Radiologic Workup of Melena: Modalities for Diagnosis and Treatment

Suzana Zorca, HMS IV
Primary Care Radiology

9/20/2007
Outline

- Index patient P.C.: Presentation and ED workup
- Definition and differential diagnosis for melena.
- Menu of Tests: Pinpointing the source of bleeding.
- Comparative differential for our patient’s lesion.
- Conclusions: treatment and prognosis.
Patient P.C.: Presentation to MAH ED

HPI
- 62 year old man w/ recent lightheadedness and “large amount of black stool” x 2 in the past 24-48hrs.
- Morning of admission, went for a walk and became dizzy, mildly SOB, came to ED for evaluation.

PMH
- Depression, ?PUD, BPH.

PSH

Meds
- Motrin, ASA, wellbutrin, lorazepam.
Patient P.C.: ED Workup

**PE**
- VS T 98.4
- HR 92
- NSR BP113/69 RR 20
- O₂ 99%
- 2L NC.
- Gen: NAD, supine, anicteric, well appearing.
- Lungs: CTAB
- Abdomen: +BS, soft NT/ND, no masses or hernias. Guaiac (+)
- Ext: WWP, no edema.

**Labs**
- Lytes: 138/4.0/106/26/42/1.1

**Plan**
- 1L NS, 1 unit of pRBC.
- Upper endoscopy scheduled for PM.
- Q6H Hct checks: goal 32-35.
Melena: Definitions

Some simplifications:

- **Hematemesis**
  - vomiting of frank blood
  - indicates UGI source (above lig of Treitz).

- **Melena**
  - black (Gr: “melos” = black), “tarry”
  - indicates blood present in GI tract for ≥14h
  - usually a sign of UGI bleeding.

- **Hematochezia**
  - “Bright red blood per rectum”
  - passage of frank blood, or maroon stool
  - indicates LGIB

But…

- **Hematemesis**
  - Often not seen if bleed slow / chronic.
  - 16% pts w/UGIB have normal NGT aspirate.

- **Melena**
  - Depends on speed of transit / bleed volume
  - Slow R colonic bleeds can result in melena.

- **Hematochezia**
  - Depends on speed of transit / bleed volume.
  - Brisk UGIB may produce BRBPR.
Melena and occult GIB: Brief Differential

- **Tumor** (colonic carcinoma, gastric tumor, esophageal or small bowel cancers)
- **Trauma** (exposures: EtOH, NSAIDs, laxatives, erosives/toxic ingestion)
- **Infection/Inflammation** (gastritis, duodenitis, colitis, CD/UC, viral enteritis)
- **Infarction/Vascular** (PUD, angiodysplasia/vascular ectasia, Dieulafoy’s lesion)
- **Various others**: Meckel’s, Ingestions (**Licorice ice cream!**)
## Melena and occult GIB: Clinical Differential

| UGI Bleeding (UGIB) | PUD (55%)  
esophagogastric varices (14%)  
AVM (5%)  
gastric tumors/erosions (<4%)  
viral enteritis. |
|---------------------|-----------------|
| LGI bleeding (LGIB) | colonic tumor  
diverticulosis  
IBD (CD/UC)  
hemorrhoids |
| GI bleeding of Obscure Origin (OGIB) | Meckel’s diverticulum (<<1%)  
small bowel neoplasm (<1%)  
Dieulafoy’s lesion (1%)  
fistula (aorto-enteric)  
hemobilia |
Menu of Tests for Evaluating Melena

**EGD** = test of choice in patients with suspected UGI bleed.
Performed urgently if hemodynamic instability present.
1. detailed evaluation of mucosa down to duodenum.
2. venue for biopsy & treatment (banding, sclerotherapy, thermal probe, hemoclips, stents).

**Nuclear Medicine** = screens for ongoing occult bleeding.
1. $^{99m}$Tc-labeled red cells detect 0.1-0.4cc/min bleeds.
2. very low resolution, determines main vascular territory only.

**Angiography** = for clinically or NM-confirmed brisk ongoing bleeding.
1. 0.5-1cc/min bleeds detected.
2. Fine resolution can identify lesions w/abnormal vasculature (tumors, vascular ectasias).
3. Can cannulate individual arterial branches to embolize (or inject IA vasopressin).

**CT** = 1° imaging modality in stable patients with clinical suspicion for LGIB.
1. characterizes masses, identifies lymph node or solid organ metastases.
2. Detects inflammation, stones, and calcifications.
Menu of Tests (cont.)

**Video capsule endoscopy** = non-invasive alternative to repeat EGD or push enteroscopy.
1. Detailed imaging of mucosa along entire GI tract.

**Push enteroscopy** = alternative to VCE, with interventional/therapeutic options.
1. Long endoscope used to partially view jejunum, reaching 80-120cm beyond ligament of Treitz.
2. Detects 30-50% of obscure GIB.

**Fluoroscopy** = workup of melena in setting of dysphagia (evaluates lumen, not mucosa)
1. **SBFT** = good for stricture/tumor detection, but identifies only 5% of obscure GI bleeding.
2. **Enteroclysis** = similar to SBFT, but a mixture of Ba + methylcellulose is introduced via NGT directly into duodenum and leading edge of Ba is followed under fluoroscopy. Diagnostic yield for obscure GIB is 10%.
3. **Barium Swallow** = evaluates for esophageal pathology.
EGD showed small amount of old blood ("coffee-grounds") in fundus of stomach. No ulcer or malignancy.

Duodenum: Severe duodenitis without active bleeding or ulceration.

Recs: PPIx 1month, sucralfate, H&H monitoring. Repeat EGD vs. mesenteric arteriogram if bleeding persistent.

 Courtesy of Dr. A. Quaye, MAH Internal Medicine
Patient P.C.: Recap

62 year old man with minimal PMH now with symptomatic and worsening anemia and continued melenic BMs, requiring frequent transfusions.

Suspected UGI B of unknown source: ? small ulcer vs. small bowel tumor vs. Dielafoy’s lesion.

Hospital stay complicated by syncope HD 4
P.C.: Hospital course (cont.)

Hospital stay complicated by syncope HD 4

duodenitis: pronounced mucosal irritation

2nd portion of duodenum: still no active bleeding

Courtesy of Dr. A. Quaye, MAH Internal Medicine
Nuclear Medicine Scan: UGI bleeding

+NM scan → Patient is bleeding > 0.1ml/sec

Extravasation of contrast seen in LUQ
- may be colonic
- more likely small bowel (jejunum)
- correlation with CT does not help differentiate between these 2 options.

Next step: Angiography (SMA/IMA)
No active extravasation seen throughout the SMA territory, but because several blush areas (regions of plentiful contrast) were observed, several branches of the SMA were cannulated.

On the next slide, the positive result is shown: a jejunal branch revealed a hypervascular mass in the proximal jejunum, just distal to the ligament of Treitz, but no active extravasation of contrast.
Angiography revealed hypervascular mass (tumor blush) but no active extravasation in the proximal jejunum, just distal to the ligament of Treitz.

Pre-op CT Abdomen
To better define the location and characteristics of the lesion, and determine presence of metastases.
Abdominal CT (+/- Contrast) was obtained to better define the location and characteristics of the lesion, and to determine the presence of metastases in the liver and other abdominal sites.

A solitary small bowel mass was delineated, no metastases present.
Coronal reconstructions of abdominal CT slices helped localize the single small bowel lesion more precisely. Again, no metastases were seen in the liver and other abdominal viscera.

The solitary, smooth, rounded small bowel mass is again noted on coronal reconstruction.
## Single small bowel mass: A differential

<table>
<thead>
<tr>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Leiomyoma</td>
<td>• Adenocarcinoma</td>
</tr>
<tr>
<td>• Adenoma</td>
<td>• Lymphoma</td>
</tr>
<tr>
<td>• Lipoma</td>
<td>• Carcinoid</td>
</tr>
<tr>
<td>• Neurofibroma</td>
<td>• GIST/Leiomyosarcoma</td>
</tr>
<tr>
<td>• Hemangioma</td>
<td>• Metastases</td>
</tr>
</tbody>
</table>

---
Small Bowel Masses: CT Characteristics

**Burkitt’s lymphoma** in 30-year-old man w/ F/C and abdominal pain. Bulky mass seen encasing small bowel just beyond the ligament of Treitz (white arrow).

**Carcinoid tumor** in 79-year-old patient w/ flushing, FTT and abdominal pain. A calcified mass with a stellate pattern of soft tissue stranding (desmoplastic rxn).

**Leiomyoma** of the small bowel in a 51-year-old man with occult GI bleeding. CT demonstrates a smooth, lobulated mass (arrow) c/w leiomyoma.

**Lipoma** in a 60-year-old man w/ abdominal pain. CT shows a well-circumscribed ovoid mass with fat attenuation (arrow), the classic appearance of a lipoma.

Companion Patient #1: Annular constricting adenocarcinoma

Apple-core lesion in distal duodenum/proximal jejunum, around ligament of Treitz, 2º to annular constricting carcinoma, with characteristic overhanging edges proximally & distally.
Companion Patient #2: Adenocarcinoma

77 year old woman with 12lbs weight loss, melena, and obstructive symptoms.
Patient had known gastritis, and had an abnormality on fluoroscopic UGI evaluation.
Back to our patient: the solitary jejunal mass has CT characteristics c/w GIST.

Surgery planned to attempt complete resection of this jejunal tumor.
Resection of jejunal mass performed 9/05/07 (HD 5).

- Bleeding necrotic center, luminal side
- Exophytic portion, mesenteric view

Courtesy of Dr. G. Govin, MAH Pathology Department
Micro Pathology

- GIST confirmed: c-kit positive, desmin and s-100 negative.
- Negative resection margins.
- However, histology not completely correlated to disease behavior!

Courtesy of Dr. G. Govin, MAH Pathology Department
Summary: Hospital Course

- P.C. discharged home on 9/11/07 in good condition.
- Symptomatic follow-up as well as survey CT scan in 3-6 mos.

Follow-up considerations:
- Gleevec
- PET-CT
Acknowledgements…

- Gillian Lieberman, MD
- J. Pierre Sasson, MD
- Nyca Bowen
- Amy Oliveira, MD
- Christine Cooley, MD
- Neel Madan, MD
- Gregory Gauvin, MD
- Larry Barbaras, Webmaster

Many thanks!
References

- Hong X, et al. Radiographics 2006. Teaching Points for Gastrointestinal Stromal Tumors: Role of CT in Diagnosis and in Response Evaluation and surveillance after treatment with Imatinib.
- Kim, JH et al. Radiographics 2006. Imaging of various gastric lesions with 2D MPR and CT Gastrography performed with Multidetector CT
😊 Bonus Image: Companion Pt KUB