Deep Enteroscopy: How Low Can You Go?

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Disclosure

• None
Objectives

• Technical aspects
• Applications and therapeutic options
• Potential complications
• Practical integration

History

• Obscure bleeding (OGIB) in 5%
• Cost of care high, outcomes not ideal
• Push enteroscopy (PE) for OGIB
  • Diagnostic yield varied (25-41% cited)
• Capsule endoscopy (CE) for OGIB
  • Diagnostic yield higher- NO therapy

ASGE standards of practice committee. Role of endoscopy in OGIB. GIE 2010
AGA position statement. Gastroenterology 2007
Adler et al. GIE 2004;59:492-498
Overtube Evolution

- Beyond ligament of Treitz or IC valve
- “Pleat” against fixed point (Treitz/valve)
  OR
  Rotationally “pleat” onto spiral overtube
- Straightens for easier pushing

Where we are

Single Balloon

Double Balloon

Spiral
Deep Enteroscopy (DE) = Mid Bowel

- Balloon-assisted Enteroscopy (BAE)
- Double Balloon Enteroscopy (DBE): Fujinon
- Single Balloon Enteroscopy (SBE): Olympus
- Spiral Enteroscopy (SE): Olympus

Double-balloon method
Double-balloon method
Double-balloon method
Double-balloon method
Video Case
Clinical applications

- Obscure bleeding diagnosis/treatment
- Biopsy of small bowel pathology
- Tattoo placement
- Polypectomy
- Foreign body removal
- Dilation

ASGE technical review: Enteroscopes. GIE 2007:66:872

Clinical applications

- Altered anatomy ERCP
- PEJ or PEG in altered anatomy
- Stenting

Sato et. al. GIE 2005;61:AB238
Haruta et. al. Liver Transplantation 2005;11(12):1608
Ross et. al. GIE 2006;64(5):797
Despott et. al. Dig Dis Sci 2011;56:494
Ross et. al. GIE 2006;64(5):835-7
Lennon et. al. GIE 2010;71:422-5
Clinical Applications: Yield

• When studied prospectively, DBE visualized >200cm of small bowel with a diagnostic yield of 63% while push enteroscopy with an overtube visualized <100 cm with a diagnostic yield of 44%.

May et al. Am J Gastroenterol 2006;101:2016-24

Clinical Applications: Yield

• Diagnostic yield doesn’t = sensitivity
  • gold standard? intra-operative
• Case series
  • few are large
  • fewer are prospective
• Meta-analysis and composite data

Ross A. A decade of DBE: what have we learned. GIE 2011;74(3):571
Clinical Applications: Yield

• Meta-analysis of small bowel DISEASE
  • Comparing CE and DBE Diagnosis
    • Yield 60 vs. 57% (11 studies)*
    • Yield 62 vs. 50% (8 studies- 191 pt. subgroup)**
      • Yields based on antegrade OR retrograde DBE
      • In 22 pts. When BOTH performed, 46% vs. 88%

* Pasha et al. DBE and CE have comparable diagnostic yield in SB disease: a meta-analysis. Clinical Gastroenterology and Hepatology 2008;6:671-6

Clinical Applications: Yield

• Meta-analysis of obscure BLEEDING
  • Comparing CE and DBE Diagnosis
    • Yield 62 vs. 56% combining 10 studies
      • odds ratio CE vs DBE 1.39 (95% CI .88-2.2;p=.16)
    • Subgroup analysis DBE after POSITIVE CE
      • Yield 75% (95% CI 1.09-2.96;p=.02)
    • Subgroup analysis DBE after NEGATIVE CE
      • Yield 27.5% (95% CI 16.7-37.8)

Teshima et al. DBE and CE for obscure GI bleeding: an updated meta-analysis. Journal of Gastroenterology and Hepatology Oct. 5 2010
Clinical Applications: Yield

• Retrospective Multicenter reviews
  • Procedure numbers greater than 2000*
  • Therapy performed in 27-35%*
  • Complications up to 4.3% with therapy*
  • Less complications subsequent report**

** Möschler et al. Endoscopy 2011;43:484

Clinical Applications: Yield

• SBE studied retrospectively in 172 pts.
  • 83% antegrade, 17% retrograde
  • Diagnostic yield 58%
  • Therapy performed in 42%
  • No complications reported

Clinical Applications: Yield

• SE studied prospectively in 148 pts.
• 10 centers with centralized database
• Antegrade procedures
• Deemed successful in 93% of patients
• Minor complications noted
• Diagnostic yield of 65% (44% definite)
  • Therapy= APC, biopsy, polypectomy, tattoo


Clinical Applications: Yield

• Which system is better?
  • Total enteroscopy ??
    • DBE appears better at total enteroscopy*
  • Procedure time ???
    • Spiral enteroscopy reportedly faster**
  • Comfort and safety ????

Domagk et al. Endoscopy 2011;43:472
*Takano et al. GIE 2011;73:734
**May et al. Endoscopy 2011;43:477
Buscaglia and Okolo. GIE 2011;73(5):1023
Welch et al. GIE 2012;75(5):1125-6
Clinical Applications: Outcomes

- Diagnostic Yields are better than ever
- Endoscopic therapy rates seem higher
- Safety appears reasonable (DBE)
- Surgery may be better directed

Case Question

A 41 year old patient with Peutz-Jegher’s syndrome who underwent double balloon enteroscopy earlier in the day calls the answering service complaining of worsening abdominal pain. After directing the patient to the ER where you plan to assist in the evaluation, you look up details of the procedure. A moderate stenosis at a prior small bowel anastamotic site was balloon dilated to 14mm to facilitate overtube passage and two 20-30mm presumed hamartomas were removed with snare cautery from the jejunum and proximal ileum during the procedure. The patient had mild abdominal pain after the procedure that was presumed related to air distention of the small bowel and was discharged from the endoscopy unit. What pathology is the most likely explanation for the worsening abdominal symptoms?

a. pancreatitis  
b. intussusception  
c. post-polypectomy bowel wall injury  
d. dilation related perforation
Practical integration

Overt Obscure GI Bleeding

Active Bleeding

Suspected Upper GI Bleeding

Repeat EGD or PS

Other GI Bleeding

Inactive Bleeding

Ongoing Endoscopy

Consider CT Enterography or CT Angiography

Consider Video Capsule Endoscopy and/or Colonoscopy

Consider CT Enterography, Deep Enteroscopy, Push Enteroscopy, and/or Colonoscopy

Video Capsule Endoscopy and/or Colonoscopy

Angiography

Recurrent Bleeding

No Recurrent Bleeding

Figure 2 (Occult OGB Algorithm)

ASGE standards of practice committee. Role of endoscopy in OGB. GIE 2010

Remember your history....

• “Obscure” bleeding
  • missed bleed? repeat standard endoscopy
  • proximal bleed? push enteroscopy
  • massive bleed? radiology/intra-operative
  • provoked bleed? medication withdrawal
  • benign chronic bleed? iron, ? IV iron
Chronic Bleeding “historically” or “technologically”

Does Capsule Endoscopy Improve Outcomes in Obscure Gastrointestinal Bleeding? Randomized Trial vs. Dedicated Small Bowel Radiography

Loren Laine, Amandeep Sahota, Abbid Shah

Conclusions: “The significant improvement in diagnostic yield with capsule endoscopy may not translate into improved outcomes in a population with obscure GI bleeding. Most patients do well whether or not abnormalities are identified, and additional diagnostic or therapeutic interventions may be necessary whether or not capsule endoscopy identifies a source of bleeding.”

1) Remember push enteroscopy
2) Clinical follow-up and patient-based management
3) Tumors and Crohn’s are rare events

Case Question

A 37 year old female with a history of Roux-en-Y gastric bypass surgery presented with melena requiring transfusion therapy and had an EGD today which revealed a tight gastrojejunal anastomosis that could accommodate the standard upper endoscope with minimal resistance and no lesions or bleeding sources to the limits of scope passage. She continues to pass melena and require blood transfusion. Of the following endoscopic options, which is most appropriate and likely to have the highest therapeutic yield:

a. colonoscopy
b. push enteroscopy
c. single balloon enteroscopy
d. spiral enteroscopy
e. intra-operative enteroscopy
Case Presentation #1

- 53 year old female
- Abdominal pain and loose BM’s
- Takes NSAIDs for osteoarthritis
- Hemocult positive in past
- Mildly elevated ESR
- Negative EGD and colonoscopy

Capsule findings

- Total SB transit time= 202.75 min.
- Denuded villi/erosion= 8%
- Polypoid abnormality= 46%
% Small Bowel Passage

- Within 75% passage consider antegrade (DBE)*
- Greater than 60% SB passage consider retrograde DBE**

*Gay et al. Outcome of CE determining indication and route. Endoscopy 2006;38:49
**Li et al. Predictive role of CE on insertion route DBE. Endoscopy 2009;41:762

Mayo Approach

- 95 abnormal CE findings
- 56 (59%) presumably identified by enteroscopy
- Majority of findings = vascular ectasia
- % transit time/cut off values studied
  - PE(<21%), antegrade SBE(<31%), antegrade DBE(<46%), retrograde DBE(>75%)

Chalazan B, Gostout CJ, Kee Song WK, Enders F, Rajan E GIE 2011, 73(4S) AB447
What would you do?

A. Advise avoid NSAIDS and observe
B. Advise repeat capsule in one year
C. Advise PE and biopsy / therapy
D. Advise DE and biopsy / removal

If Deep Enteroscopy....

A. Single balloon enteroscopy
B. Double balloon enteroscopy
C. Spiral enteroscopy
Case Presentation

- 85 y.o. male
- Pain- worse with defecation and urination
- Anorhexia and 50 lb. wt. loss over 6 mos.
- Denies aspirin/NSAIDS
- Hemocult positive without anemia in past
- EGD and colonoscopy negative
- CT enterography findings

The Problem.....

- Colonoscopy and terminal ileum (TI) normal
- Initial DBE failed to advance beyond TI

*31 % failure rate of Lower DBE initially
*Rate improves to 10-15% with >20 exams

Mehdizadeh et al. Gastrointest Endosc 2006;64:740-50
The Solutions

• Insist on Good Prep
• Utilize position and pressure if needed
• Reduce sigmoid then transverse then ascending
  * Approach IC valve with straight scope
  * Avoid retroflexed entry into T.I.
• Positions, pressure, glucagon
• Scope stiffeners, wires, balloons
• Cecal visibility problematic (air loss from overtube)
• Pass as far as possible into ileum before first reduction
Case #2 video

Case #3

- 56 y.o. female
- History of NHL
- Evolving anemia with heme + stool on one occasion
- CE revealed a bulge in distal SB
- Referred for lower DBE
### Costs of evaluation

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Total Charge $21,133
Total Pay $5,709

### Case presentation #4

- 80 y.o. male
- Iron deficiency anemia
- MALT Lymphoma history
- CAD/TIA on aspirin and clopidogrel
- Referred for deep enteroscopy after CE revealed AVM’s
What would you do?

Vascular lesions and recurrent bleeding

- > 40% recurrent bleeding after DBE therapy
- ? Medically manage/withdraw medications

May et al. Endoscopy. 2011 Sep; 43(9):759-65
Case Presentation #5

- A 50 year old male presents with a 5 year history of iron deficiency anemia and intermittent melena. He has undergone prior evaluation including upper and lower endoscopy x2, push enteroscopy, and capsule endoscopy x2. The evaluation has been unrevealing for a source.
Capsule Endoscopy

SBE
Surgical pathology

Summary

- Deep Enteroscopy = Pleat and Straighten
- How low you NEED TO GO depends....
Summary- Future Directions

• Well designed prospective outcomes studies
• Cost
  • provider(s)
  • third party payer
  • society

Summary- Future Directions

• Longitudinal care by 1° providers
  • GI “missing” a tumor
  • Cards “failing to prevent” a MI or stroke

  • The algorithm/technology
  • The professional
  • The institution or “cost center”
  • The third party payer
  • The society
  • The patient