69-year-old male with hematochezia and diarrhea

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Patient Presentation

• **HPI:** Patient presented to the ED with new-onset hematochezia. He had diarrhea for around 3 months and mild upper abdominal pain for a week prior to presenting.

• **PMHx:** prior MI, pacemaker, hyperlipidemia, HTN, sleep apnea
• **Surg Hx:** coronary stents, colon polyp removal
• **Medications:** aspirin, atorvastatin, lisinopril, metoprolol, citalopram
Patient Presentation

- **Vitals:** BP 149/77, HR 80, RR 18, 36.4° C, SpO2 98%
- **PE:** DRE heme positive, otherwise unremarkable
- **Labs**
  - Hgb - 18.3 (H)
  - Na - 133 (L)
  - Lipase - 175 (H)
  - Glucose - 152 (H)
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
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<tbody>
<tr>
<td>CTA abdomen and pelvis without and with IV contrast</td>
<td>Usually Appropriate</td>
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<tr>
<td>Diagnostic/therapeutic colonoscopy</td>
<td>Usually Appropriate</td>
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<tr>
<td>RBC scan abdomen and pelvis</td>
<td>Usually Appropriate</td>
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<tr>
<td>Transcatheter arteriography/embolization</td>
<td>May Be Appropriate</td>
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<tr>
<td>MRA abdomen and pelvis without and with IV contrast</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>Surgery</td>
<td>Usually Not Appropriate</td>
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</tbody>
</table>

This imaging modality was ordered
Findings (unlabeled)
Findings (labeled)

- Tethering of small bowel loops toward mesenteric mass
- Spiculated 3.4 x 2.3 cm mesenteric mass with calcifications
- 6.9 x 6.8 cm heterogeneous hepatic lesion
Findings (unlabeled)
Findings (labeled)

Multiple liver lesions

“Spoke-like” appearance due to desmoplastic reaction
Ga-68 Dotate PET-CT shows liver lesions with intense gallium uptake and possibly central necrosis.
Malignant Small Intestinal Neuroendocrine (Carcinoid) Tumor with Liver Metastases

Based on surgical pathology and liver biopsy obtained soon after presentation
Neuroendocrine (Carcinoid) Tumor

• Pathology
  • Well-differentiated tumor arising from amine precursor uptake and decarboxylation (APUD) cells
  • May secrete hormones – serotonin, histamine, gastrin

• Epidemiology
  • Most commonly arises in small intestines – incidence 1.05 per 100,000
    • Appendix and lungs are other common sites

• Clinical Features
  • Nonspecific – diarrhea, abdominal pain, fatigue, weight loss
  • Small bowel obstruction, hematochezia
  • Carcinoid syndrome – diarrhea, flushing, bronchospasm, right heart disease
    • Occurs in < 10% of cases and only if liver metastasis present
    • Due to increased circulating serotonin
Case Discussion

• Diagnosis
  • Biochemical workup – urine and plasma 5-HIAA, tumor markers (chromogranin A, synaptophysin, serotonin)
  • CT, MRI, nuclear medicine studies
    • PET-CT Ga-68 Dotatate scan to detect distant metastases
    • Somatostatin receptor scintigraphy with radiolabeled octreotide
  • Endoscopy and biopsy

• Radiologic features
  • Primary lesion often spiculated, polypoid, hyperenhancing
    • Calcifications present in 70%
  • Bowel kinking, tethering, obstruction due to desmoplastic reaction and fibrosis caused by serotonin
  • Liver metastases strongly enhance in arterial phase
    • Isoenhancing or hypoenhancing to liver in delayed phase
Case Discussion

• **Treatment**
  • Surgical resection of tumor and lymph nodes if possible
  • Somatostatin analogs (octreotide, lanreotide)
  • Hepatic artery embolization for liver metastases
  • Chemotherapy, radiotherapy, targeted therapy

• **Prognosis**
  • 5-year survival rate is 67% when metastatic
    • > 90% if not metastatic
References


- Chan JA, Kulke M. Metastatic well-differentiated gastrointestinal neuroendocrine (carcinoid) tumors: Systemic therapy options to control tumor growth. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA.


- Strosberg JR. Diagnosis of carcinoid syndrome and tumor localization. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA.