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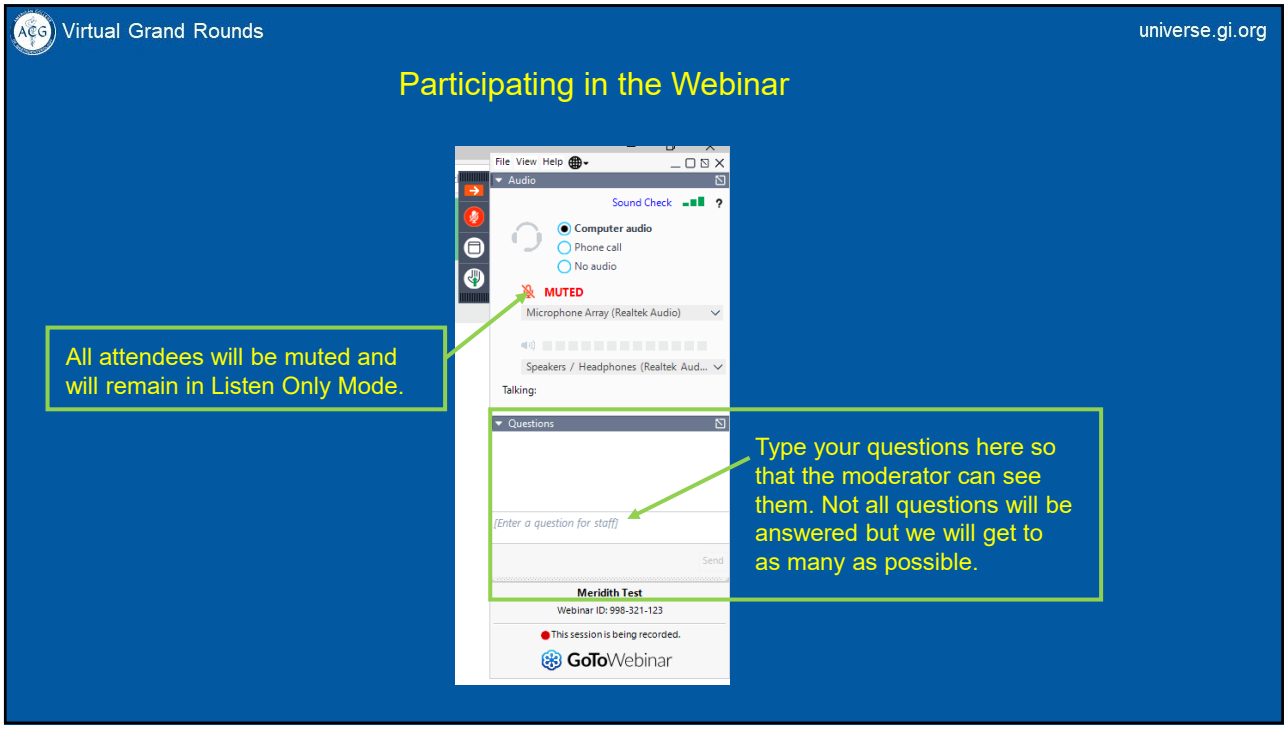
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ACG will send a link to a CME & MOC evaluation to all attendees on the live webinar.

ABIM Board Certified physicians need to complete their MOC activities by December 31, 2021 in order for the MOC points to count toward any MOC requirements that are due by the end of the year. No MOC credit may be awarded after March 1, 2022 for this activity.

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MOC QUESTION

If you plan to claim MOC Points for this activity, you will be asked to: Please list specific changes you will make in your practice as a result of the information you received from this activity.

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ACG Virtual Grand Rounds

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Week 19, 2021
Diagnosis and Management of Pancreatic Cystic Lesions
Somashekar G. Krishna, MD, MPH, FACG
May 13, 2021 at Noon Eastern

Week 20, 2021
ACG Clinical Guidelines: Colorectal Cancer Screening 2021
Aasma Shaukat, MD, MPH, FACG
May 20, 2021 at Noon Eastern

Visit **gi.org/ACGVGR** to Register

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ACG VIRTUAL GRAND ROUNDS

Allyship and Action: In Solidarity Against Anti-Asian Racism

MONDAY, MAY 10, 8-9:30 PM EDT

Moderators
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Immanuel K. H. Ho, MD, FACG

Speaker
Stella S. Yi, PhD, MPH

Panel
William D. Chey, MD, FACG
Monica Nandwani, NP
Linda Anh B. Nguyen, MD
Calvin Q. Pan, MD, FACG
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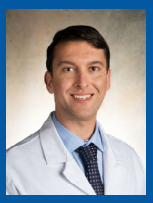
Disclosures:

Speaker:
Carol E. Semrad, MD, FACG
Dr. Semrad, faculty for this educational event, has no relevant financial relationship(s) with ineligible companies to disclose.



Moderator:
Dejan Micic, MD
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Small Bowel Bleeding

Carol E. Semrad, MD, FACG
Professor of Medicine
Director, Small Bowel Disease and Nutrition

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Small Bowel Bleeding

- 5% of GI bleeders
- Most difficult and costly bleeders

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Small Bowel Bleeding
Outline

- Terminology
- Small Bowel Endoscopic and Imaging Modalities
- Making a Diagnosis/Therapy

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Terminology

Suspected Small Bowel Bleeding	Obscure GIB (NEW Definition)
• No source found at upper/lower endoscopy • Blood in terminal ileum Micic et al. Plos One 2019;20:1-10	• No source after comprehensive endoscopic and radiologic evaluation of the GI tract

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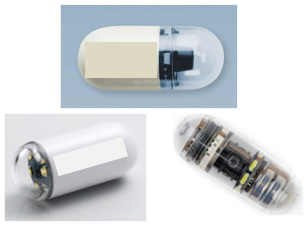
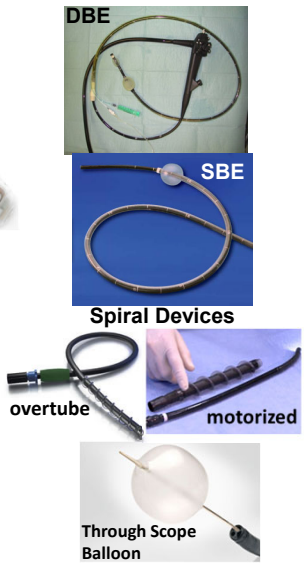
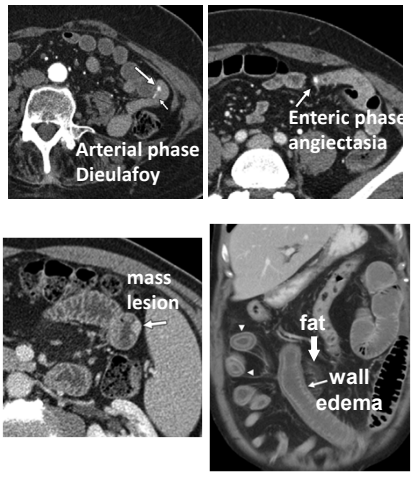
Wireless Capsules 1998



Device-Assist Enteroscopy allows therapy 2003



Multiphase CT Enterography 2011



Huprich et al. Radiology 2011;260:744 Huprich et al. AJR 2013;201:65

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Small Bowel Bleeding Imaging Modalities

Test	Diagnostic Yield
Small Bowel Barium	5%
Push Enteroscopy	30%
Multi-Phase CT Enterography	48%
Capsule Endoscopy	38-83%
Device-Assist Enteroscopy	51-80%
Intraoperative Enteroscopy	75-90%

Triester et al. Am J Gastroenterol 2005;100:2407
Huprich et al. Radiology 2011:260:744
Gerson et al. ACG Clinical Guideline, Am J Gastroenterol 2015;110:1265

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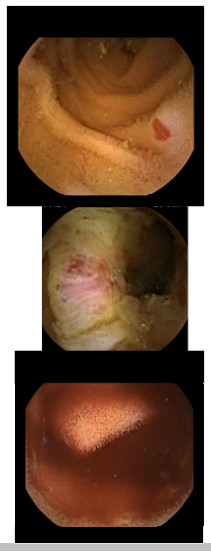
Small Bowel Capsule Endoscopy What is it good for?

- Flat mucosal lesions
- Yield highest
  - When performed within first 24-72 hrs in overt bleeding[1]
- Guides therapeutic approach
  - Lesion < 60% SB transit time, upper DAE approach[2]
- Yield of repeat capsule ~ 40% when[3]
  - Change from occult to overt bleed
  - Hemoglobin drop > 4 g/dl



[1]Rondonotti et al. ESGE guidelines. Endoscopy 2018;50:423.
[2]Li et al. Endoscopy 2009;41:762
[3]Viazis et al. Gastrointest Endosc 2009;69:850

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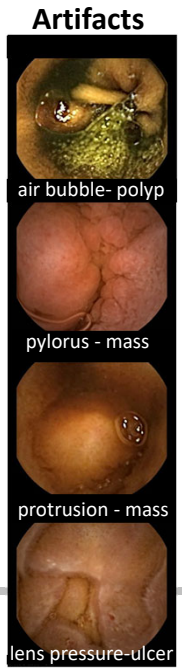
Small Bowel Capsule Endoscopy Limitations

- No sampling, therapy
- Reliability
  - 30% false positive reads
  - 20% incomplete studies
  - 18% missed mass lesions
  - May miss jejunal/Meckel diverticulum
- Capsule retention in SB
  - CTE or patency capsule in high risk pt



Gerson et al. Am J Gastroenterol 2015;110:1265

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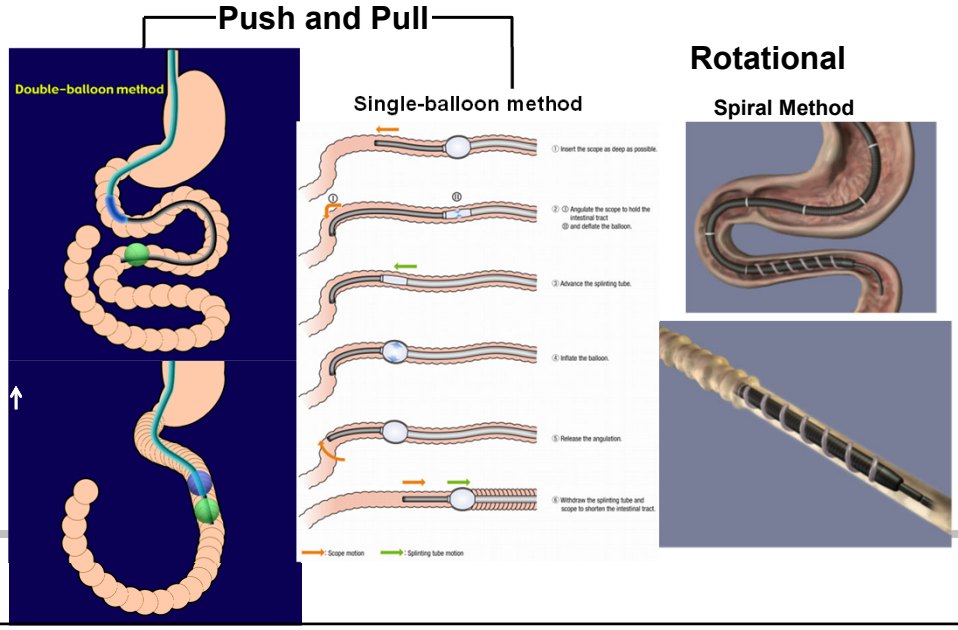
Device-Assist Enteroscopy



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Comparison of Enteroscopy Devices
Double vs. Single Balloon vs. Spiral

- Diagnostic yields similar 50-80%
- Summary of small studies
  - DBE – deepest insertion
  - SBE – easiest set-up
  - Spiral – fastest
- Complications similar
  - Perforation, pancreatitis (0.3%)
- All get deeper than push enteroscopy
  - 80 cm vs 230 cm depth
  - 44% vs 62% diagnostic yield

May et al. Am J Gastro 2006;101:2015
May et al. Am J Gastro 2010;105:575
Morgan et al. Gastro Endosc 2010;72:992
Domagk. Endoscopy 2011;43:472
Takano. Gastro Endosc 2011;73:734
Messer. Gastro Endosc 2013;77:241

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Device-Assist Enteroscopy

Advantages

- Allows therapy
- Best yield when performed within 24-72 hrs of overt bleed[1,2]
- Sampling, lesion marking
  - Minimally invasive surgery
- Best modality for Meckel diverticulum
  - 40% false negative, adult Meckel scans

Limitations

- Labor intensive
- Steep Learning Curve
  - 150 cases to achieve total exam[3]
- Incomplete examinations

[1] Aniwan et al. Endosc Int Open 2014;2:E90-5
[2] Rodrigues et al. Eur J Gastroenterol Hepatol 2018;30:1304
[3] Gross, Stark. Gastrointest Endosc 2008;67:898

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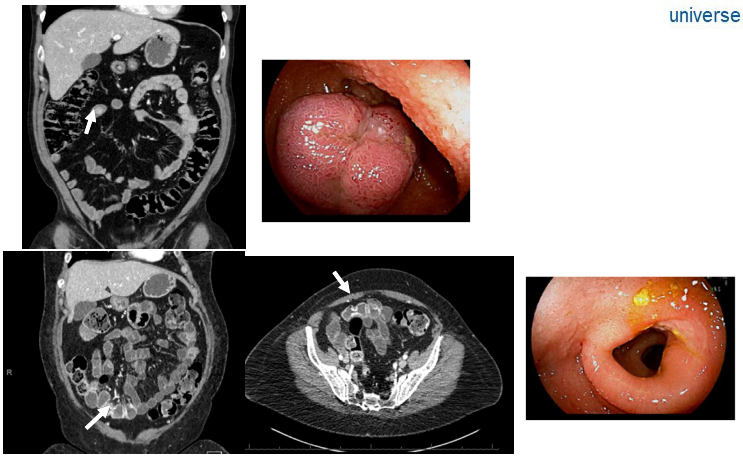
CT Enterography



Advantages

- Best at detecting
  - Mass lesion > 5mm size
  - Wall thickening, stenosis
- Localization, size

Disadvantages

- Poor for vascular lesions unless brisk bleed
- Limited ability for embolization in small bowel

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Suspected Small Bowel Bleeding

- Making a diagnosis
- What is the best initial test?

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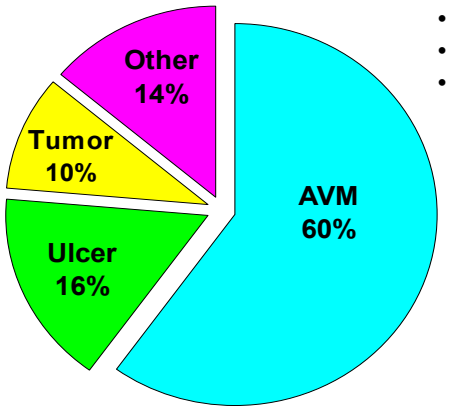
Causes of Small Bowel Bleeding

N=130



Other
- diverticulum
- strictures
- varices

DBE - U.S.A. multi-center study
Mehdizadeh et al. Gastrointest Endosc. 2006;64:740

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Small Bowel Bleeding

Age Guides Best Initial Test for Diagnosis

Young age (< 40 yrs)

- Ulcer (Crohn/NSAID)
- Tumor/polyp
- Meckel diverticulum
- Hereditary vascular lesions

Older age/Co-morbidities

- Vascular lesions
- NSAID injury

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Important Physical Findings

- Mucocutaneous telangiectasias
  - HHT
- Hyperpigmentation lip/skin
  - Peutz Jeghers Syndrome
- Skin hemangiomas
  - Blue Rubber Bleb Nevus Syndrome
- SEM of severe aortic stenosis
  - Anigoectasias, Heyde's Syndrome

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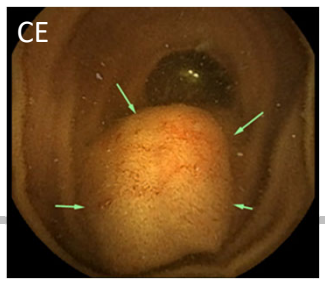
Case

- 26 y.o. woman, 35 wks pregnant
- History of unprovoked GI bleed (melena) 2 yrs ago
  - EGD, colonoscopy, CE, Meckel scan: All negative
  - Told to have CTA if she had recurrent bleeding
- Now with recurrent overt GI bleeding (melena)
- Transfused 8 Units PRBC
- ? Best test for diagnosis
  - 40% yield on repeat CE
  - CTE/MRE



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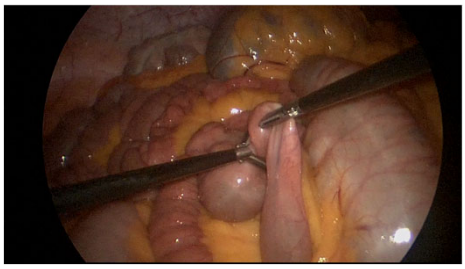
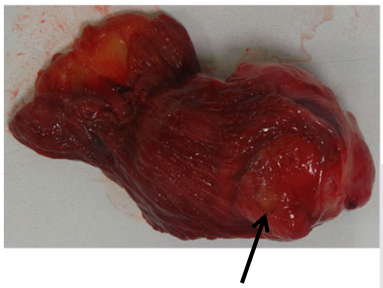
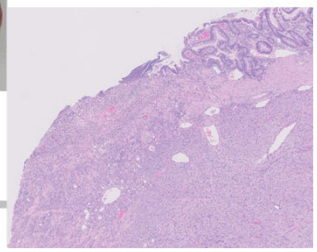
- Mother given steroid injections to mature fetal lung at 35 wks
- Admitted to hospital for induced delivery
- Standby for emergency C section and tumor resection if GI bleeding with delivery







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Lessons

- Beware unexplained overt GI bleeding in the young
- CE misses ~ 20% of small bowel mass lesions
- Retrospective review of her first CE showed debris in proximal SB
- Yield of repeat CE good when recurrent overt bleeding
- Consider CTE/MRE as the first test in young with overt bleeding

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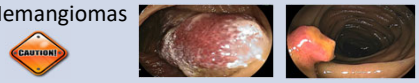
What is Safe to Remove in Small Bowel?

Lesion	Technique/Outcome
Polyps	Hexagonal snare if large, inject epinephrine to shrink Tattoo stalk, clip site ↑ bleeding risk with piecemeal resection
Foreign body	Retrieval net for capsules overtube as shield for sharps
Hemangiomas 	? size, depth If small size, polypectomy, APC, sclerosing agent using EUS
Submucosal mass	Perforations reported for polypectomy of carcinoid, lipoma

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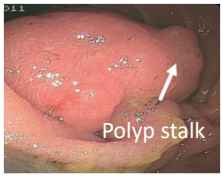
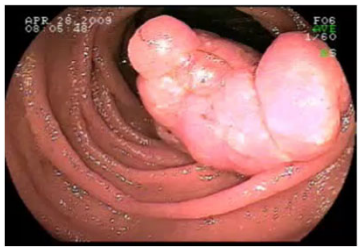
Treatment of Polyps – Hamartomas (PJS)

- Find polyp stalk
- Position polyp
- Use hexagonal snare
- If large polyp
  - Inject epinephrine 1:100,000, shrink head
  - Mark stalk with ink
  - Clip stalk after resection





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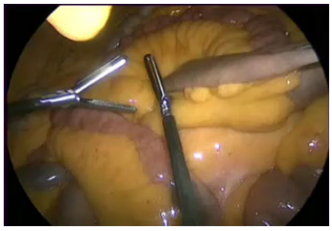
Lesion Marking, Laparoscopic Resection

- Indication
  - Subepithelial mass lesion
  - Ulcer/stenosis
- Device-assist Enteroscopy
  - Biopsy lesion
  - Tattoo at 2 sites
- Surgical resection
  - Intracorporeal (laparoscopic, internal)
  - Extracorporeal (open, mini-lap, external)



Tapaskar et al Abstract DDW 2018
Yeh et al. Surg Endosc 2009;23:739

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Small Bowel Vascular Lesions

- Acquired most common
  - Angioectasias
  - Dieulafoy lesion
- Hereditary hemorrhagic telangiectasia (HHT)
  - Autosomal dominant, 1:5,000 worldwide
  - Mutations disrupt TGF-β pathways in vascular endothelial cells
  - Epistaxis most common cause of bleeding/anemia
  - GI bleeding in 30%
  - AVMs liver, lung, brain
  - Juvenile polyposis-HHT with SMAD4 mutation[1]

[1]McDonald et al. Int J Colorectal Dis 2020;35:1963

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Angioectasia

- Most common cause of SB bleeding in elderly
- Upper SB most common site
- Overt or occult GI bleeding
- Risk factors
  - Aortic Stenosis (Heyde syndrome)
  - Von Willebrand disease
  - Chronic renal failure
  - Left Ventricular Assist Device (LVAD)
  - Smoking
- Most common finding on CE performed for OGIB in U.S.A.

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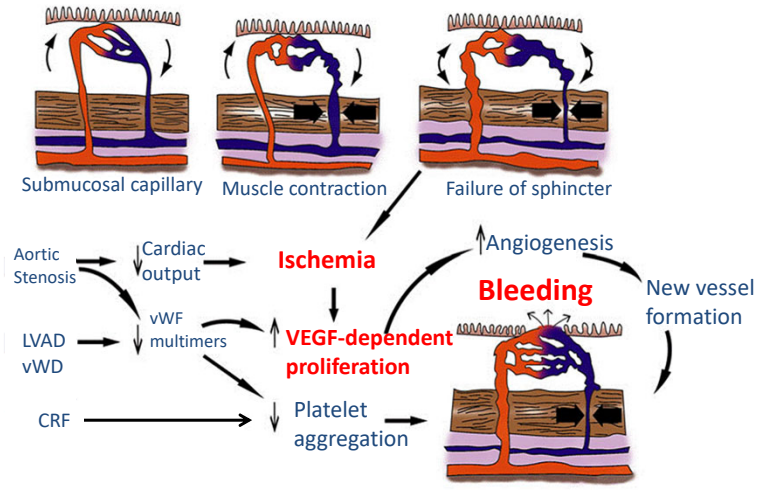

VEGF = Vascular Endothelial Growth Factor

Modified from Sami et al.
Aliment Pharmacol Ther 2014;39:15

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Diagnosis Small Bowel Vascular Lesions

- Capsule Endoscopy
  - Best test for flat lesions
  - Least invasive, best tolerated
  - Guides therapy
- Device-Assisted Enteroscopy
  - Invasive
  - Allows therapy
- Multiphase CT Enterography
  - Uncertain yield for vascular lesions
  - Embolization therapy in SB limited due to ischemia risk

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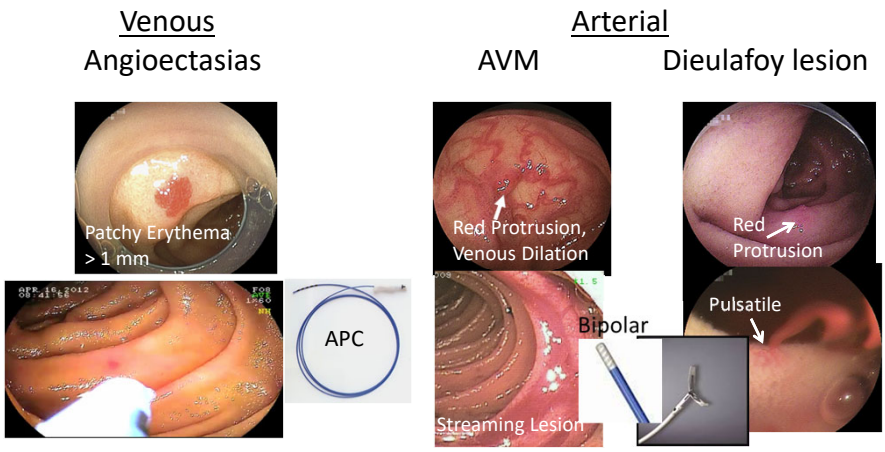
Endoscopic Classification Guides Therapy



Yano. Gastrointest Endosc 2008;67:169
Yano. Gastrointest Endosc 2016;83:809

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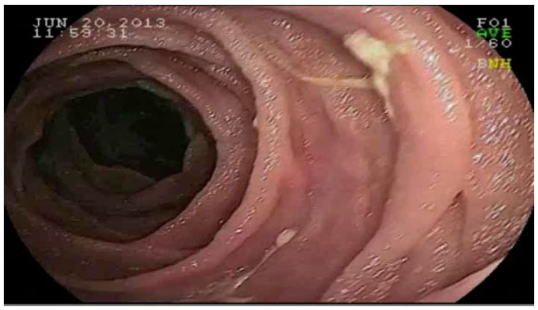
CASE

- 73 y.o. with CHF S/P LVAD on warfarin
- Recurrent overt bleeds
- Duodenal angioectasias treated in past
- Presents with melena, EGD negative
- VCE:
  - Red blood without underlying lesion
  - Starting at 17% of SB transit time



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Outcomes in Small Bowel Bleeding

Study DBE	Age yrs	Bleed type	Lesions	F/U mo	Rebleed
Sun[1], China N=119	42	overt > occult	AVM 30%	18	11%
Arakawa[2], Japan N=162	63	overt > occult	AVM 23%	18	7%
Gerson[3], USA N=135	68	overt = occult	AVM 43%	30	42%
May[4], Germany N=50	68	overt > occult	AVM 80%	55	41%

[1]Am J Gastroenterol 2006;101:2011
[2]Gastrointest Endosc 2009;69:866
[3]Clin Gastroenterol Hepatol 2009;7:66
[4]Endoscopy 2011;43:759

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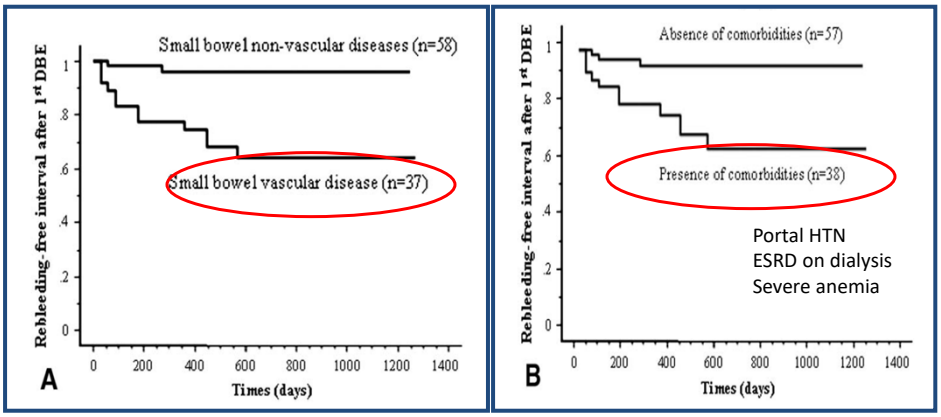
Which Patients Will Rebleed? Unrelated to NSAID/warfarin use



Arakawa et al. Gastrointest Endosc 2009;69:866

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Medical Therapy

Agent	Mechanism	Re-bleeding	Side Effects
Octreotide[1] Prospective studies	↓ splanchnic flow ↓ vascular resistance inhibits angiogenesis	decreased p <0.04	low
Thalidomide[2] PRT	inhibits angiogenesis	decreased p <0.001	high
Anti-VEGF[3]	inhibits VEGF	case reports in HHT	high

[1]Am J Gastroenterol 2007;102:254
[2]Gastroenterology 2011;141:1629
[3]Gastroenterol 2013:47:256

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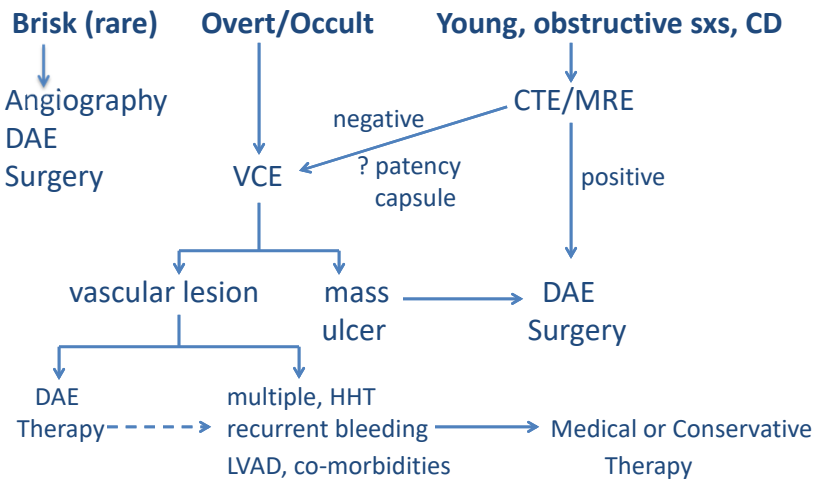
Suspected Small Bowel Bleeding



DAE = Device-Assist Enteroscopy
HHT = Hereditary hemorrhagic telangiectasia

Gerson ACG Clinical Guideline, Am J Gastroenterol 2015;110:1265

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Small Bowel Bleeding

Take Home Points

- Age, clinical presentation guides differential and best initial test for diagnosis
- In the young overt bleeder with a negative capsule study
  - Further assess for tumor (CTE/MRE) and Meckel diverticulum (DAE)
- CE and DAE have highest diagnostic yield
  - When performed within the first 2 weeks of overt bleeding
- Re-bleeding common after endoscopic therapy of vascular lesions
  - Second DAE for therapy may be of benefit
  - If co-morbidities, medical or conservative therapy (iron/transfusions)
  - If severe AS, fix valve
- Tattoo small bowel lesions to allow minimally invasive surgery

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Questions?

Speaker:
Carol E. Semrad, MD, FACG

Moderator:
Dejan Micic, MD

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