AMSER Case of the Month August 2022

17-month-old with vomiting and abdominal pain

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AMSER

Patient Presentation

- HPI: 17-month-old male presents to the ED with complaints of persistent vomiting and abdominal pain for 1 day. The patient was evaluated at another ED earlier in the day and was told he had a viral illness. He was discharged with Zofran for symptom control. Since discharge he vomited two more times, once with orange-tinged stomach contents, prompting return to the ED. The parents deny any hematochezia, hematemesis, or history of trauma. No sick contacts. He has a distant history of RSV bronchiolitis and recent bilateral myringotomy tube placement for recurrent ear infections.

- Immunizations are up to date

- Physical exam
  - Afebrile and hemodynamically stable, tachycardic at 141 bpm
  - Fatigued and fussy on exam but otherwise well-developed, well-nourished
  - Abdomen: bowel sounds slightly decreased, soft nondistended without tenderness or masses, no guarding or rebound tenderness

Pertinent Labs

- CBC within normal limits
- CRP elevated at 1.6
- Gastroccult **positive** emesis

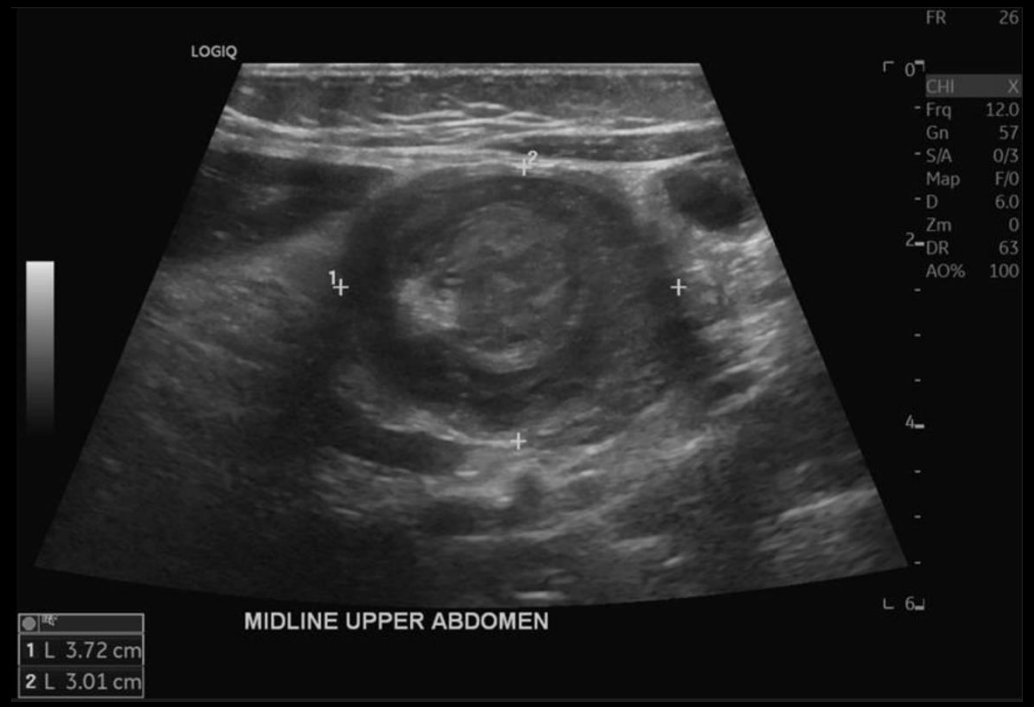
What imaging should we order?

