ☐ A. *Clostridium difficile* colitis
- ☐ B. Intussusception
- ☐ C. Lactose intolerance
- ☐ D. Malrotation with midgut volvulus
- ☐ E. Meckel diverticulum
- ☐ F. Milk protein-induced enterocolitis

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- ☐

A. *Clostridium difficile* colitis [8%]
- ☐

B. Intussusception [8%]
- ☐

C. Lactose intolerance [7%]
- ☐

D. Malrotation with midgut volvulus [6%]
- ☐

E. Meckel diverticulum [13%]
- ☒

F. Milk protein-induced enterocolitis [57%]

Proceed to Next Item

Explanation:

User Id:

Milk- or soy-protein-induced colitis	
Risk factors	<ul style="list-style-type: none"><li>Family history of allergies, eczema, or asthma</li></ul>
Clinical features	<ul style="list-style-type: none"><li>Presents at age 2-8 weeks</li><li>Regurgitation or vomiting</li><li>+/-Painless bloody stools</li><li>+/-Eczema</li></ul>
Treatment	<ul style="list-style-type: none"><li>Elimination of milk &amp; soy from maternal diet of exclusively breastfed infants</li><li>Initiation of hydrolyzed formula in formula-fed infants</li></ul>



Proceed to Next Item

Explanation:

User Id: [REDACTED]

Milk- or soy-protein-induced colitis	
<b>Risk factors</b>	<ul style="list-style-type: none"> <li>Family history of allergies, eczema, or asthma</li> </ul>
<b>Clinical features</b>	<ul style="list-style-type: none"> <li>Presents at age 2-8 weeks</li> <li>Regurgitation or vomiting</li> <li>+/-Painless bloody stools</li> <li>+/-Eczema</li> </ul>
<b>Treatment</b>	<ul style="list-style-type: none"> <li>Elimination of milk &amp; soy from maternal diet of exclusively breastfed infants</li> <li>Initiation of hydrolyzed formula in formula-fed infants</li> </ul>
<b>Prognosis</b>	<ul style="list-style-type: none"> <li>Spontaneous resolution by age 1 year</li> </ul>

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Breast milk contains fats, carbohydrates (eg, lactose), and maternal diet-derived proteins (eg, whey, casein) from milk and soy. This patient has **milk- or soy-protein-induced proctocolitis** (eg, milk-protein allergy), a condition exclusive to infants. A non-IgE-mediated immunologic response to proteins in formula or breast milk causes rectal and colonic inflammation. The clinical presentation includes eczema, regurgitation or vomiting, and/or **painless bloody stools**.

The diagnosis is clinical and confirmed when bleeding ceases in response to dietary modifications. Due to substantial cross-reactivity, both dairy and soy should be avoided. Therefore, the mother of a breastfed infant can continue to breastfeed after **eliminating all dairy and soy** from her diet. Formula-fed infants should be switched to a **hydrolyzed formula** (ie, containing predigested proteins). Visible bleeding should resolve within 3 days, but complete resolution of occult blood may take up to 2 weeks. Parents should be reassured that the prognosis is excellent and that almost all affected infants can tolerate dairy and soy products by age 1 year.

(Choice A) Although antibiotics, a risk factor for *Clostridium difficile* colitis, may be



Therefore, the mother of a breastfed infant can continue to breastfeed after eliminating all dairy and soy from her diet. Formula-fed infants should be switched to a hydrolyzed formula (ie, containing predigested proteins). Visible bleeding should resolve within 3 days, but complete resolution of occult blood may take up to 2 weeks. Parents should be reassured that the prognosis is excellent and that almost all affected infants can tolerate dairy and soy products by age 1 year.

(Choice A) Although antibiotics, a risk factor for *Clostridium difficile* colitis, may be transmitted through breast milk, symptomatic disease (eg, diarrhea +/- blood, fever) is rare in infants due to lack of intestinal receptors to the offending toxin until approximately age 2 years.

(Choice B) **Intussusception** classically occurs in children age 6-24 months and presents with lethargy, vomiting, and episodic, crampy pain as one bowel segment telescopes into another. Hematochezia is considered a late sign and is indicative of bowel ischemia. This infant has no pain or fussiness.

(Choice C) Lactose intolerance is a nonimmunologic reaction to the carbohydrate component of cow's milk due to deficiency of the intestinal brush border enzyme lactase. Symptoms include crampy abdominal pain, bloating, flatulence, and nonbloody diarrhea. Lactose intolerance rarely occurs in infancy.

