Diagnosis and Endovascular Treatment of Chronic Mesenteric Ischemia

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Disclosures

I have no relevant financial relationships.
Chronic Mesenteric Ischemia

• Due to decreased perfusion to visceral organs, especially intestine
Clinical Presentations

• Triad of visceral ischemia

  1. Postprandial abdominal pain
     • Epigastric or periumbilical
  2. Fear of eating
  3. Weight loss

• Patients may not have all 3 presentations
Clinical Presentations

• Triad of visceral ischemia

1. Postprandial abdominal pain
   • Epigastric or periumbilical
2. Fear of eating
3. Weight loss

• Patients may not have all 3 presentations
• High index of suspicion
Diagnosis

- **Duplex US**
  - **Criteria >70% stenosis**
  - Fasting
  - SMA: PSV > 275
    - EDV > 45
  - Celiac A: PSV > 200
    - EDV > 55
Diagnosis

- **CTA** or **MRA**
  - Choice of imaging study
  - Direct evidence of visceral artery disease
  - Evidence of bowel infarction
  - Associated pathology
Diagnosis

- **Angiography**
  - Diagnostic and therapeutic
  - Invasive
  - Procedure related complications
  - Contrast related complications
Diagnosis

• Angiography
  • Diagnostic and therapeutic
  • Invasive
  • Procedure related complications
  • Contrast related complications
Endovascular Treatment

PTA of SMA first reported in 1980
Open versus endovascular revascularization for chronic mesenteric ischemia: Risk-stratified outcomes

Gustavo S. Oderich, MD, Thomas C. Bower, MD, Timothy M. Sullivan, MD, Haraldur Bjarnason, MD

**Primary Patency**

- OR 88 ± 3%
- ER 41 ± 9%
- P < .00001

**Secondary Patency**

- OR 97 ± 2%
- ER 88 ± 4%
- P < .005

**Conclusion:** OR has similar mortality but higher morbidity and longer hospitalization than ER in low-risk or high-risk patients with CMI. Both treatments effectively improved symptoms, but restenosis, recurrent symptoms, and reinterventions were more likely in ER patients. These findings may guide treatment selection and counseling of low-risk and high-risk CMI patients undergoing OR or ER procedures. (J Vasc Surg 2009;49:1472-9.)
<table>
<thead>
<tr>
<th>Variable</th>
<th>PTSA/S</th>
<th>Surgery</th>
<th>P&lt;sup&gt;b&lt;/sup&gt;</th>
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<th>Surgery</th>
<th>P&lt;sup&gt;b&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>Patients, No. (%)</td>
<td>3455 (61.9)</td>
<td>2128 (38.1)</td>
<td>...</td>
<td>1857 (35.5)</td>
<td>3380 (64.5)</td>
<td>...</td>
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<td>Age, median (range), y</td>
<td>74 (24-97)</td>
<td>68 (29-99)</td>
<td>&lt;.001</td>
<td>72 (26-96)</td>
<td>72 (21-99)</td>
<td>.53</td>
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<tr>
<td>&lt;60, %</td>
<td>15</td>
<td>32</td>
<td>&lt;.001</td>
<td>24</td>
<td>26</td>
<td>.84</td>
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<tr>
<td>60-69, %</td>
<td>23</td>
<td>28</td>
<td>&lt;.05</td>
<td>25</td>
<td>22</td>
<td>.36</td>
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<tr>
<td>70-79, %</td>
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<td>30</td>
<td>&lt;.01</td>
<td>31</td>
<td>33</td>
<td>.62</td>
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<tr>
<td>≥80, %</td>
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<td>11</td>
<td>&lt;.001</td>
<td>21</td>
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<td>.52</td>
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<td>Female, %</td>
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<td>79</td>
<td>&lt;.05</td>
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<td>66</td>
<td>.14</td>
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<td>Comorbidities, %</td>
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<td>Hypertension</td>
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<td>51</td>
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<td>56</td>
<td>46</td>
<td>&lt;.01</td>
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<tr>
<td>PVD</td>
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<td>32</td>
<td>&lt;.01</td>
<td>33</td>
<td>13</td>
<td>&lt;.001</td>
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<tr>
<td>CAD</td>
<td>39</td>
<td>26</td>
<td>&lt;.001</td>
<td>34</td>
<td>19</td>
<td>&lt;.001</td>
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<tr>
<td>Afib/flutter</td>
<td>16.5</td>
<td>14.9</td>
<td>.49</td>
<td>23.6</td>
<td>38.7</td>
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<td>Prior MI</td>
<td>8.3</td>
<td>6.0</td>
<td>.17</td>
<td>6.4</td>
<td>4.7</td>
<td>.23</td>
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<td>CHF</td>
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<td>Diabetes mellitus</td>
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<td>12</td>
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<td>COPD</td>
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<td>27</td>
<td>.06</td>
<td>29</td>
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<td>.06</td>
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<td>Chronic renal disease</td>
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<td>9.8</td>
<td>3.5</td>
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<tr>
<td>CVD</td>
<td>6.9</td>
<td>7.7</td>
<td>.61</td>
<td>4.7</td>
<td>5.9</td>
<td>.41</td>
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<td>Charlson, mean ± SD</td>
<td>1.3 ± 1.1</td>
<td>1.0 ± 1.0</td>
<td>&lt;.001</td>
<td>1.4 ± 1.3</td>
<td>0.9 ± 1.1</td>
<td>&lt;.001</td>
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<td>Bowel resection, %</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>28.1</td>
<td>47.8</td>
<td>&lt;.001</td>
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Afib, Atrial fibrillation; CAD, coronary artery disease; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; CVD, cerebrovascular disease; MI, myocardial infarction; PTSA/S, percutaneous transluminal angioplasty, with or without stenting; PVD, peripheral vascular disease; SD, standard deviation.

