Non-Variceal GI Bleeding: Interventional Radiology

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Surgery Grand Rounds
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GI Bleeding

- **Upper GI Bleeding:**
  - 50-150 per 100,000 in US each year
  - 300,000 US hospital admissions each year

- **Lower GI Bleeding:**
  - 20 per 100,000 in US each year
GI Bleeding

- Mortality 10-35%
- Age and comorbidities are independent risk factors for mortality
Upper GI Bleeding

- Sources:
  - Peptic Ulcer
  - Tumors
  - Ischemia
  - Gastritis
  - AVMs
  - Dieulafoy’s lesions
  - Mallory-Weiss tears
  - Trauma
  - Iatrogenic
Lower GI Bleeding

Sources:
- Diverticulosis (40%)
- Angiodysplasia (AVM)
- Colon Cancer
- Hemorrhoids
- Inflammatory Bowel Disease
- Ischemic Conditions
  - Colitis, volvulus
Treatment

- Resuscitation
- Emergent Endoscopy
  - EGD
  - Colonoscopy if prep clears stool
- Angiography – less invasive
- Surgery
Treatment

- When endoscopy fails to control bleeding?
- Locate Bleeding site
  - RBC Scintigraphy
- Angiography – less invasive
  - GOLD STANDARD for diagnosis
  - Must have active bleeding (0.5-1.0 ml/min)
  - Also can be therapeutic
    - Vasopressin infusion
    - Embolization (Gelfoam, coils, alcohol particles)
Treatment

- No prospective randomized trials that compare IR embolization to surgery.
- Several retrospective case series show that IR embolization can be successful in treating GI bleeding.
- IR embolization can reduce the need for surgery, especially in the high risk patients.
UGI Bleeding

- Endoscopy
- PPIs
- H. pylori treatment
- Suited to IR Embolization therapy
  - Collaterals
  - Less ischemic complications
  - 85% of UGI bleeding from Left Gastric Artery
UGI Bleeding
UGI Bleeding

- 2 retrospective case series
  - University of Pennsylvania
  - Canada

- Retrospective review comparing IR embolization and surgery in bleeding PUD
UGI Bleeding – U. of Penn

- Retrospective review of 178 patients with non-variceal UGI bleeding who underwent IR embolization from 1988-2000
- Evaluated 163 with complete records
- Compared mortality rates of clinically successful (cessation of bleeding) and unsuccessful embolization

Schenker et al
If no active extravazation was seen, emperic embolization was performed
- Left gastric artery for gastric bleeding
- Gastroduodenal artery for duodenal bleeding

Evaluated subgroups of patients with MOF and coagulopathy at the time of embolization

Schenker et al
## UGI Bleeding – U. of Penn

<table>
<thead>
<tr>
<th></th>
<th>Successful Embolization</th>
<th>Unsuccessful Embolization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n=163</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>95 (58%)</td>
<td>68 (42%)</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>10 (11%)</td>
<td>44 (68%)</td>
</tr>
<tr>
<td><strong>54 (33%)</strong></td>
<td></td>
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<tr>
<td><strong>MOF</strong></td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td><strong>38 (23% of pts)</strong></td>
<td>(69% mortality 9/13)</td>
<td>(96% mortality 24/25)</td>
</tr>
</tbody>
</table>

Schenker et al
93 (57%) of patients had coagulopathy
- 2.8 times more likely to fail embolization
- 3.4 times more likely to die

Complications:
- 17 (10%)
- 5 were major (unstable coils in splenic branches, embolization of rt hepatic artery, dissection of SMA, 2 ARF)
Conclusion:

- Successful IR embolization decreased mortality in UGI bleeding, even in the setting of MOF or coagulopathy.

- IR embolization should be considered the first line approach for managing non-variceal UGI bleeding refractory to endoscopic control.

Schenker et al
75 Consecutive patients form a tertiary hospital in Canada from 1988-1998 with non-variceal UGI bleeding that failed endoscopic treatment

- 57 (76%) primarily successful
- 5 more had secondary success within 12 days (83% overall success)
- Overall, only 12 (16%) needed surgical intervention

Ania et al
Conclusion:

- IR embolization is an effective treatment of non-variceal UGI bleeding and may reduce the need for surgery.
- Repeat embolization can be attempted in cases of bleeding recurrence.