(Choice D) Malrotation with midgut **volvulus** can cause bloody stools due to intestinal ischemia; however, neonates are also ill-appearing with bilious emesis and poor appetite.

(Choice E) Painless hematochezia can be a manifestation of **Meckel diverticulum**, an embryologic remnant that may contain ectopic gastric or pancreatic tissue. This condition is far less common than milk-protein-induced colitis, especially in infants with diffuse eczema and regurgitation.

#### Educational objective:

Milk- or soy-protein proctocolitis should be suspected when a well-appearing neonate has painless bloody stools. Rectal bleeding should stop within 2 weeks of eliminating maternal dairy and soy products or switching to a hydrolyzed formula.

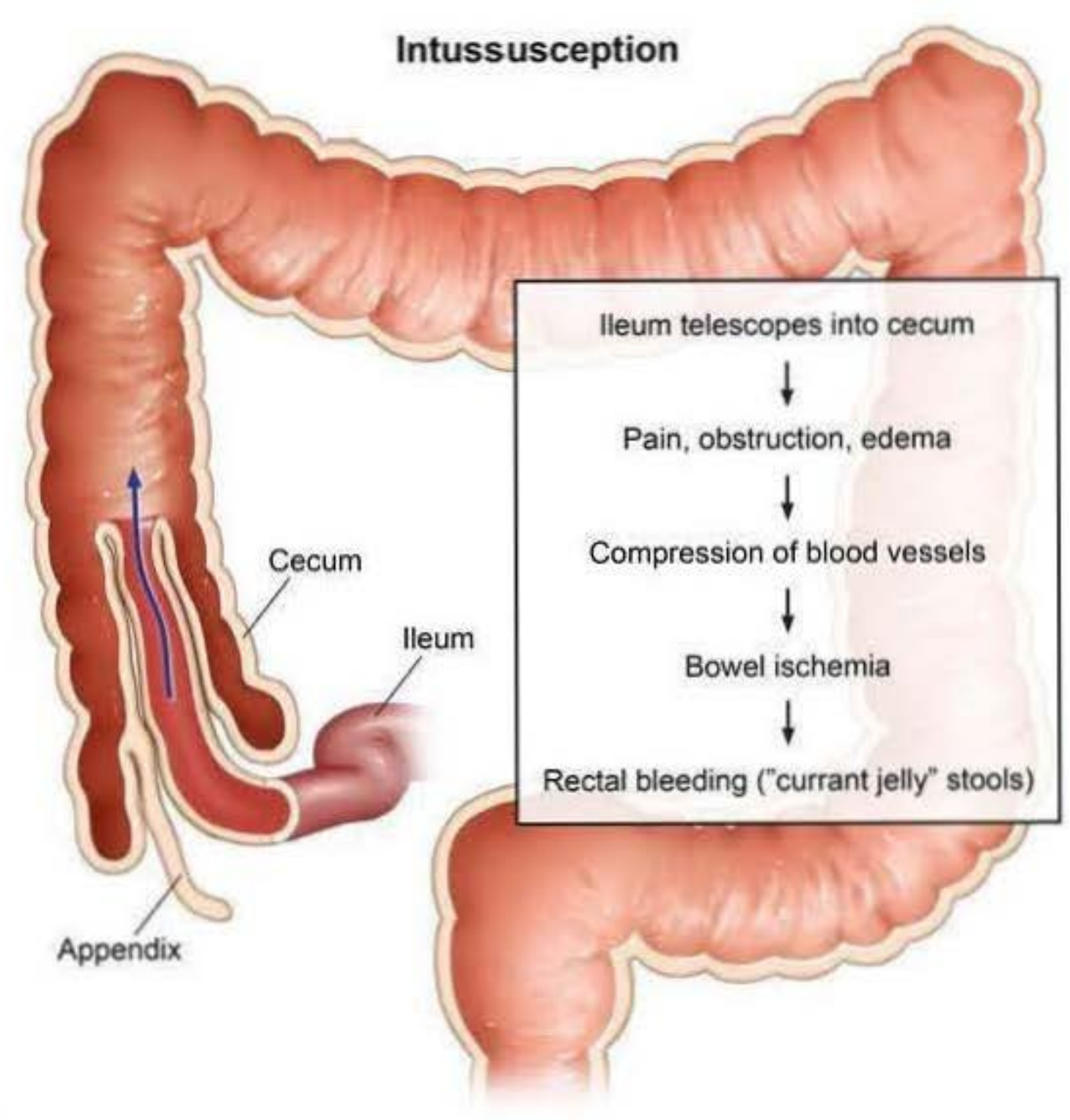
#### References:

1. **Rectal bleeding in infancy: clinical, allergological, and microbiological examination.**
2. **Treatment of cow's milk protein allergy.**
3. **Cow's milk allergy versus cow milk intolerance.**



Media Exhibit

intestinal obstructions



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Media Exhibit

intestinal obstructions

Volvulus



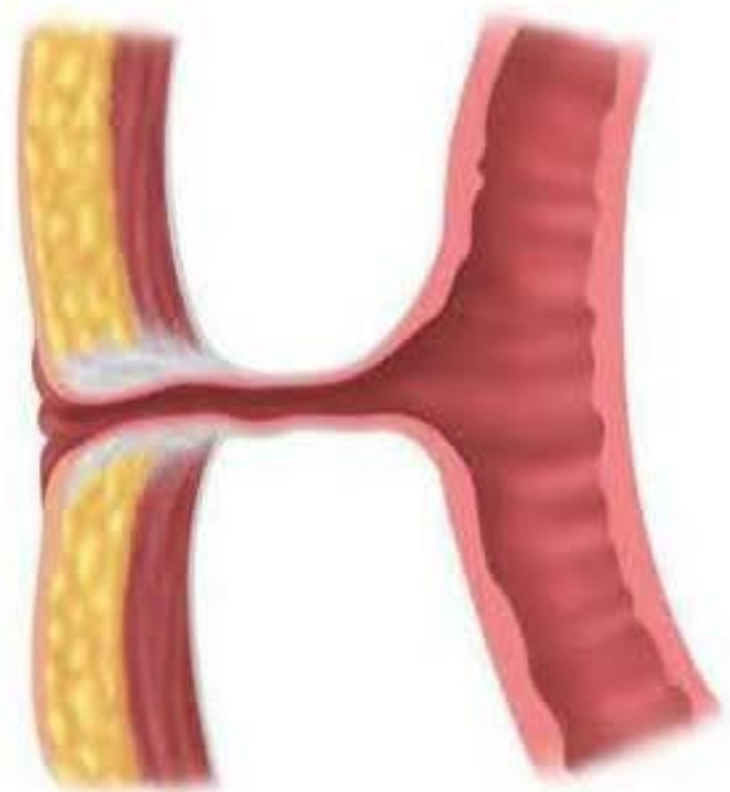
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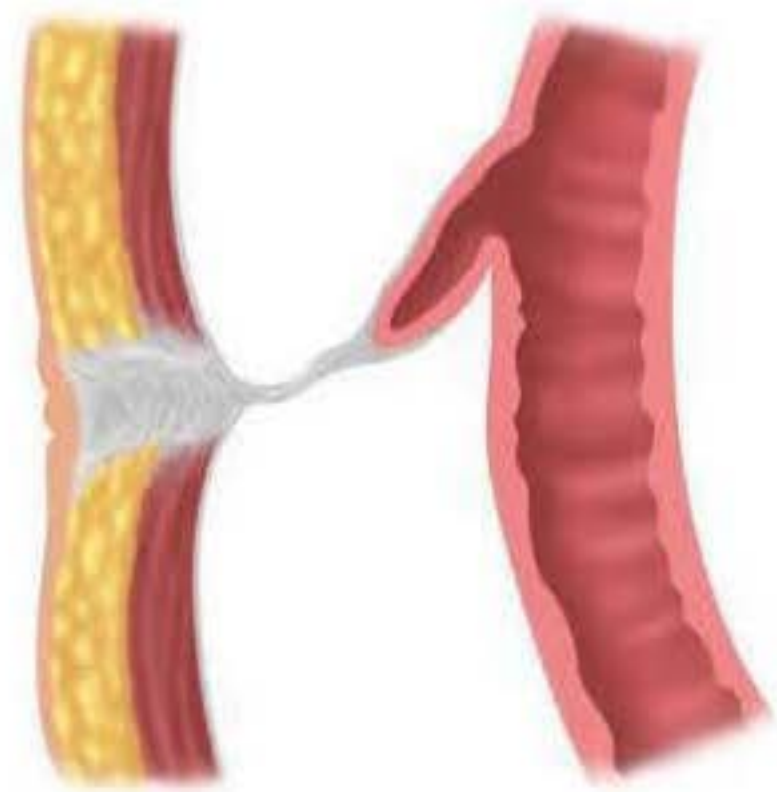
Media Exhibit

duct abnormalities

Vitelline duct abnormalities



Persistent vitelline duct



Meckel diverticulum

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