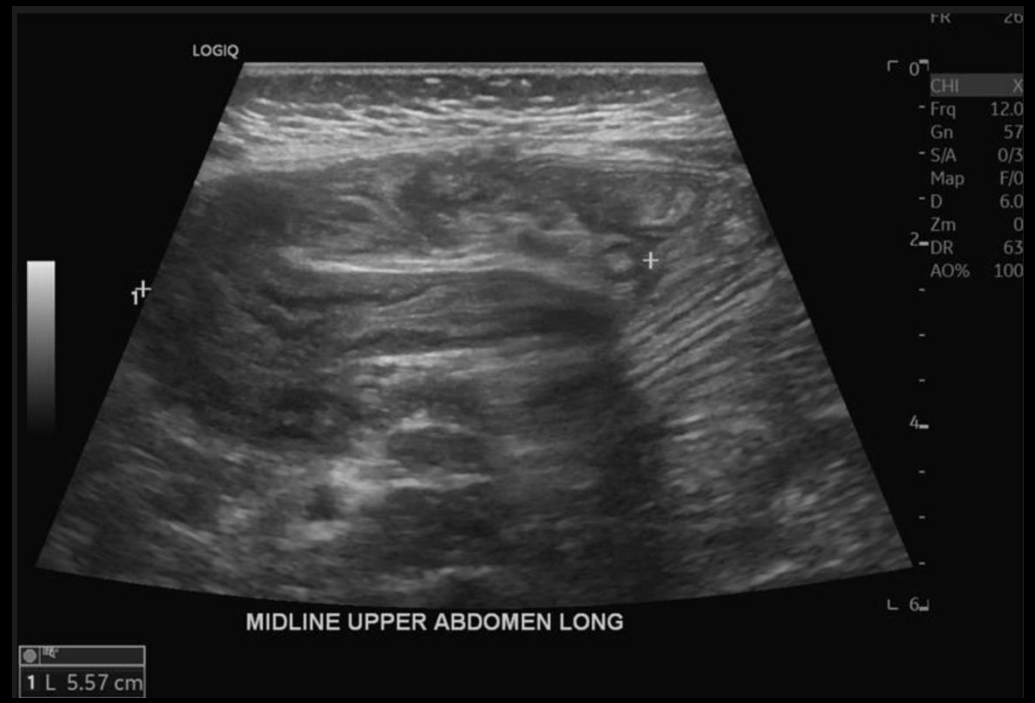
Select the applicable ACR Appropriateness Criteria

Scenario	Procedure	Adult RRL	Peds RRL	Appropriateness Category	
Vomiting, bilious, normal bowel gas pattern on xray, next imaging study	Fluoroscopy upper GI series	1-10 mSv ☢☢☢	0.3-3 mSv [ped] ☢☢☢	Usually appropriate	
	US abdomen (UGI tract)	0 mSv O	0 mSv [ped] O	May be appropriate	
	Fluoroscopy contrast enema	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate	
	Nuclear medicine gastroesophageal reflux scan	TBD TBD	0.3-3 mSv [ped] ☢☢☢	Usually not appropriate	

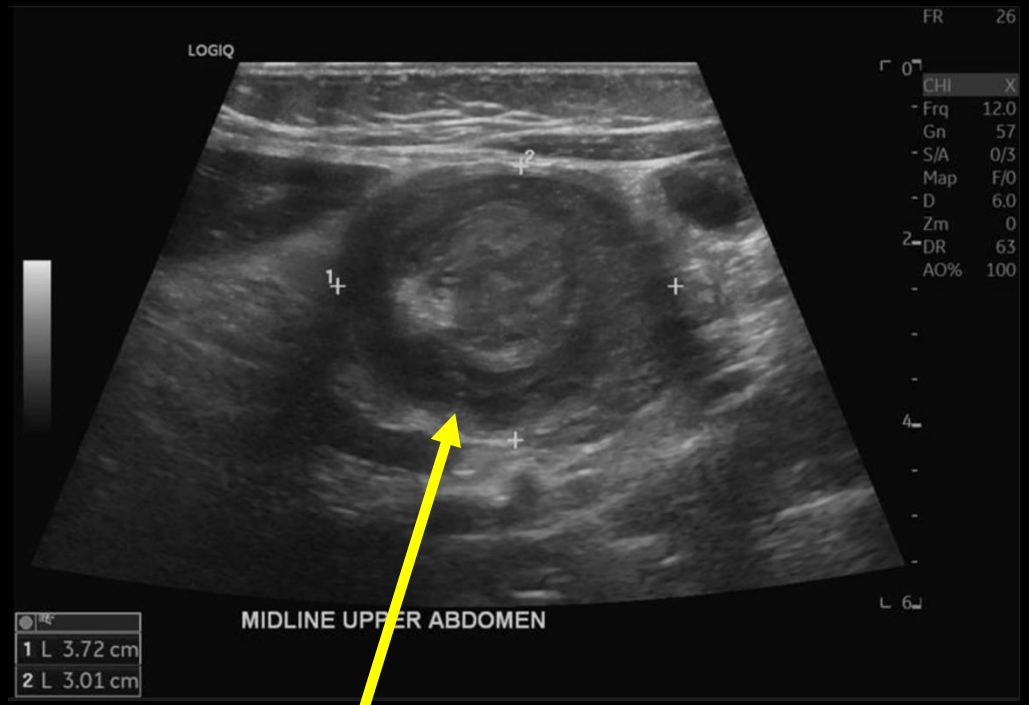
This imaging modality was ordered by the ED physician

Ultrasound (unlabeled)



