Imaging Children with Crohn's: The Role of CT/MR Enteroclysis

Kimberly E. Applegate, MD, MS
Emory University

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Outline

• Evidence-based imaging of children with Crohn’s
• Small bowel imaging-role of new technology
  – Enterography, enteroclysis
• Perianal fistula: MRI
Inflammatory Bowel Disease

- 1 million Americans
- Crohn’s: 7 per 100,000
- UC: 10-15 per 100,000
- Peak onset: 15-35 years old
- Often months-years delay in diagnosis
Shifting Imaging Paradigm

• Initial SBFT still commonly performed in children with IBD...but should it?
• Our experience: all children with new dx Crohn’s undergo MR enterography (N=55)
CT Enterography

Pros
- Small bowel distention
- Neutral contrast with IV

Cons
- Compliance
- Partial SBO dx

J Dillman et al. Ped Radiol 2010;40

Image courtesy of J Dillman
VoLumen vs Oral Iodinated Contrast

15 ml/kg up to 450 mls (1 bottle) over one hour
- 1/3 each 20 min; scan at 1 hr

Conventional oral contrast for abd/pelvis CT
- 200 ml Q 30 min x 1 hour age <7 yrs
- Ditto x 90 min ages 7-12 yrs
- Ditto x 2 hours age > 12 yrs
## Imaging Diagnostic Accuracy: SBO

<table>
<thead>
<tr>
<th></th>
<th>Sens</th>
<th>Spec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiographs</td>
<td>46-69%</td>
<td>57%</td>
</tr>
<tr>
<td>MDCT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children*</td>
<td>87%</td>
<td>86%</td>
</tr>
<tr>
<td>Adults #</td>
<td>86%</td>
<td>89%</td>
</tr>
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# Assenza M et al. Hepatogastroenterology 2007;54(79):2017-23
MR Enterography and Enteroclysis

- **Pros:** cross-sectional imaging of entire abdomen; no radiation
- **Cons:** motion artifacts (cardiovascular, respiratory, and bowel peristalsis); higher cost

- MR enterography is rapidly replacing CT in children with IBD
MR Enterography

- Avoids radiation
- Easier to perform, shorter protocols (30 minutes)
- 3T MRI vs 1.5T MRI
- Use of gadolinium and fat sat is key
- Bowel anti-peristalsis agents not required
MR enterography-- Crohn’s

Courtesy of Sudha Anupindi
MR enteroclysis-- Crohn’s
Nick Gourtsoyiannis (Crete, Greece)
## Diagnosis of Perianal Disease

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
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<tbody>
<tr>
<td>MRI</td>
<td>97%</td>
<td>96%</td>
</tr>
<tr>
<td>AES*</td>
<td>92%</td>
<td>85%</td>
</tr>
<tr>
<td>Clin Exam (under anesthesia)</td>
<td>75%</td>
<td>64%</td>
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* Anal endosonography
CT Enteroclysis Pediatric experience:

- 174 children
- Ages: 2-19 yrs
- 76 Crohn’s/suspected Crohn’s
  - Partial SBO: stricture or adhesion
How is CT Enteroclysis done?

- Conscious sedation (or anesthesia)
- Nasoduodenal intubation, 13F
- Contrast infusion – limited fluoro
  - 120 ml/min of 1200-1500 ml
- MDCT acquired immediately after infusion
  (may continue infusion in CT)
- Retract catheter – decompress stomach
Enteroclysis of Crohn’s

Stricture at terminal ileum
Summary: Enterography and Enteroclysis in children

- **Enteroclysis:**
  - The importance of fluid volume challenge for detecting partial SBO
  - The importance of a negative test
    -- 92% specificity (3 yr f/u negative CTE)

- **Enterography:**
  - MR is rapidly replacing CT to decrease radiation exposure in children
Wireless Capsule Endoscopy

• First article CE in children: Clin Gastroenterol Hepatol 2005. Guilhon de Araujo Sant’Anna

• Recommended if age>10 yrs? De Angelis et al. Am J Gastro 2007;102

• Youngest child 18 months. Endoscopically placed if age<10

25mm length
Thanks!

Questions: keapple@emory.edu