**Water or Neutral Enteric Contrast for Routine CT Imaging**

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**Contrast usage still developing**

1986
1992
Now

**Inflammatory bowel disease**

- CT findings
  - Mural stratification (2 or 3 layers)
  - Mural hyperenhancement
  - Wall thickening > 3 mm
  - Vascular engorgement (comb sign)
  - Fibrofatty proliferation

**Positive versus neutral contrast**

Positive contrast
Negative contrast

**Comparison of oral CT agents**

- 900 mL
- 0.1% barium (n = 79)
  - Water (n = 75)
    - 0.1% barium superior for
      » Bowel wall visualization of stomach, duodenum, jejunum, ileum & colon p < 0.01
      » Ileum distension compared with water p < 0.01

Al-Hawary et al, RSNA 2005

**Small tumors**

- Optimized CT technique needed
  - Small bowel polyps
  - Carcinoid
  - Adenomas
  - Metastases
  - Ischemia
  - GI bleed

Al-Hawary et al, RSNA 2005
What is the value of CT enterography in GI bleeding?

4 unit GI bleed

- CTE potentially useful in significant acute GI bleed
  - May identify < 0.5cc extravasated contrast
  - No bowel prep
  - Obtain arterial and delayed scan
  - Possible value for occult GI bleed

Pitfall of oral contrast: GI bleeds

Proven bleeding duodenal ulcer

When is positive oral contrast useful?

- Four indications for positive contrast
  - Bowel obstruction
  - Fistulae / perforation
  - Contraindication to IV contrast
  - At consensus of clinician / radiologist

Ischemic SBO at CT

- Simple (n=70) or ischemic (n=66) SBO
- CT outperformed all other clinical tests

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tbody>
<tr>
<td>Serrated beak</td>
<td>47%</td>
<td>100%</td>
</tr>
<tr>
<td>Poor enhancement</td>
<td>45%</td>
<td>99%</td>
</tr>
<tr>
<td>Wall thickening</td>
<td>58%</td>
<td>95%</td>
</tr>
<tr>
<td>Ascites</td>
<td>64%</td>
<td>86%</td>
</tr>
<tr>
<td>Mesenteric root engorgement</td>
<td>33%</td>
<td>100%</td>
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<tr>
<td>Mesenteric root haziness</td>
<td>35%</td>
<td>100%</td>
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SMA embolus: Bowel infarct
Increased radiation dose

Scan 1: CTDIvol: 9.0mGy
Scan 2: CTDIvol: 10.5mGy

Wang, Yeh et al. Eur J Rad 2011

Take home points

• Tailor use of contrast to clinical need
• Pitfalls of positive oral contrast
  – May obscure ischemic bowel, GI bleed, some tumors
  – May cause pseudo-wall thickening
  – Slightly higher radiation dose & aspiration pneumonitis risk

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