Capsule Endoscopy and Deep Enteroscopy

Are they complementary?

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Disclosure

Nothing to disclose
• 42 y/o woman with fatigue / weakness; no other symptoms
  ■ Menses normal
  ■ Normal physical examination
  ■ Bloodwork: HGB 8, MCV 77, Ferritin 10, TIBC sat 8%
  ■ EGD + colonoscopy normal incl TI to 10 cm proximal to ICV

• What would you do next?
78 y/o woman with abdominal pain, distention with meals, 15 lb weight loss over 3 months

- Normal physical examination
- Bloodwork: HGB 11, MCV 88, alb 2.9
- EGD nl; colonoscopy 2 small tubular adenomas, TI normal, both by you
- CT with thickening proximal jejunum

What would you do next?
Background

Enteroscopy indications

- Diagnostic
  - Obscure GI bleeding
  - IBD
  - Other abnormal radiologic findings
  - Small intestinal lesions (polyps, masses)
  - Post-surgical complications

- Therapeutic
  - Hemostasis
  - Stricture dilation / stent placement
  - Polypectomy
  - Foreign body retrieval
Background

- Origins of modern enteroscopy
  - Crosby capsule
  - Colonoscope
    - With and without fluoroscopy
  - Sonde enteroscope
  - Push enteroscope
  - Push enteroscope with overtube
  - Intraoperative enteroscopy
    - Open
    - Laparoscopic
**Background**

- **Enteroscopic options today**
  - Push enteroscopy using colonoscope
  - *Push enteroscope without overtube
  - *Push enteroscope with overtube
  - Intraoperative enteroscopy
    - *Open
    - Laparoscopic
  - Deep enteroscopy
    - Video-capsule endoscopy (VCE)
    - Balloon enteroscopy (push + pull)
    - Rotational overtube enteroscopy (push + pull)
Background

- Deep enteroscopy: the entire small bowel can (potentially) be visualized
  - Deep capsule endoscopy
  - Deep flexible enteroscopy
    - Balloon enteroscopy
      - Single-balloon (SBE)
      - Double-balloon (DBE)
    - Rotational enteroscopy
- Caveats
  - Long procedure time
  - Non-capsule methods may require GA
  - Technically challenging; may require fluoro
Background

- Deep enteroscopy: diagnostic only
  - Video-capsule enteroscopy (VCE)

Beware of potential strictures and risk of obstruction…
Background

- Deep enteroscopy: diagnostic and therapeutic
Background

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Background

- Deep enteroscopy: diagnostic and therapeutic
Background

- Deep enteroscopy: diagnostic and therapeutic
Background

Overtube        Scope

Overtube        Scope

Overtube        Scope

Overtube        Scope

Reduction

40 cm

Courtesy Patrick Pfau, MD, University of Wisconsin.
Background

- Deep enteroscopy: diagnostic and therapeutic
  - Rotational enteroscopy
Performance characteristics

- Deeper insertion = superior visualization compared to push enteroscopy
- Total small intestinal examination in 12-25%; diagnostic yield 40%
- Clinical yield for VCE and DBE equivalent: 60%

Balloon enteroscopy caveats

- It takes a long time…
  - 120-200 minutes peroral or retrograde
- Effortful
  - May require anesthesia (logistical issues, risk, cost)
  - Skill acquisition
- Requisite expertise
  - Diagnostic
  - Therapeutic
Balloon enteroscopy caveats

- Surgical anatomical caveats: fixed bowel
  - Peritoneal adhesions
  - Anatomotic strictures
  - Esophageal strictures
Balloon enteroscopy caveats

- Surgical anatomical caveats: fixed bowel
  - Roux-en-Y anatomy
    - Anastomoses
      - Ectatic anastomoses
      - Hairpin turns
        - Fixed
        - Scope radius
        - Scope stiffness
    - Peritoneal windows
    - Gastric looping
      - Hiatal hernia
Balloon enteroscopy caveats

- Surgical anatomical caveats: fixed bowel
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Deep enteroscopy complications

- Balloon enteroscopy
  - Post-procedure distention/pain common (> 20%)
  - Major complication rate 0.8 – 5 %
    - Perforation 1-3%
    - Higher when intervention added
    - Rare pancreatitis

Clinical application

• Capsule enteroscopy and balloon / rotational enteroscopy are complimentary
  
  ▪ Consider capsule first given non-invasive, with lower complication risk and no sedation requirement
  
  ▪ Consider going straight to rotational or balloon enteroscopy if suspicion for treatable lesion is high
Clinical application

- Capsule enteroscopy and balloon / rotational enteroscopy are complimentary (continued)
  - Positive capsule findings
    - Tissue acquisition
    - Treatment
  - Negative capsule findings
    - ...with persistent strong clinical suspicion for intestinal pathology
Clinical application

- Choice of deep enteroscopy platform is largely institution-dependent, and institutionally-driven
  - Endoscope manufacturer holding contract for unit
  - Availability of local operator experience and expertise
  - Applies to capsule as well as balloon / rotational enteroscopy
Clinical application

● In general:
  ● Choose capsule if
    ✦ Purely diagnostic
    ✦ Stricture unlikely or excluded
    ✦ Radiologic studies are negative
  ● Choose push enteroscopy with colonoscope if likely to be near ligament of Treitz or TI
    ✦ Easier, faster
    ✦ Larger channel for aspiration, accessories
    ✦ Dial-in stiffening feature, flushing pump capability
  ● Consider quick repeat EGD first in appropriate cases, particularly if you didn’t perform the index EGD
Clinical caveats
Clinical caveats

Illustration: John E. Pandolfino, MD
Clinical caveats

- 62 y/o man 2 years s/p lap RYGB; persistent anemia, no pain, lost 120 lbs

Look beyond!
Clinical caveats

- 62 y/o man 2 years s/p lap RYGB; persistent anemia, no pain, lost 120 lbs

Wash well, look carefully!
Clinical caveats

- 27 y/o man with cerebral palsy, admitted with maroon stools for 24 hrs; no abdo pain, no N/V, no NSAIDs
  - Dark maroon blood per rectum
  - In ED: P 150, BP 80/50, orthostatic
  - Bloodwork: HGB 7.9, MCV 88, alb 2.9
  - Now in ICU hydrated, transfused
  - Still with maroon blood per rectum

- What would you do next?
Clinical caveats

- EGD normal
- Colonoscopy: red blood oozing from ICV; TI mucosa nl 5 cm upstream
- Meckel’s scan normal
Clinical caveats

- CT enterography
  - “bleeding protocol”
Clinical caveats

- Mesenteric arteriography
Clinical caveats

- Balloon enteroscopy
Clinical caveats
Clinical caveats
Clinical caveats
Conclusion

- Capsule and balloon overtube / rotational overtube enteroscopy are complimentary technologies
- Present-day enteroscopic technology provides the capability to visualize the entire small bowel
- All possess greater potential to visualize and lead to successful endoscopic treatment of small bowel lesions than conventional small bowel endoscopic techniques
- Balloon and rotational enteroscopy techniques still possess a steep learning curve, and require substantial investments of time and resources