How Should a Patient With Suspected Crohn’s Disease Be Evaluated?

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Case Presentation

• 23-year-old woman with abdominal pain, fatigue and diarrhea
  – Pain is often post-prandial
  – 5-6 stools per day with urgency, no blood
  – Weight loss of 10 pounds over 2 months
• Mild RLQ abdominal tenderness, no mass
Case Presentation

- Hemoglobin 10.8 g/dL, MCV 76 fL
- C-reactive protein 25 mg/L (normal range up to 8 mg/L)
- Colonoscopy normal
  - BUT couldn’t intubate ileum
- EGD with small bowel biopsy normal, gastric biopsy chronic gastritis, *H. pylori* negative
- SBFT normal
In this patient with diarrhea, pain, weight loss, anemia, and elevated CRP with normal colonoscopy and SBFT, what if anything should be done?

A. Nothing
B. Nortriptyline
C. Capsule endoscopy
D. CT enterography
E. Either C or D
Overview

- Colonoscopy and SBFT
- Serologies
- Capsule endoscopy
- CT enterography
- MR enterography
Diagnosis of IBD

- Clinical diagnosis
- No single test is pathognomonic
- Clinician needs to integrate information from multiple sources to arrive at diagnosis
  - history and physical
  - colonoscopy and ileoscopy
  - small bowel and colonic biopsies
  - small bowel follow-through or CT enterography
  - serologies?
  - fecal markers?
  - capsule endoscopy?
Colonoscopy/Ileoscopy

- Single test that may approach “gold standard” of clinical diagnosis

- Pros
  - Reaches terminal ileum
  - Direct visualization of mucosa
  - “Tissue is the issue”

- Cons
  - Can’t visualize proximal or mid-small bowel
  - Invasive
  - Expensive
UC – Endoscopic Spectrum of Severity

Normal

Mild

Moderate

Severe
CD – Endoscopic Appearances

- **Aphthous ulcers**
- **Stellate ulcers**
- **Longitudinal or serpiginous ulcers**
- **Cobble-stoning of mucosa**
“Old Radiology”
Small Bowel Follow-Through

• Operator dependent – requires an experienced and interested radiologist
  – Real-time fluoroscopy – time consuming
  – Requires manipulation of abdomen to isolate small bowel loops
• Negative silhouette – misses mild disease
Serologic Tests For Inflammatory Bowel Disease

- Anti-neutrophil cytoplasmic antibody with perinuclear staining (pANCA)
- Anti-*Saccharomyces cerevisiae* (ASCA)
- Antibody to *Escherichia coli* Outer membrane porin C (OmpC)
- Antibody to *Pseudomonas fluorescens* transcription factor (I2)
- Anti-flagellin antibodies (CBir1)
## ASCA Combined With pANCA to Differentiate Subtypes of IBD

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pANCA+</td>
<td>50-65*</td>
<td>85-92*</td>
</tr>
<tr>
<td>ASCA+</td>
<td>55-61**</td>
<td>88-95**</td>
</tr>
<tr>
<td>pANCA+ ASCA-</td>
<td>44-57*</td>
<td>81-97*</td>
</tr>
<tr>
<td>pANCA- ASCA+</td>
<td>38-56**</td>
<td>94-97**</td>
</tr>
</tbody>
</table>

* Indicates UC  
** Indicates Crohn’s

Serologies in Indeterminate Colitis

- 97 Belgian IC patients underwent serologies
- Seronegative for both ASCA and pANCA in 49%
  - Most remained indeterminate (85%)
- ASCA+/pANCA- in 27%
  - 31% of these Crohn’s, 8% UC, 61% stayed IC
- pANCA+/ASCA- in 21%
  - 20% of these Crohn’s, 35% UC, 45% stayed IC
- Serologies may “accelerate” a definitive diagnosis in a fraction of IC patients

Joossens et al, Gastroenterology 2002;122:1242-7
Small intestinal Crohn’s disease as seen by capsule endoscopy

- Detects erosions in suspected Crohn’s disease with negative SBFT / colonoscopy
- Need blinded comparison studies vs other imaging to calculate true sensitivity and specificity
- Need to determine specificity (prevalence of SB erosions in general population)
- Need to clarify safety in stricturing Crohn’s disease – patency capsule may help
# Meta-analysis of capsule endoscopy (CE) vs various visual diagnostic techniques

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Total # of patients</th>
<th>Test modality</th>
<th>Yield CE (%)</th>
<th>Yield test (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>250</td>
<td>SBFT</td>
<td>63</td>
<td>23</td>
<td>&lt;0.001</td>
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<tr>
<td>4</td>
<td>114</td>
<td>Ileoscopy</td>
<td>61</td>
<td>46</td>
<td>0.02</td>
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<tr>
<td>3</td>
<td>93</td>
<td>CTE</td>
<td>69</td>
<td>30</td>
<td>0.001</td>
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<tr>
<td>2</td>
<td>84</td>
<td>PE</td>
<td>46</td>
<td>8</td>
<td>&lt;0.001</td>
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<tr>
<td>1</td>
<td>18</td>
<td>MRI</td>
<td>72</td>
<td>50</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Triester et al, Am J Gastroenterol 2006 May; 101(5): 965
Small-Bowel Imaging in Crohn’s Disease: Prospective Blinded 4-Way Study With Consensus Reference Standard

CTE and CE were equally sensitive but CE was less specific than other 3 modalities.

Capsule retention

Low incidence in suspected Crohn’s
As high as 13% in known Crohn’s?

Images compliments of Asher Kornbluth, MD
CT Enterography

- Combines high-resolution CT scanning with some of the concepts of barium radiography
- Ingestion of large volume of a negative contrast agent (either PO or via NJT) to distend loops
  - water or diluted PEG or diluted methylcellulose or highly diluted barium sulfate in sorbitol
- Intravenous contrast, scan after 70 seconds (venous phase)
- Thin slices on helical CT
Mural stratification
Trilaminar: mucosa, submucosa, serosa
Mural hyperenhancement

Crohn’s stricture with proximal dilation

Rx: Resection
Extraluminal Findings
(about 18 - 20%)

- Hepatobiliary - stones, PV clot, abscess, PSC
- Pancreatitis
- Sacroiliitis
- Nephrolithiasis
- AVN
CTE - Challenges

• Optimize jejunal distention, maximize gastric emptying
• Reduce radiation dose
• Understand temporal changes on CTE following medical therapy
• Reproducibly quantitate disease burden
• Integrate CT assessments of CD severity with established indices
Ileosigmoid fistula: CT vs MR enterography
Conclusions

- Colonoscopy with biopsy remains the primary method of diagnosis in patients with suspected Crohn’s disease
- But often needs to be combined with small bowel assessment
- SBFT is insensitive in many operators’ hands
  - Need a dedicated and experienced barium radiologist
Conclusions

- Capsule endoscopy (CE) is extremely sensitive and may detect small bowel lesions in those with suspected Crohn’s, but who show up negative on conventional tests
  - Specificity and retention are concerns
- CT enterography is a noninvasive method of diagnosing or assessing disease activity in suspected / known Crohn’s
  - Complementary to SBFT, but potentially more sensitive
  - Probably equally sensitive as CE, possibly more specific
- MRI enterography is rapidly improving - no radiation