

Pediatric Radiology Case:

22 month old male with intussusception

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1/5/2020

Diagnostic Radiology: RAD 4001

Dr. Wang, PGY-2

Clinical History

- 22 month old male reports to the ED with intermittent abdominal pain for two days
- Painful episodes occur every 30 minutes followed by periods of calmness
- Denied fever, chills, dyspnea, fatigue, and diarrhea. Endorsed non-bloody emesis (x1) and constipation
- PMHx, PSHx, FHx, and SHx are negative
- No Medications, NKDA, Immunizations UTD

Clinical History Cont'd

- Pertinent Physical Exam
 - Vitals wnl
 - ABD: soft, non-tender, no guarding, no rebound, no masses or abdominal distension
- Clinical Differential Diagnosis
 - Constipation
 - Intussusception
 - Mesenteric Adenitis
- Initial Workup
 - RLQ Ultrasound
 - Abdominal X-ray

ACR appropriateness Criteria

- Child. Appendicitis rule out.
 - The US Abdomen was **appropriate**

Variant 2: Child. Suspected acute appendicitis, intermediate clinical risk. Initial imaging.		
Procedure	Appropriateness Category	Relative Radiation Level
US abdomen RLQ	Usually Appropriate	0
US abdomen	Usually Appropriate	0
CT abdomen and pelvis with IV contrast	May Be Appropriate (Disagreement)	⊗⊗⊗⊗
CT abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	⊗⊗⊗⊗
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate (Disagreement)	0
MRI abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	0
Radiography abdomen	May Be Appropriate (Disagreement)	⊗⊗
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	⊗⊗⊗⊗⊗
US pelvis	Usually Not Appropriate	0

Variant 2:**Child. Suspected acute appendicitis, intermediate clinical risk. Initial imaging.**

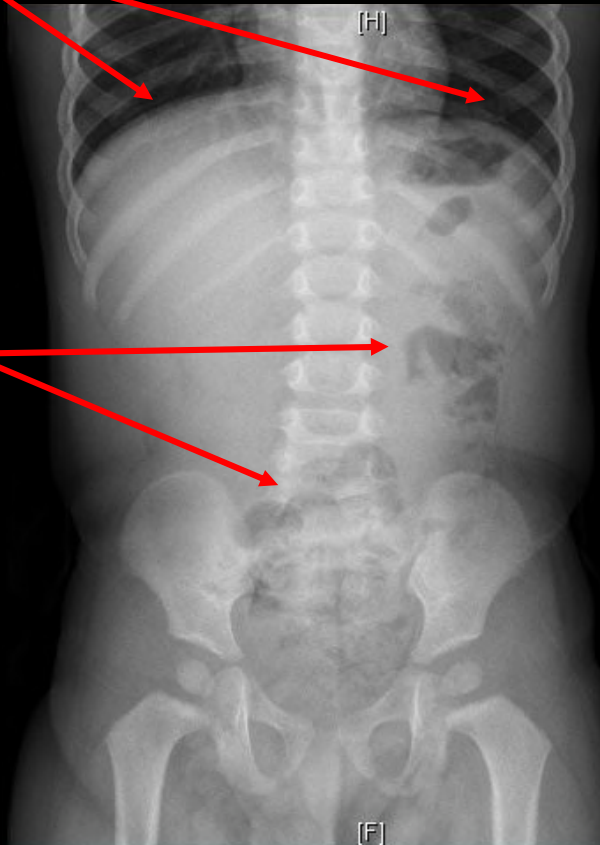
Procedure	Appropriateness Category	Relative Radiation Level
US abdomen RLQ	Usually Appropriate	○
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US pelvis	Usually Not Appropriate	○

- In patients of high suspicion, plain radiographs should not be used to exclude intussusception
- Sensitivity for abdominal radiographs to diagnose intussusception ~ 48% and the specificity ~ 21%
- In one study, > 20% of patients with intussusception had negative plain films
- May be able to show signs of bowel obstruction or gross perforation

Abdominal X-ray (1/13/2020)

Lung bases and diaphragm

Upright



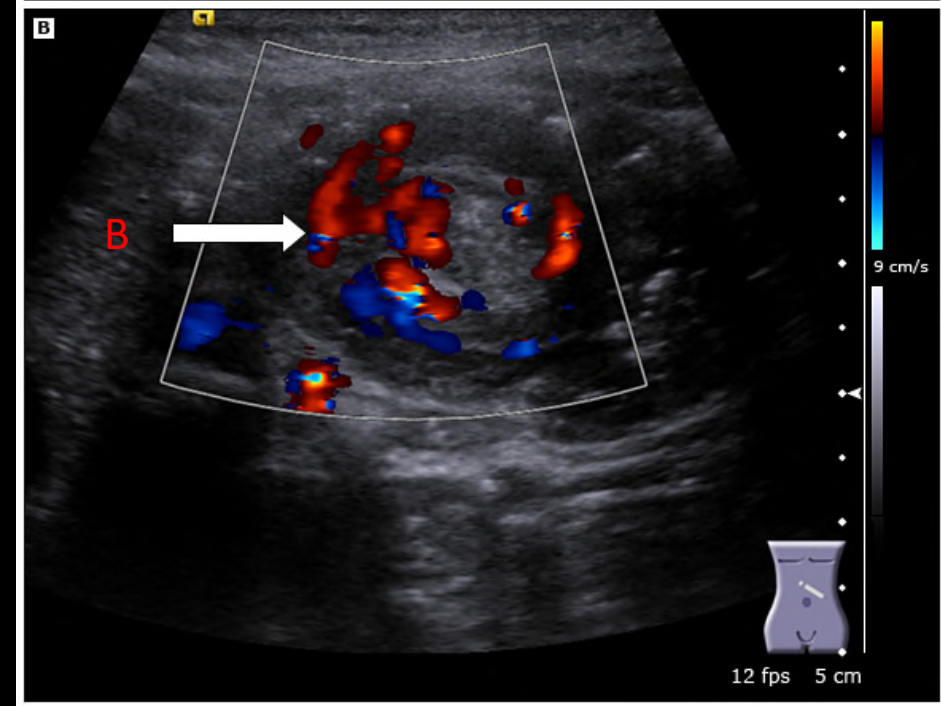
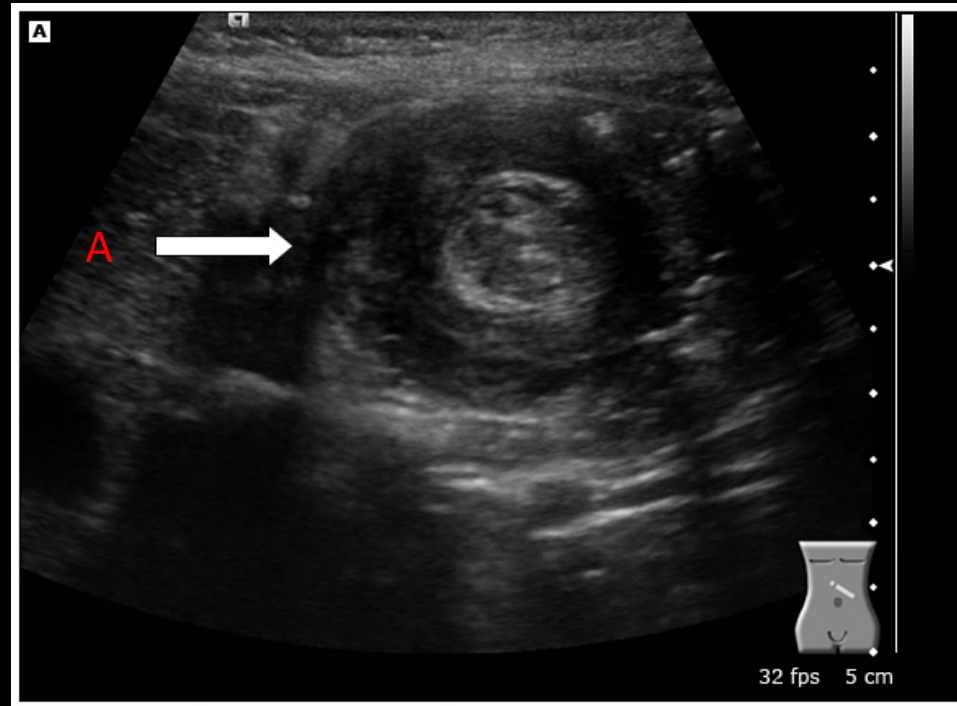
Supine



Moderate stool burden in descending colon, recto-sigmoid colon, and rectum

- Lung bases are clear
- Non-obstructive bowel gas pattern
- No evidence of pneumatosis, abnormal calcifications, organomegaly, or abdominal masses
- Moderate stool burden within distal colon and rectum

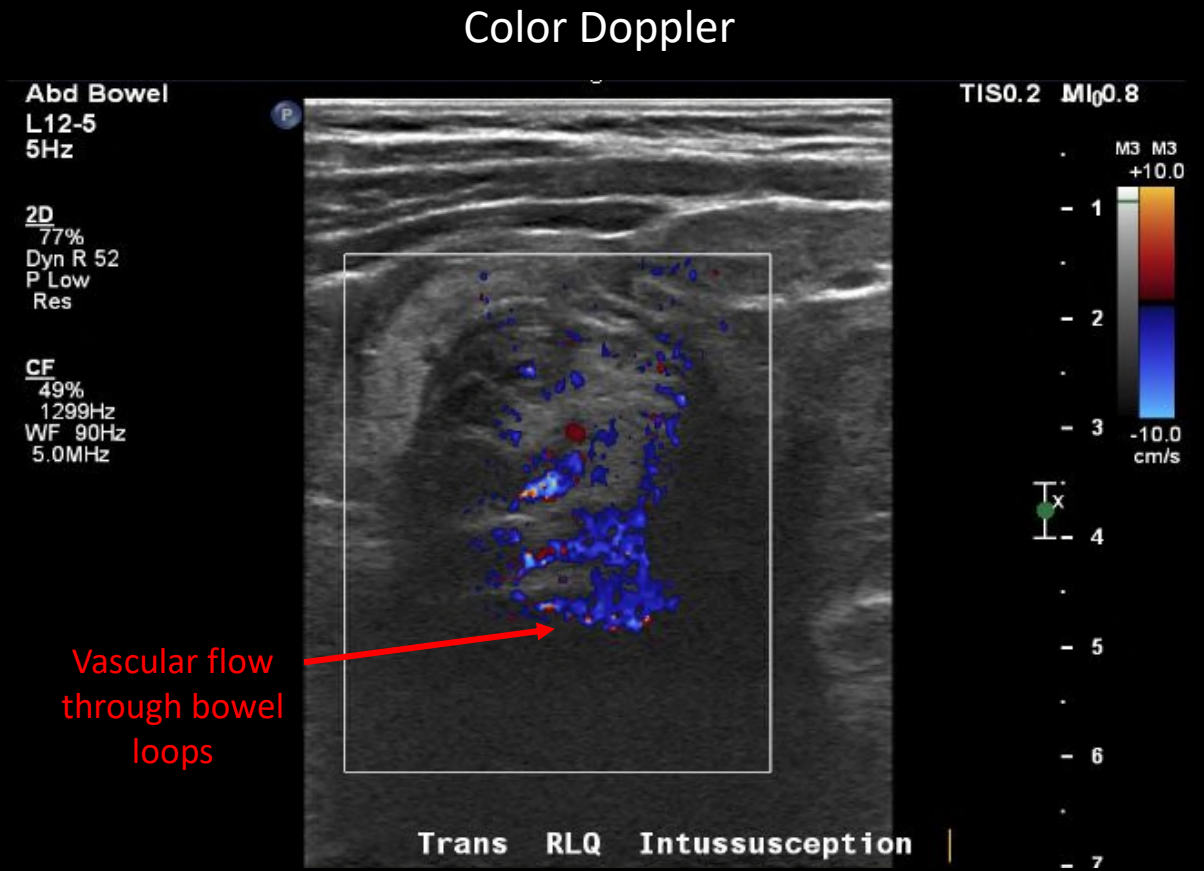
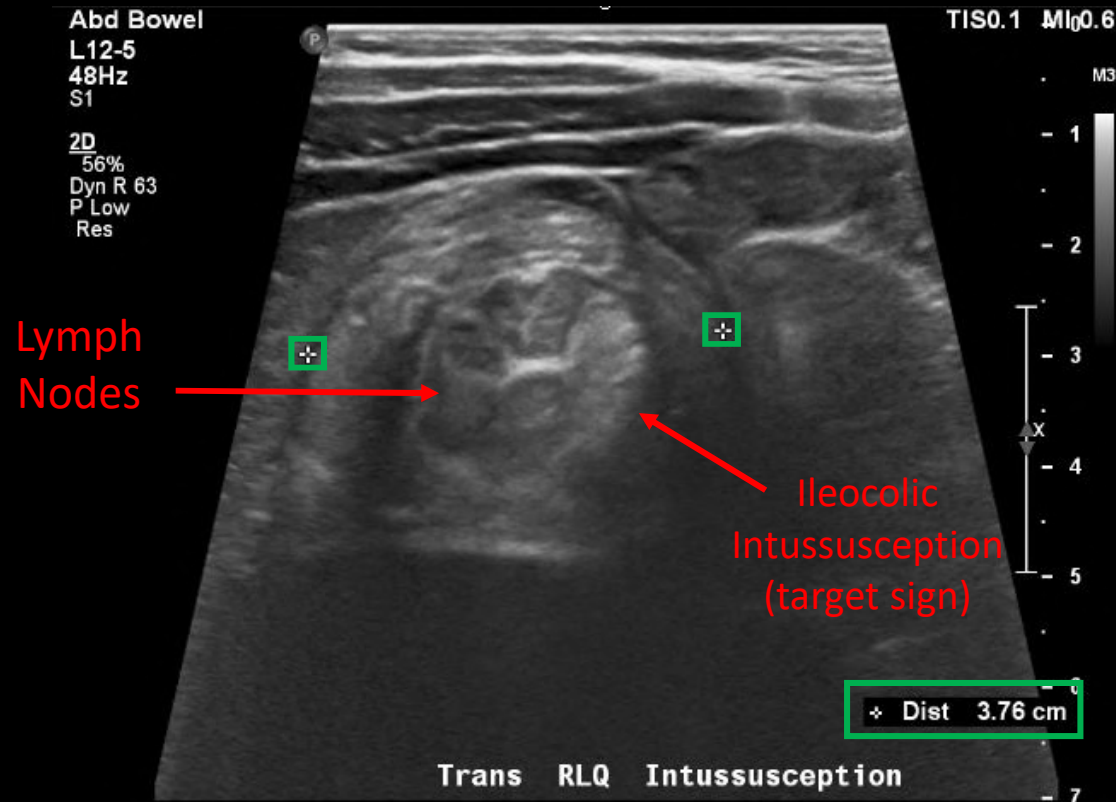
Typical Intussusception Imaging



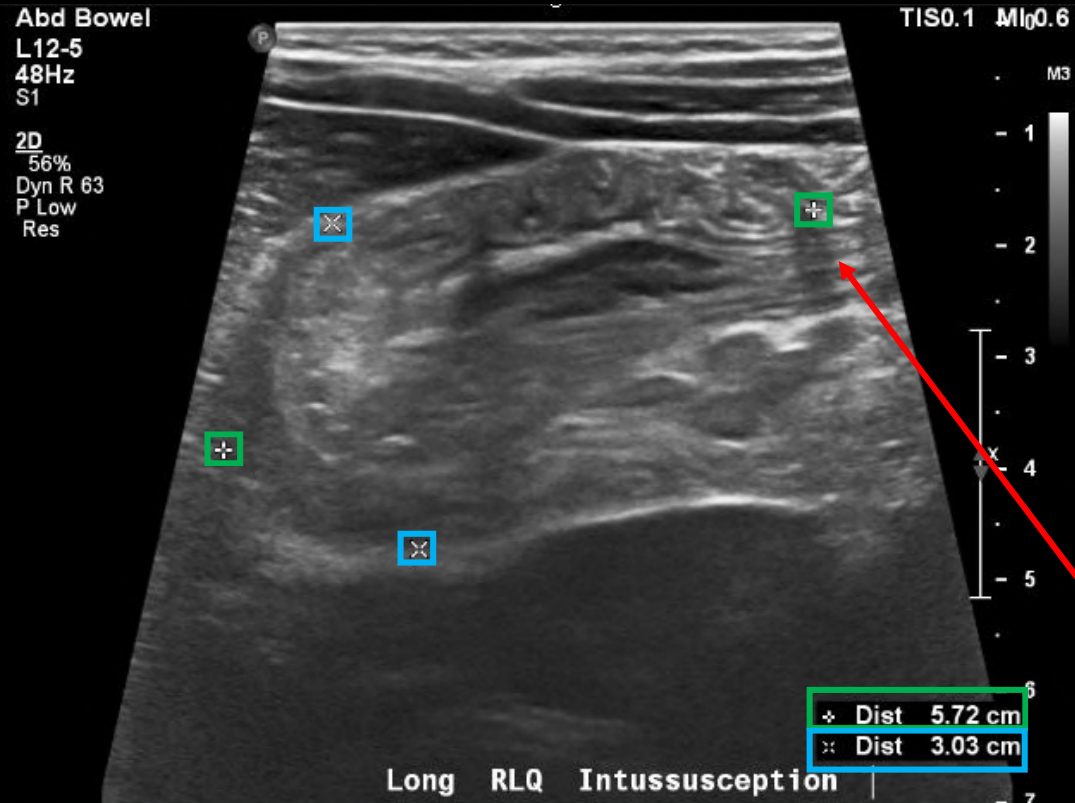
A → Classic "bullseye" mass lesions in the mid-upper abdomen where the transverse colon is typically located

B → Color Doppler demonstrates persistent flow within the ileocolic bowel involved with the intussusception

RLQ Abdominal Ultrasound (1/13/2020) – Transverse View

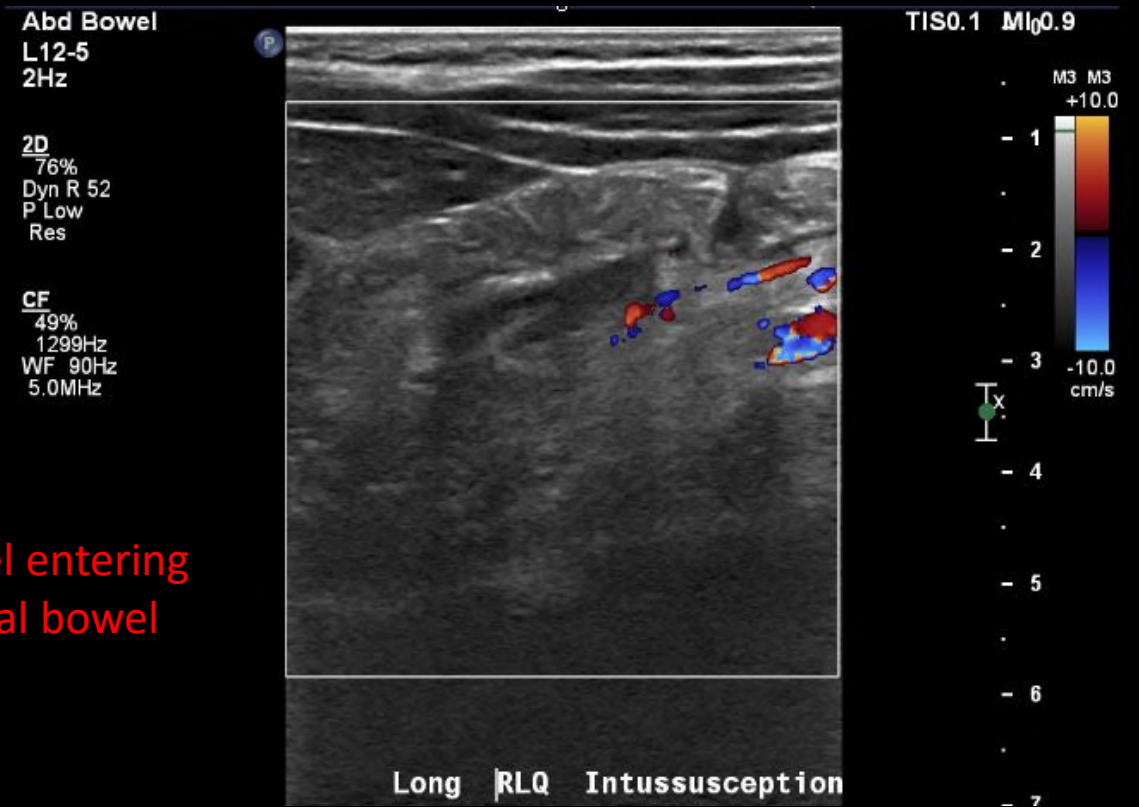


RLQ Abdominal Ultrasound (1/13/2020) – Longitudinal View



Bowel entering distal bowel

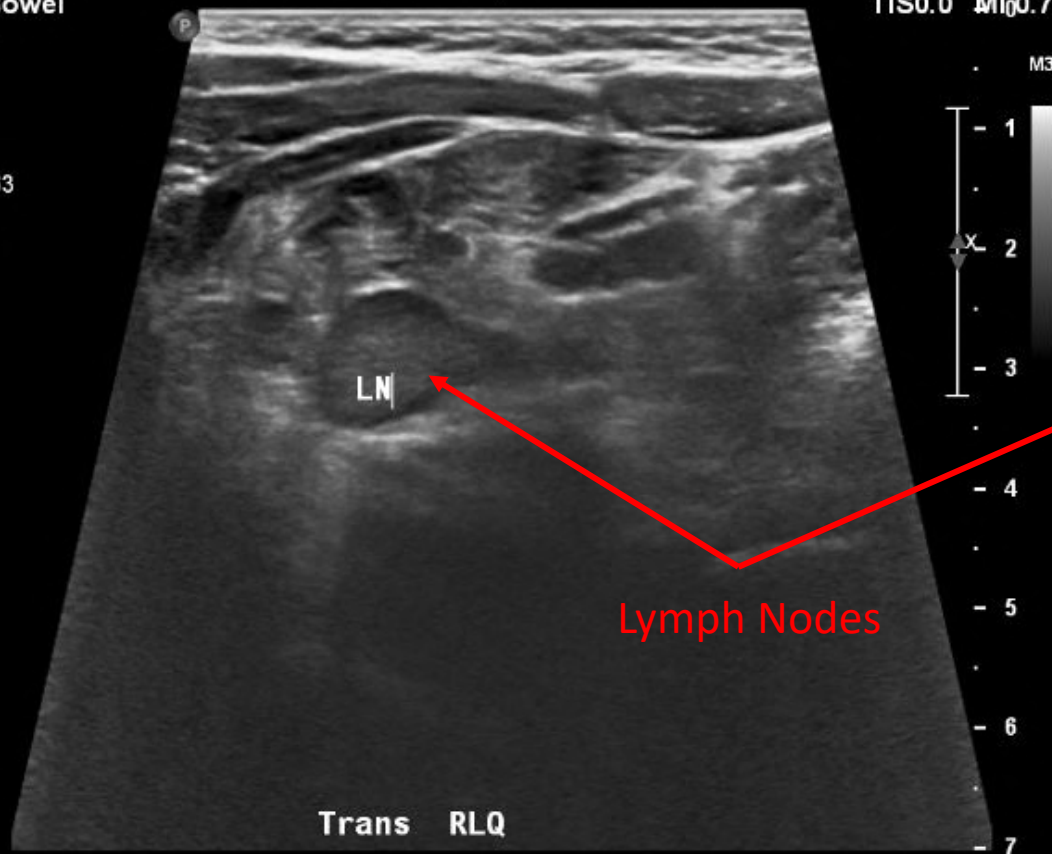
Color Doppler



RLQ Abdominal Ultrasound (1/13/2020)

Abd Bowel
L12-5
48Hz
S1

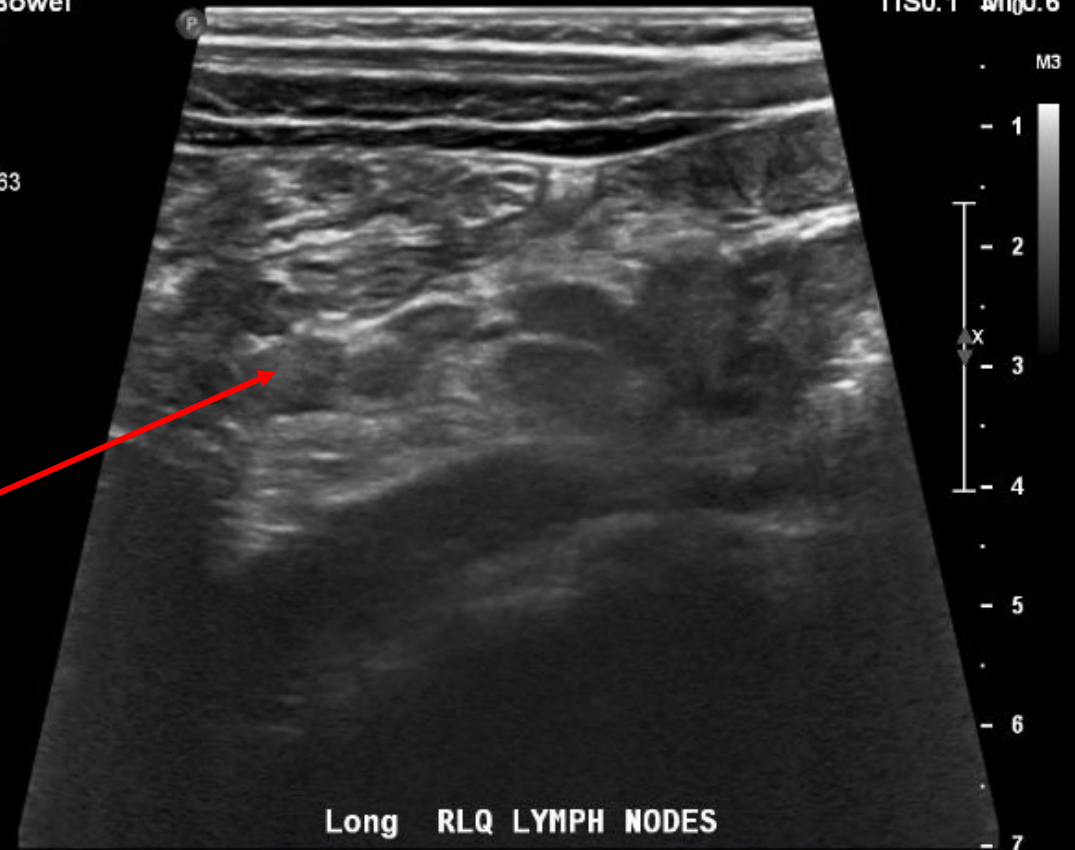
2D
56%
Dyn R 63
P Low
Res



Lymph Nodes

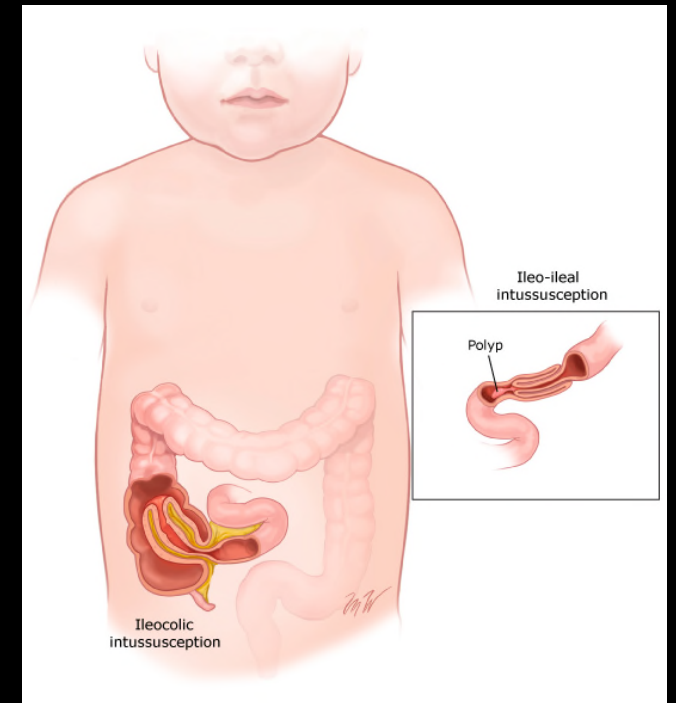
Abd Bowel
L12-5
48Hz
S1

2D
53%
Dyn R 63
P Low
Res



Intussusception

- The telescoping of one part of the intestine into a more distal segment
- Most common abdominal emergency in children under the age of 2
- Pathologic lead point in < 25% of cases, mostly idiopathic
- 90% of all cases occur at the ileocecal junction
- Lead points may include a Meckel diverticulum, polyp, duplication cyst, tumor, hematoma, or a vascular malformation



Treatment

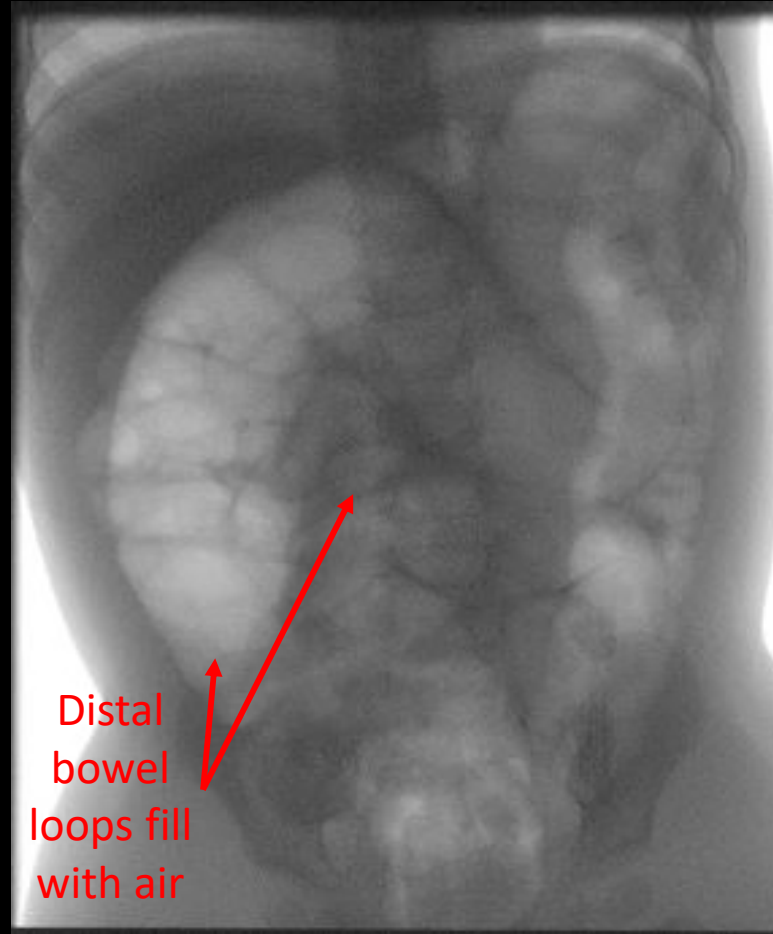
- Indications for surgical intervention
 - Unstable patient
 - Peritonitis or intestinal perforation
 - Non-operative reduction is *completely* unsuccessful
- This patient received non-operative reduction through fluoroscopy-guided pneumatic enema
 - 80-90% success rate of reduction
- Pediatric surgery should be consulted before non-operative reduction in case of procedural perforation or completely unsuccessful reduction

Fluoroscopy-Guided Air Enema (1/13/2020)

Filling defect at ileocolic junction



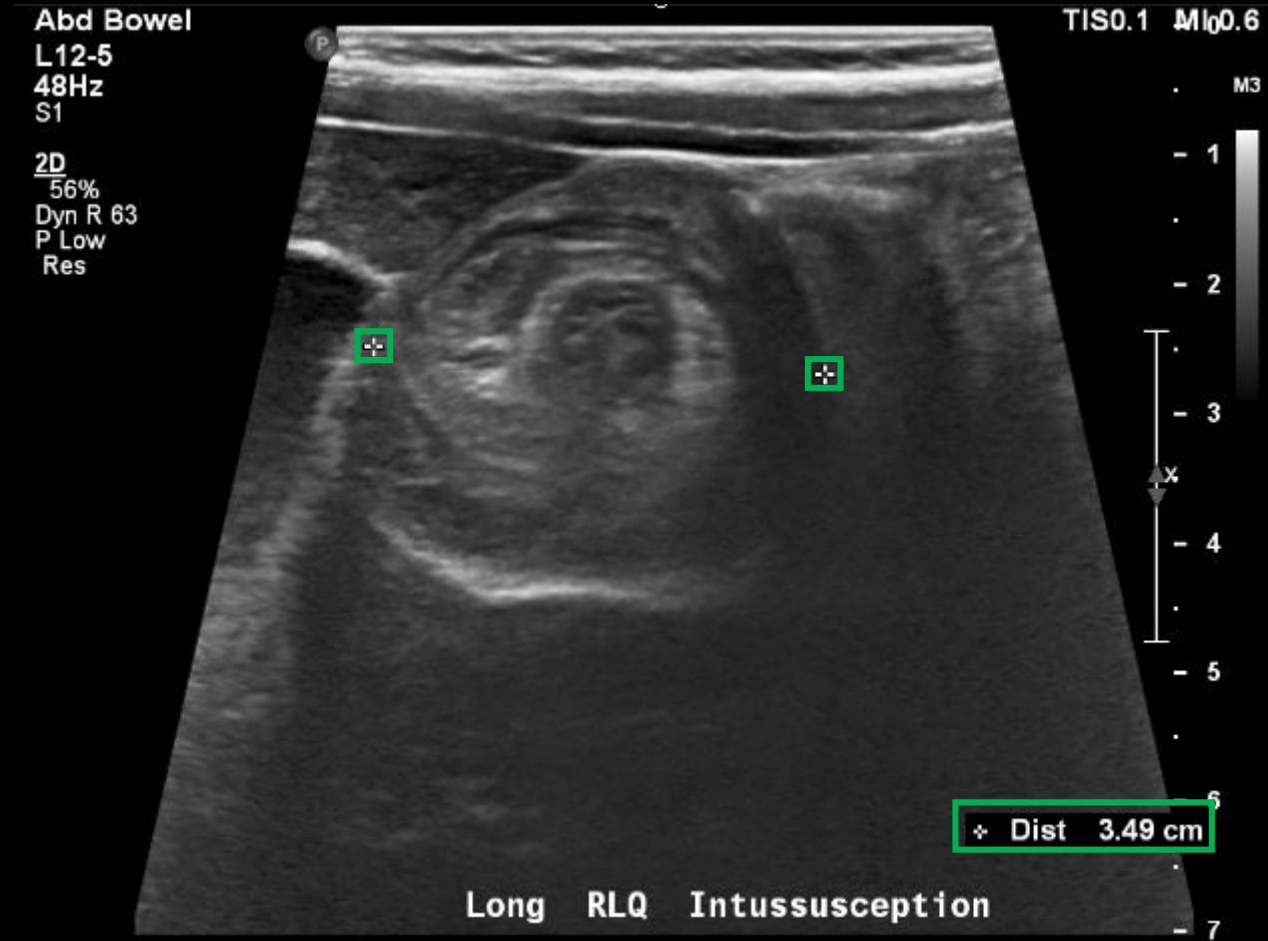
Distal bowel loops fill with air



- Air filling defect in RLQ, reduced after 3 attempts via pneumatic enema
- Intussusception reduced, filling small bowel loops with air

Discussion

- Successfully reduced ileocecal intussusception does not require any further imaging
- Intussusception recurs in ~ 10% of children. Approximately 50% of the recurrences are within the first 72 hours of reduction → Why?
- Delayed repeat enema → If the non-operative reduction is partly successful and patient is still stable
 - Avoid if first attempt was completely unsuccessful or in unstable patients → operative reduction



FINDINGS: Bowel within bowel appearance is noted within the right lower quadrant. This measures approximately 3.5 cm in diameter. Several small lymph nodes are seen in the right lower quadrant. No abnormal free fluid is identified.

IMPRESSION: Sonographic findings consistent with an ileocolic intussusception at the right lower quadrant.

Charge Master at Memorial Hermann:

- Ultrasound Abdomen Complete (x2)
 - \$1,841.50
- Abdomen X-ray 2-views (x1)
 - \$651
- Colon Barium Enema w/ Air Contrast (x2)
 - \$1,670

Total: \$7,674.00

Case Summary

- 22 month old male with intermittent abdominal pain for 2 days followed by periods of calmness
- RLQ ultrasound showed ileocecal intussusception
- Same day fluoroscopy-guided air enema was used to successfully reduce the intussusception
- Patient returned the next day with similar symptoms
- RLQ ultrasound showed a recurrent, but smaller, ileocecal intussusception
- Delayed repeat enema was successful

Take Home Points

- For a patient under 2 years of age and highly suspected intussusception, RLQ ultrasound is the choice of imaging
- Abdominal x-rays have very low sensitivity for intussusception, but can rule out perforation or bowel obstruction
- Most common location for intussusception is at the ileocecal junction
- For quick recurrence, repeat non-operative reduction is standard of care if the patient is stable and the previous reduction was partially successful

References

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Questions?