Occult and Overt GI Bleeding: Small Bowel Imaging

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Outline of Talk

• Definition of Small Bowel Bleeding vs. OGIB
• Causes of Small Bowel Bleeding
• Options for Diagnosis and Management
  • Repeat Upper and Lower Endoscopy
  • Push Enteroscopy
  • Video Capsule Endoscopy
  • Deep Enteroscopy
  • CT or MR Enterography
  • Nuclear Scans/Angiography
  • Surgery/Intra-Operative Enteroscopy
Gastrointestinal Bleeding

Upper Tract 85%
- Esophagus
- Stomach
- Duodenum

Middle Tract 5%
- Small Intestine

Lower Tract 10%
- Colon

Obscure Gastrointestinal Hemorrhage: Traditional Definition

- Absence of identified source of bleeding after normal upper endoscopy, colonoscopy, & small bowel radiographic evaluation
- Obscure/overt: Frank bleeding with or without iron deficiency
- Obscure/occult: Guaiac positive stool with iron deficiency

Raju, Gerson, Gastroenterology 2007
Lauren B. Gerson, MD, MSc, FACG

Time to Redefine “Obscure” GI Bleeding

- Lesions in the upper or lower GI tracts on repeat endoscopy found in 30-40% of patients.¹
- Yield of VCE and Deep Enteroscopy in Suspected Small Bowel Disorders close to 60%.²
- Approximately 40-50% of patients with negative VCE found to have lesions on CTE.³
- OGIB reserved for patients with bleeding despite VCE, Deep Enteroscopy, and CTE/MRE Examinations

1. Fry, APT 2009
2. Pasha, CGH 2008
3. Agrawal, J Gastro & Hepatology 2012

<table>
<thead>
<tr>
<th>UGI &amp; LGI Bleeding Overlooked</th>
<th>MGI Bleeding</th>
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<tbody>
<tr>
<td><strong>UGI Lesions</strong></td>
<td><strong>Below 40 years of age</strong></td>
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<tr>
<td>Cameron’s erosions</td>
<td>Tumors</td>
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<tr>
<td>Fundic varices</td>
<td>Meckel’s diverticulum</td>
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<td>Peptic ulcer</td>
<td>Dieulafoy’s lesion</td>
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<tr>
<td>Angiodysplasia</td>
<td>Crohn’s disease</td>
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<tr>
<td>Dieulafoy’s lesion</td>
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<tr>
<td>Gastric Antral Vascular Ectasia (GAVE)</td>
<td>Above 40 years of age</td>
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<tr>
<td>Celiac Disease</td>
<td>Angiodysplasia</td>
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<td>NSAID enteropathy</td>
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<tr>
<td><strong>LGI Lesions</strong></td>
<td><strong>Uncommon</strong></td>
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<tr>
<td>Angiodysplasia</td>
<td>Hemobilia</td>
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<td>Neoplasms</td>
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<td></td>
<td>Hemosuccus pancreaticus</td>
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<td>Aortoenteric fistula</td>
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Small Bowel Imaging

**Enterography**
- Double Balloon
- Single Balloon

**Angiography**

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<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Modality</th>
<th>No. Pts/DY</th>
<th>Yield EGD/Colo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zaman, 1998</td>
<td>PE</td>
<td>95 (41%)</td>
<td>EGD-25 (64%)</td>
</tr>
<tr>
<td>Descamps, 1999</td>
<td>PE</td>
<td>233 (53%)</td>
<td>EGD-25 (10%)</td>
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<tr>
<td>Lara, 2005</td>
<td>PE</td>
<td>32 (47%)</td>
<td>EGD – 13 (40%)</td>
</tr>
<tr>
<td>Fry, 2009</td>
<td>DBE</td>
<td>107 (65%)</td>
<td>EGD-13 (12%) Colon – 12 (11%)</td>
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<tr>
<td>Van Turenhout, 2010</td>
<td>VCE</td>
<td>592 (49%)</td>
<td>EGD - 32 (17%) Colon – 8 (4%)</td>
</tr>
<tr>
<td>Lorenceau-Savale, 2010</td>
<td>VCE</td>
<td>35 (0%)</td>
<td>EGD or colon 8/13 (62%)</td>
</tr>
<tr>
<td>Robinson, 2011</td>
<td>VCE</td>
<td>707 (40%)</td>
<td>EGD – 22 (3%) Colon – 6 (1%)</td>
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</tbody>
</table>
Push Enteroscopy

- Pediatric colonoscope or dedicated push enteroscope
- Examines upper tract to jejunum (70 cm distal to Treitz)
- Overall diagnostic yield is 53% (3-70%), mainly AVMs
- Allows for diagnosis and therapy
- Overtube does not increase diagnostic yield
- Most lesions are within reach of conventional endoscope
- Limitations: Looping and Discomfort
- Ideal for Second Look Examinations

Raju, Gastroenterology 2007
Hayat, Endoscopy 2000
Zaman, GIE 1998

Video Capsule Endoscopy (VCE)

- Painless and total SB visualization
- Third test after negative EGD and colonoscopy
- Better diagnostic yield (45-77%) than SB series/PE
- Complete to cecum in 79-90%
- High positive (94-97%) and NPV (83-100%) in the evaluation of OGIB
- Diagnostic Yield improved with bowel preparation
- Endoscopic placement for inpatients and gastroparesis
- Poor visualization of proximal SB

Pennazio, Gastroenterology 2004
Delvaux, Endoscopy 2004
VCE Diagnostic Yield and Repeat VCE

• Factors Associated with Increased Diagnostic Yield:
  – Overt Bleeding
  – Performance within 2 weeks of bleeding episode
  – Hemoglobin value < 10 gm/l
  – Repeat Bleeding episodes
  – Male Gender, Age > 60
  – Cardiac (Heyde’s Syndrome) and Renal Disease

• Yield for Repeat VCE
  – 50-75%
  – Wait for recurrent overt bleeding

• Less Data regarding utility of repeat enteroscopy

Bresci, J Gastroenterol 2005
Carey, Am J Gastro 2007
Svarta, Can J Gastroenterology 2010
Viazis, GIE 2009
Deep Enteroscopy

- Duration of procedure
  - Continue until no progress or reach target
  - 1 to 1.5 hours in most reports
- Interventions
  - Can use most colonoscopy tools and devices through 2.8mm channel: biopsy, snares, APC, Bicap, hemostatic clips, Roth net, injection needles, TTS balloons
- DBE established new diagnosis:
  - 34% to 80%
- DBE leads to therapeutic intervention:
  - 42% to 76%
- Total enteroscopy possible:
  - 40 to 80% with experience
- Impact on outcome can be uncertain:
  - GIAD often demonstrate recurrent bleeding
  - Risk factors include cardiac and renal disease

CT scan versus CT Enterography

Routine CT

CTE
Imaging Recommendations

- CTE should be performed after negative VCE when small bowel bleeding suspected
- CTE preferred over MRE unless younger patient
- Consider CTE prior to VCE in the setting of abdominal pain, IBD, prior radiation therapy, previously small bowel surgery and/or suspected small bowel stricture or obstruction
- CTE can be performed after negative standard CT scan

Gerson, Cave, Fidler, Leighton AJG Guideline 2015

Tagged Scans, CTA, and Angiography

- Tagged Scintigraphy if Slower Rates Bleeding (0.1-0.2 ml/min)
- Perform angiography if massive overt bleeding and hemodynamic instability
- CTA preferred in stable patients to increase diagnostic yield and guide timing of angiography
- CTA preferred over CTE in active overt bleeding
Intra-Operative Enteroscopy (IOE)

- Insertion of enteroscope via surgical incision
- Highly invasive with high morbidity and mortality rates close to 20%
- Diagnostic yield 58-88% but recurrence bleeding up to 60%
- Indication: incomplete enteroscopy due to adhesions

Douard, Am J Surgery 2000
Zaman, GIE 1999

Comparative Studies

- VCE versus SBFT and PE¹
  - Yield VCE 56% PE 26% (30% increased DY)
  - Yield VCE 42% SBFT 6% (36% increased DY)
  - NNT=3
- DBE versus PE²
  - Yield 73% versus 44%
- VCE versus DBE³
  - Similar Yield 60% for each
- DBE versus SBE versus Spirus: similar yields

1. Treister, Am J Gastro 2005
3. Pasha, CGH 2008
4. Rahmi, J Gastroenterol & Hep 2013
Take Home Points

- Small bowel bleeding is uncommon (5%) but accounts for significant hospital costs, patient morbidity, and impact on quality of life

- 20-30% of patients with “obscure” bleeding will have a source within reach of a standard endoscope

- Second look EGD if high suspicion or prior incomplete examination

- Redefine obscure bleeding as ongoing bleeding after negative endoscopy, VCE, and CTE examinations

Take Home Points

- Capsule endoscopy is recommended as the third diagnostic test after EGD/colonoscopy
  - Directs subsequent enteroscopy examination
  - Similar yield to enteroscopy without risk of complications (except for retention)
  - Repeat capsule examinations shown to have high yield 50-75%
  - Capsule examinations within 2 weeks of bleeding episodes associated with higher diagnostic yields
Take Home Points

- Perform CTE after negative VCE/enteroscopy or in patients with suspected stricture
- Multiphasic CT scans can be considered in stable patients with overt bleeding to guide further management
- Consider angiography in hemodynamically unstable patients with ongoing bleeding
- Empiric deep enteroscopy could be considered in the following scenarios:
  - Patients with known angiodysplastic lesions in the upper or lower GI tract
  - Patient with suspected upper small bowel lesion (such as suspected neoplasm on imaging test)
  - Patients with ongoing suspected SB bleeding

Thank You For Your Attention!