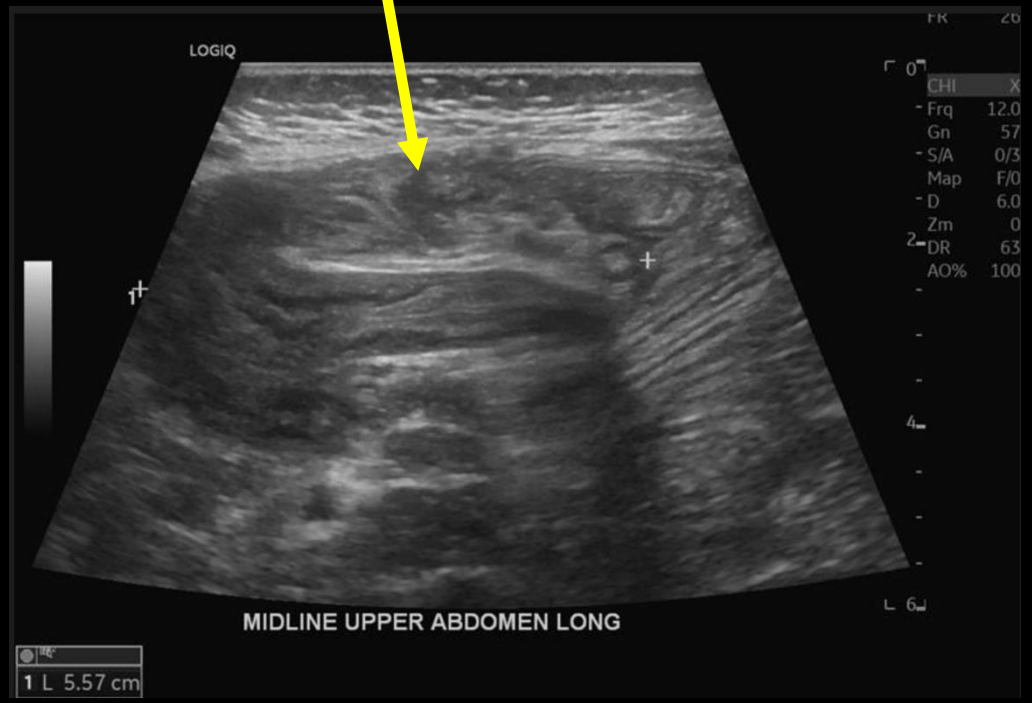


Ultrasound: (labeled)



Target sign: alternating echogenic and hypoechoic bands on transverse view

Pseudokidney sign: fat containing mesentery is dragged into the intussusception on longitudinal view, mimicking the renal hilum



Patient transferred to pediatric ED from critical access hospital (Unlabeled)

- Follow up abdominal xray done to check for signs of obstruction or perforation

Patient transferred to pediatric ED from critical access hospital (Labeled)

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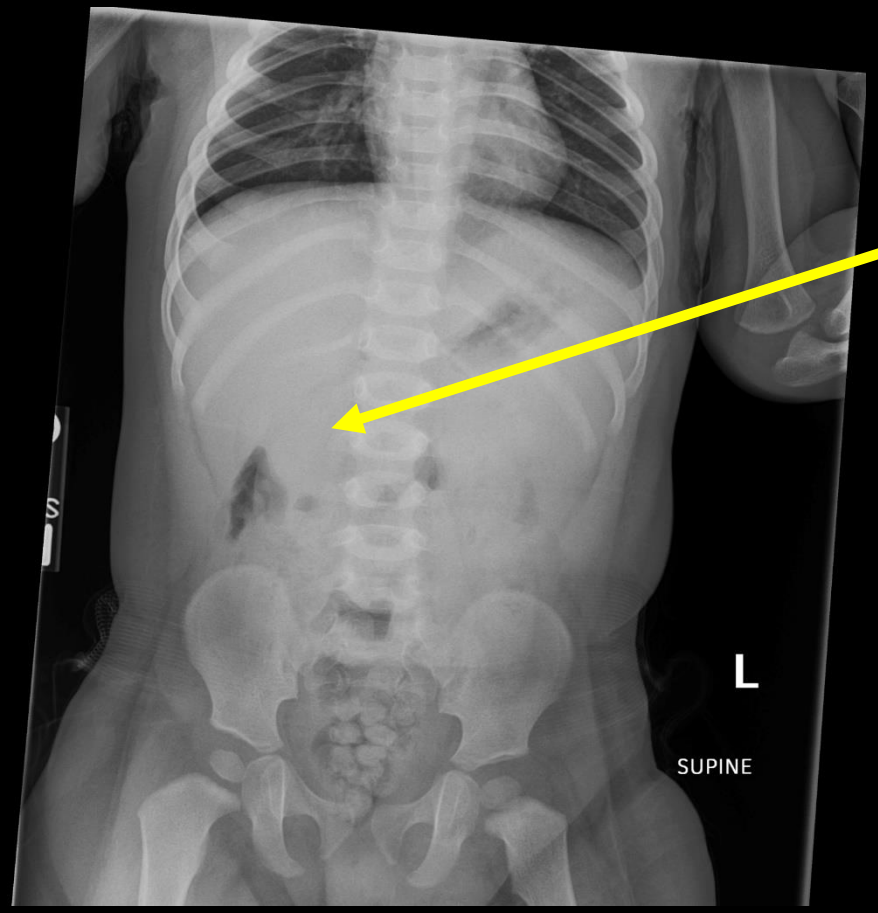
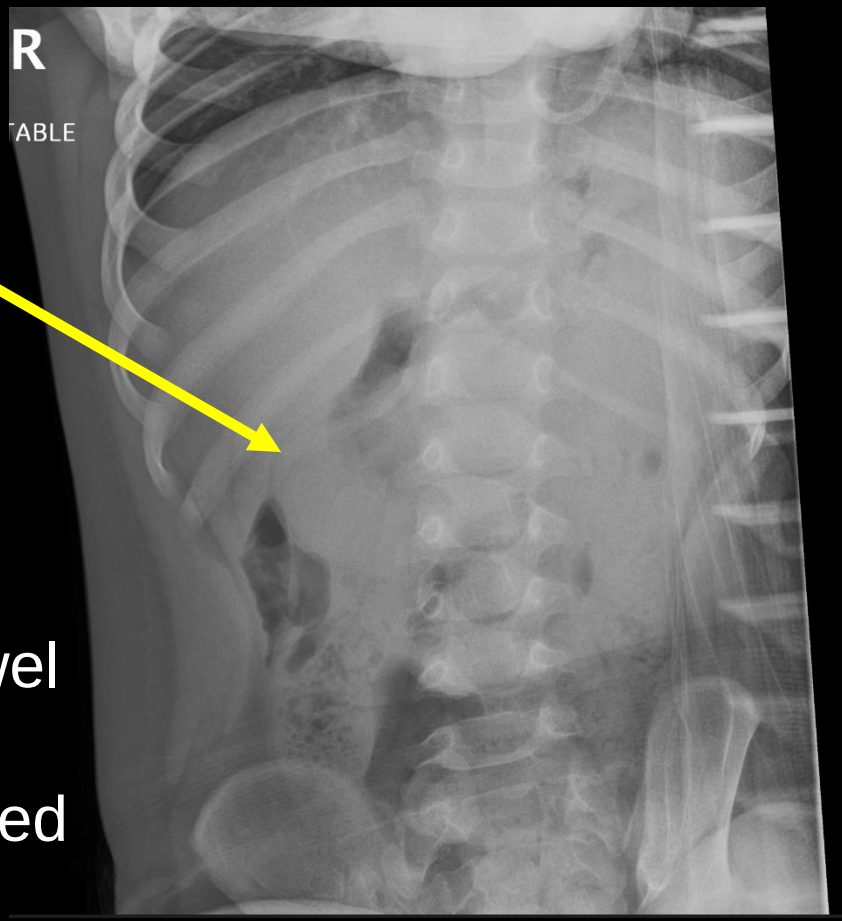


RUQ mass

No intraperitoneal free air

No signs of small bowel obstruction (air fluid levels or dilated loops of bowel)



Final Diagnosis:

Ileocolic Intussusception

Case Discussion

- Intussusception is the process in which a portion of the intestine telescopes into itself, most commonly an ileocolic intussusception
- Most common cause of GI obstruction in children, usually in children ages 6-18 months
- Approximately 90% of cases are idiopathic, assumed to be secondary to uncoordinated peristalsis or lymphoid hyperplasia from viral gastroenteritis
- 5-6% are due to pathologic lead points, such as Meckel diverticulum, cysts, polyps, or lymphoma
- Classic triad of symptoms include acute colicky abdominal pain, “currant jelly” or frank bloody stools, and a palpable abdominal mass with vomiting

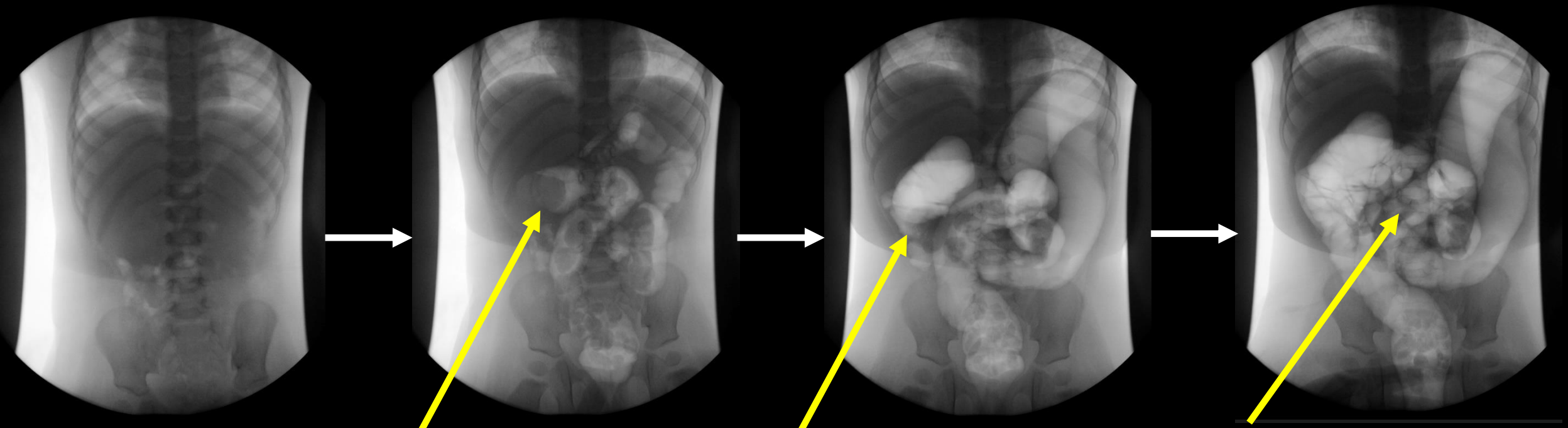
Diagnosis

- Diagnosis is crucial to avoid potentially lethal complications such as bowel obstruction and ischemia/necrosis with potential perforation
- **Ultrasound** is the first examination utilized for diagnosis, especially when patients present with at least 2 of the 3 cardinal symptoms. In this case, suspicion of intussusception as the likely diagnosis (rather than midgut volvulus based on the lack of bilious emesis) prompted ordering an ultrasound instead of an Upper GI Series.
  - Sensitivity of 97.9% and specificity of 97.8%, near-zero false negative rate (0.3%) for ultrasound diagnosis of intussusception
  - Look for the characteristic “target sign”
- **Radiographs** of the abdomen may demonstrate a soft tissue mass, often in the right upper quadrant. Small bowel obstruction is sometimes seen in the setting of intussusception. However, most commonly, the abdominal radiographs are unremarkable. The main purpose in obtaining abdominal radiographs is to assess for pneumoperitoneum.

Treatment

- Ileocolic intussusception can be treated with air or hydrostatic enema reduction under fluoroscopic guidance
  - Catheter is inserted into the rectum and air or contrast material is instilled into the colon
- Our patient received an air enema under fluoroscopic guidance (next slide)
  - “The intussusception was encountered at the hepatic flexure, more air was insufflated, and the intussusception reduced back to the ileocecal valve over a period of 2-3 minutes"
  - The goal is to keep the air pressure at 60-100 mmHg, never passing 120 mmHg
- Main complication is perforation
  - Since surgical intervention is the only other option, the enema reduction is traditionally attempted first
- Approximately 10-15% recurrence rate after successful air/hydrostatic enema reduction, typically in the first 24-48 hours

Air Enema Under Fluoroscopic Guidance



Air introduced into colon: curved air contrast delineates leading edge of the intussuscepted bowel (intussusceptum in the RUQ

Intussuscepted bowel begins to reduce towards the terminal ileum as more air is introduced

Disappearance of the intussusceptum and air visualized in the small bowel indicates full reduction of the intussuscepted bowel

References:

1. ACR Appropriateness Criteria https://acsearch.acr.org/list
2. Bartocci, M., Fabrizi, G., Valente, I., Manzoni, C., Speca, S., Bonomo, L. (2014). Intussusception in childhood: role of sonography on diagnosis and treatment. *Journal of ultrasound*, *18*(3), 205–211. https://doi.org/10.1007/s40477-014-0110-9
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4. Radiopedia https://radiopedia.org/articles/intussusception