Ania et al
UGI Bleeding – Peptic Ulcers

- Retrospective review of 1,350 patients with bleeding ulcer
- 85 (6.2%) required further therapy due to uncontrolled bleeding or re-bleeding
- Evaluated 70 with complete records
  - IR Embolization – 31
    - Older, with higher incidence of cardiac disease and anticoagulant therapy
  - Surgery – 39

Ripoll et al.
<table>
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<tr>
<th>Outcome</th>
<th>IR Embolization</th>
<th>Surgery</th>
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<tr>
<td></td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>Mean pRBC Units</td>
<td>4.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Recurrence of Bleeding</td>
<td>9 (29%)</td>
<td>9 (23%)</td>
</tr>
<tr>
<td>Surgery</td>
<td>5 (16%)</td>
<td>12 (30%)</td>
</tr>
<tr>
<td>Death</td>
<td>8 (26%)</td>
<td>8 (21%)</td>
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Ripoll et al
UGI Bleeding – Peptic Ulcers

- Surgery after initial treatment
  - IR:
    - 4 due to recurrent bleeding
    - 1 due to perforation
  - Surgery:
    - 5 due to recurrent bleeding
    - 7 due to surgical complications

No technical complications or ischemic events in the IR Embolization group.

Ripoll et al
Conclusion
- No difference in the outcomes of bleeding recurrence, transfusion requirements, surgery or death
- IR group was higher risk

Ripoll et al
LGI Bleeding

- Colonoscopy limited due to active hemorrhage obscuring bleeding point
- Surgery has high mortality of 10-35%
- IR embolization
  - Less collateral blood supply
  - Higher ischemic complications
LGI Bleeding

- Colonoscopy limited due to active hemorrhage obscuring bleeding point
- Surgery has high mortality of 10-35%
- IR embolization
  - Less collateral blood supply
  - Higher ischemic complications
- Superselective catheterization
  - Distal arteries smaller than 1 mm in diameter
  - Less ischemic complications
LGI Bleeding
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LGI Bleeding

- 2 case series of superselective IR embolization
- Review of multiple case series of IR embolization for LGI Bleeding
LGI Bleeding – U of Rochester

- Retrospective review of 22 patients undergoing superselective embolization of LGI bleeding from 1992-2002
- Colonoscopy performed in only 3 patients prior to angiography
- Mean transfusion requirement was 6.8 units pRBCs
- INR corrected to <1.3 when needed

Kuo et al
## LGI Bleeding – U of Rochester

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<td><strong>Bleeding recurrence</strong></td>
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<td><strong>Need for Surgery</strong></td>
<td>3 (14%)</td>
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<tr>
<td><strong>Bowel infarction</strong></td>
<td>0</td>
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<tr>
<td><strong>Minor ischemia</strong></td>
<td>1 (4.5%)</td>
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Kuo et al
Conclusions:

- Modern superselective IR embolization is a safe and effective treatment for LGI Bleeding.
- Superselective IR embolization should be attempted when LGI bleeding is detected by angiography.

Kuo et al.
LGI Bleeding - Hartford

- Retrospective review of 27 patients undergoing superselective embolization of LGI bleeding from 1993-1999
- Colonoscopy performed in 6 patients prior to angiography (5 negative, 1 not control bleeding)
- Mean transfusion requirement was 2.4 units pRBCs
- All had follow-up colonoscopy at 1 year to evaluate for ischemia

DeBarros et al
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DeBarros et al
LGI Bleeding - Hartford

Conclusions:

- Superselective IR embolization is a safe and effective treatment for LGI Bleeding.
- When angiographic location of LGI Bleeding is possible, superselective IR embolization should be considered as the primary therapeutic alternative.

DeBarros et al
LGI Bleeding - Review

- Retrospective review of 10 patients undergoing IR embolization of LGI bleeding from 1998-2000 at University Hospitals of Cleveland
- Reviewed their results and 7 additional previous LGI bleeding embolization case series

Gady et al
## LGI Bleeding - Review

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Gady et al
Conclusions:

- IR embolization is a safe and effective treatment for LGI Bleeding.
- IR embolization hemostasis, even when temporary, allows for semi-elective staging of operative resection.
- All patients with an angiographically demonstrable lesion should undergo embolization, with bowel prep and colonoscopy within 48 hrs to confirm diagnosis and evaluate for mucosal ischemia.

Gady et al
Conclusion

- IR embolization should be considered in all patients with non-variceal GI bleeding that cannot be controlled endoscopically.
- Superselective IR embolization should can be done safely in LGI Bleeding.
- The decision to proceed with IR embolization should be made with the consultation of a surgeon.
Conclusion

- It is important to evaluate patients for post-embolization ischemia by clinical signs or endoscopic evaluation.
- IR embolization only treats the symptom of bleeding and not the underlying disease.
References: