RADY 403 Case Presentation: Intussusception

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Patient History

• 20 month old F presents to ED with **chief concern of nonbilious nonbloody vomiting for 3 days**
• Mom reports patient has had abdominal pain with “cramping”
  • Afebrile
  • No diarrhea, but some constipation
  • Last bowel movement earlier that day
• Vital signs within normal limits
• Patient overall well-appearing & well-hydrated
  • Abdominal exam unremarkable
• Viral gastroenteritis vs. constipation-related emesis considered
• Ultimately, patient tolerated PO & was discharged home
Patient History and Workup (cont.)

• Returned to ED the next day with right-sided abdominal pain & emesis
• Tolerating very minimal PO
• Next step... imaging!
List of Imaging Studies

• Abdominal X-ray
  • Supine
  • Left lateral decubitus

• Abdominal Ultrasound
Abdominal X-rays

Mild gaseous distension of stomach & central small bowel

ill-defined RUQ mass & air fluid level

ill-defined RUQ mass
Abdominal Ultrasound

The “Target sign” is a key ultrasound finding for intussusception. It depicts a cross-section view of a round, soft tissue mass (bowel) surrounded by a hyperlucent ring of fat. This concentric “ring within a ring” appearance mimics the rings seen in a target board.
Patient Treatment & Outcome

- Air contrast enema successfully performed under fluoroscopic guidance

Before air contrast enema

Air contrast enema insufflation

Encountered lobulated soft-tissue density (intussusceptum)

Further air insufflation reducing intussusception

Successful reduction
Patient Treatment & Outcome (cont.)

• Confirmation that there was no free intraperitoneal air

BEFORE air contrast enema  

versus

AFTER air contrast enema

• Patient tolerated the procedure well & was discharged in stable condition
Discussion: Intussusception Pathology

• Occurs when a proximal segment of bowel is pulled into the distal lumen during peristalsis
Discussion: Intussusception Presentation

• Common cause of acute abdominal pain in pediatric population
  • Peak incidence between 4 and 36 months of age
• Classic triad: Intermittent abdominal pain, RUQ mass, and bloody stool
  • High positive predictive value for intussusception
  • However, classic triad is only seen in <20% of cases
• Prompt reduction required to prevent sequelae (i.e. bowel necrosis)
  • Bowel necrosis presents as “currant jelly” stool (stool mixed with blood & mucus)
Discussion: Intussusception Etiology

- In children, 90% of cases do NOT have a lead point identified
  - Possibly due to hypertrophic lymphoid tissue following an infection
- In adults, 90% of cases DO have a lead point
  - Most often due to large bowel malignancy, metastases, or small bowel lymphoma
- Example lead points in pediatric population:
  - Meckel’s diverticulum, intestinal malrotation, ectopic pancreas
- Ileocolic region = most common location for intussusception (in up to 75-95% of cases)
  - Potentially due to the anatomy of this region & abundance of lymphoid tissue
Discussion: Intussusception & Radiographs

• Intussusception on X-ray
  • In the example image to the right, there is a large RUQ soft tissue opacity appearing to bulge into the transverse colon

Images consulted from Radiopaedia.org
Discussion: Intussusception & Ultrasound

Crescent in a doughnut sign

Target sign (axial view)

Target sign (long view)

Pseudo-kidney sign

Images consulted from Radiopaedia.org
Discussion: Intussusception & Fluoroscopy

- Contrast enema remains the GOLD standard
  - Main contraindication = perforation

Before air contrast enema

Air contrast enema insufflation

Encountered lobulated soft-tissue density (intussusceptum)

Further air insufflation reducing intussusception

Successful reduction
ACR Appropriateness Criteria (revised 2019)

- Currently no listed criteria regarding intussusception in patients >3 months old and <18 y/o

**NBNB Emesis age 2 weeks – 3 months old**

**Criteria for SBO age >18 y/o**

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<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
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<tr>
<td>US abdomen (UGI tract)</td>
<td>Usually Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>Fluoroscopy upper GI series</td>
<td>May Be Appropriate</td>
<td>3</td>
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<td>Radiography abdomen</td>
<td>Usually Not Appropriate</td>
<td>3</td>
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<td>Fluoroscopy contrast enema</td>
<td>Usually Not Appropriate</td>
<td>3</td>
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<td>Nuclear medicine gastroesophageal reflux scan</td>
<td>Usually Not Appropriate</td>
<td>3</td>
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<tr>
<td>CT abdomen and pelvis with IV contrast</td>
<td>Usually Appropriate</td>
<td>3</td>
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<tr>
<td>CT abdomen and pelvis without IV contrast</td>
<td>May Be Appropriate</td>
<td>3</td>
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<tr>
<td>MRI abdomen and pelvis without with IV contrast</td>
<td>May Be Appropriate</td>
<td>3</td>
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<tr>
<td>Radiography abdomen and pelvis</td>
<td>May Be Appropriate (Disagreement)</td>
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<td>Fluoroscopy small bowel follow-through</td>
<td>May Be Appropriate</td>
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<tr>
<td>MRI abdomen and pelvis without IV contrast</td>
<td>May Be Appropriate</td>
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<tr>
<td>CT abdomen and pelvis without and with IV contrast</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>CT enterolysis</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>CT enterography</td>
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<td>MR enterography</td>
<td>Usually Not Appropriate</td>
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POCUS & Intussusception

• Systematic review & meta-analysis of patients <18y/o with abdominal signs & symptoms suggestive of intussusception in US, Korea, Taiwan, & Canada

• Of those who had intussusception, POCUS sensitivity and specificity were 95.1% (95% CI: 90.3%-97.2%) and 98.1% (95% CI: 95.8%-99.2%), respectively.
  • The positive and negative likelihood ratios were 50 (95% CI: 23-113) and 0.05 (95% CI: 0.03-0.09), respectively.

Top 3 Takeaways

• Intussusception is a common cause of acute abdominal pain in the pediatric population particularly among patients ages 4 to 36 months

• **Classic triad:** Intermittent abdominal pain, RUQ mass, and bloody stool
  • Helpful, but keep in mind this is only observed in <20% of cases

• Contrast enema remains the gold standard
  • Both diagnostic AND therapeutic
References