<sup>b</sup>Surgery includes bypass, endarterectomy, or embolectomy.
<sup>c</sup>Statistical significance set at P < .01.
Endovascular Treatment

- When to intervene
- How many vessels need to be treated
- Access
- Crossing the lesions
- PTA vs. Stenting
- Post-stenting medical management
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Endovascular Treatment

Indications

• High grade mesenteric artery stenosis or total occlusion
  • Symptomatic
  • Asymptomatic
  >2-vessel significant disease
    • Without revascularization, >30% will develop bowel infarct in 2-3 years
Endovascular Treatment

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Endovascular Treatment

• Revascularization
  • Reportedly 1.4-1.8 vessels

• Single-Vessel revascularization
  • Adequate to relieve symptoms in most of patients

• Two-vessel revascularization
  • Lower risk of symptom recurrence and secondary re-intervention
  • Progressive or inflammatory disease
Endovascular Treatment

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Endovascular Treatment

• Access
  • Brachial
  • Femoral
Endovascular Treatment

• Lateral views
  • Confirm diagnosis

• Anterior-posterior views
  • Collaterals
Endovascular Treatment

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Endovascular Treatment

- Lateral view
  - Roadmap if needed
- Brachial access if sharp angle
- Angle sheath and catheter
- Crossing catheter
- CTO devices
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Endovascular Treatment

- **Pre-dilatation**: 3-4 mm balloon before stenting
- **Embolization protection device (EPD)**
  - May need if 3-vessel disease and SMA is the only vessel treatable
Endovascular Treatment

- Prefer to use stiff or super-still wire
- Balloon angioplasty (PTA) alone
  - 15%
- Primary stenting
  - 85%
  - Lower recoil and re-intervention
  - Balloon expendable stent
    - Accurate
    - May post-dilate to a larger size needed
- May need covered stent if instent stenosis
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Post-procedure medications

- Plavix: 6 months
- ASA: lifetime
Indications for endovascular treatment of CMI

- Symptomatic
- Asymptomatic with 2 vessel significant disease

One vessel PTA/Stenting is adequate

- Two-vessel treatment has better long-term outcomes

Primary stenting is recommended

Balloon expendable stent is preferred

Post-stenting antiplatelet

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- ASA life time
In Summary

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