Endoscopy Conference

Nonvariceal Upper Gastrointestinal Bleeding

Henry Hefler
Upper gastrointestinal bleeding

• Blood loss having an origin proximal to the suspensory muscle of the duodenum (ligament of Treitz)

• Can manifest as:
  – Hematemesis
  – “Coffee ground” emesis
  – Return of red blood via NG tube
  – Melena
  – Hematochezia (extremely brisk)

• Mortality remains 5-14%
Table 12.5  American Society of Gastrointestinal Endoscopy Bleeding Survey: Endoscopic Diagnosis for Upper Gastrointestinal Bleeding in 2225 Patients

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency (%)</th>
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<tbody>
<tr>
<td>Duodenal ulcer</td>
<td>24.3</td>
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<td>Varices</td>
<td>10.3</td>
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<tr>
<td>Mallory-Weiss tear</td>
<td>7.2</td>
</tr>
<tr>
<td>Esophagitis</td>
<td>6.3</td>
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<tr>
<td>Erosive duodenitis</td>
<td>5.8</td>
</tr>
<tr>
<td>Neoplasm</td>
<td>2.9</td>
</tr>
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<td>Stomal ulcer</td>
<td>1.8</td>
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Timing of Endoscopy

• Patients with UGIB should generally undergo endoscopy within 24 hrs of admission, following resuscitative efforts to optimize hemodynamic parameters and other medical problems.

• In patients with higher risk clinical features (e.g., tachycardia, hypotension, bloody emesis or NG aspirate in hospital) endoscopy within 12 hrs may be considered to potentially improve clinical outcomes.
Risk Assessment

- Risk assessment should be performed to stratify patients into higher and lower risk categories, and may assist in initial decisions such as timing of endoscopy, time of discharge, and level of care
Risk Assessment

• Two commonly used risk stratification scores:
  – Blatchford and Rockall

  • Blatchford score performed better than the Clinical Rockall score for predicting patients at high risk for clinical intervention
    – In a retrospective analysis of 354 patients, the Blatchford score identified 92.1% and the Rockall score identified 70.1% of the high risk patients

Risk Assessment

• Discharge from the emergency department without inpatient endoscopy may be considered in patients with urea nitrogen < 18.2 mg/dl; hemoglobin ≥ 13.0 g/dl for men (12.0 g/dl for women), systolic blood pressure ≥ 110 mm Hg; pulse < 100 beats/min; and absence of melena, syncope, cardiac failure, and liver disease, as they have < 1 % chance of requiring intervention
Endoscopic Treatment Modalities

• Injection
  – NS, dilute epinephrine (1:10,000 or 1:20,000 in saline), sclerosants (ethanol, ethanolamine, polidocanol), cyanoacrylate glues
    • Primary mechanism of action is tamponade resulting from volume effect; some agents have a secondary pharmacologic effect
    • Typically administered in 4 quadrants
Endoscopic Treatment Modalities

• Injection – cont
  – **Epinephrine**: 0.5 – 2 ml aliquots in and around the stigmata of hemorrhage
  – **Absolute alcohol**: 0.1 – 0.2 ml aliquots with a limitation of 1 – 2 ml due to the concern for tissue injury with higher volumes
  – **Five percent ethanolamine**: 0.5 – 1.0 ml aliquots; widely variable total volumes of 0.5 – 14 ml have been reported
Endoscopic Treatment Modalities

• Thermal Therapy
  – Electrocautery probes (monopolar or bipolar), heater probes
    • Tamponade combined with heat or electrical current to coagulate blood vessels (coaptation)
    • Performed with the endoscope tip as close as possible to the hemorrhage
      – Bipolar electrocautery typically has a setting of ~ 15 W and 8 – 10 second applications are recommended
      – Heater probe typically has a setting of 30 J being used

• Multiple applications should be applied until bleeding has stopped, the vessel is flattened, and the base is whitened
Endoscopic Treatment Modalities

• Thermal Therapy – cont
  – APC
    • Ionized gas conducts electricity resulting in coagulation of superficial tissues
    • Typically applied with power of 20W with a flow rate of 0.5L/min
Endoscopic Treatment Modalities

• Mechanical Therapy
  – Clips, Band devices
    • Tamponade
    • Typically placed over the bleeding site and on either side of the SRH in an attempt to seal the underlying artery
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Peptic Ulcer Disease

- **Stigmata of recent hemorrhage** should be recorded as they predict risk of further bleeding and guide management decisions.

**FORREST CLASSIFICATION**

<table>
<thead>
<tr>
<th>I : Active bleeding</th>
<th>II : Stigmata of recent haemorrhage</th>
<th>III: Lesions without active bleeding (No signs of recent haemorrhage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I a: Arterial, Spurting haemorrhage</td>
<td>II a: Visible vessel</td>
<td></td>
</tr>
<tr>
<td>I b: Oozing haemorrhage</td>
<td>II b: Adherent clot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>II c: Dark base (haematin covered lesion)</td>
<td></td>
</tr>
</tbody>
</table>
## Forrest Classification

<table>
<thead>
<tr>
<th>Stigmata of Hemorrhage (Forrest Classification)</th>
<th>Active Spurting (Ia)</th>
<th>Active Oozing (Ib)</th>
<th>Visible Vessel (IIa)</th>
<th>Adherent Clot (IIb)</th>
<th>Flat Pigmente d Spot (IIc)</th>
<th>Clean Base (III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence</td>
<td>12%</td>
<td>8%</td>
<td>8%</td>
<td>16%</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>Risk of Rebleeding</td>
<td>55%</td>
<td>43%</td>
<td>22%</td>
<td>10%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Surgery for Bleeding</td>
<td>35%</td>
<td>34%</td>
<td>10%</td>
<td>6%</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>11%</td>
<td>11%</td>
<td>7%</td>
<td>3%</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>
Peptic Ulcer Disease
Endoscopic Therapy vs No Therapy

• Active Bleeding

  – Decreased **further bleeding**: NNT = 2
  – Decreased **need for surgery**: NNT = 2
  – Decreased **need for urgent intervention**: NNT = 2

  – No difference in mortality
Peptic Ulcer Disease
Endoscopic Therapy vs No Therapy

• Nonbleeding visible vessel
  – Decreased further bleeding: NNT = 5
  – Decreased need for surgery: NNT = 9
  – Decreased need for urgent intervention: NNT = 7

  – Trend toward decreased mortality (RR 0.62, 0.36 – 1.06)
Endoscopic Therapy

• *Endoscopic therapy should be provided to patients with active spurting or oozing bleeding or a non-bleeding visible vessel*
Peptic Ulcer Disease

Adherent Clot

Table 1. Study Criteria for Distinguishing Nonbleeding Adherent Clots and Nonbleeding Visible Vessels

<table>
<thead>
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<th>Visible vessel</th>
<th>Adherent clot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size(^a)</td>
<td>≤4 mm</td>
<td>≥6 mm</td>
</tr>
<tr>
<td>Color</td>
<td>Variable or translucent</td>
<td>Red</td>
</tr>
<tr>
<td>Form</td>
<td>Discrete</td>
<td>Amorphous</td>
</tr>
<tr>
<td>Relation to stigma</td>
<td>Is the stigma</td>
<td>Covers up stigma</td>
</tr>
<tr>
<td>Rebleeding rate(^b)</td>
<td>About 50%</td>
<td>About 35%</td>
</tr>
</tbody>
</table>

\(^a\) Size refers to diameter and height above ulcer base.

\(^b\) Rebleeding rate is on medical therapy (histamine two receptor antagonist drugs or proton pump inhibitors, transfusions, and correction of coagulopathies).

Peptic Ulcer Disease Adherent Clot

• **Endoscopic Therapy vs Medical Therapy**

  – Decrease in **rebleeding**: NNT = 6.3
  – Decrease in **need for surgery**: NNT = 13.3
  
  • If abstracts were excluded the need for surgery was not statistically significant

  – No difference in mortality

Peptic Ulcer Disease
Adherent Clot

• Early studies did not show any benefit of endoscopic monotherapy

• Later studies have shown combination therapy to be superior to medical therapy
  – Typically epinephrine is injected in 4 quadrants around the ulcer before removing the overlying clot (cold snare, suction, manipulation with biopsy forceps and the tip of the endoscope)
  – Treatment of the underlying stigmata has been treated with heater probe or bipolar electrocautery
Peptic Ulcer Disease
Adherent Clot

• Large ulcers (>2cm) and especially deep ulcers may contain exposed serosally based arteries.

• Ulcers with these features in the posterior duodenal bulb and along the lesser curvature of the stomach may be particularly vulnerable to containing large compromised arteries – the **gastroduodenal** in the bulb and the **left gastric** along the lesser curvature.
Peptic Ulcer Disease

Adherent Clot
Endoscopic Therapy

- Endoscopic therapy may be considered for patients with an adherent clot resistant to vigorous irrigation. Benefit may be greater in patients with clinical features potentially associated with a higher risk of rebleeding (e.g., older age, concurrent illness, inpatient at time bleeding began)
Endoscopic Therapy

• *Endoscopic therapy should not be provided to patients who have an ulcer with a clean base or a flat pigmented spot*
Peptic Ulcer Disease

Management of Patients With Ulcer Bleeding

Loren Laine, MD and Dennis M. Jensen, MD

ACG PRACTICE GUIDELINES

Endoscopic Therapy for Bleeding Ulcers: An Evidence-Based Approach Based on Meta-Analyses of Randomized Controlled Trials

LOREN LAINE* and KENNETH R. MCQUAID

CLINICAL GASTROENTEROLOGY AND HEPATOLOGY 2009;7:33–47
Peptic Ulcer Disease
Endoscopic Therapy

• **Monotherapy vs Epinephrine** (3 trials)
  
  – Decreased *further bleeding*: NNT = 9
  – Decreased *need for surgery*: NNT = 10

  – No significant difference in initial hemostasis
  – No difference in need for urgent intervention or mortality

* Heater probe, fibrin glue
Peptic Ulcer Disease
Endoscopic Therapy

• **Epinephrine + Second Modality vs Epinephrine** (7 trials)
  
  – Decreased **further bleeding**: NNT = 5
  – Decreased **need for surgery**: NNT = 13
  – Decreased **need for urgent intervention**: NNT = 6

  – No difference in mortality

**Second Modality**: heater probe, bipolar electrocautery, fibrin glue, or clip
Peptic Ulcer Disease
Endoscopic Therapy

- Epinephrine therapy should not be used alone. If used, it should be combined with a second modality.
  (Strong recommendation, high-quality evidence)
Peptic Ulcer Disease
Endoscopic Therapy

• Thermal therapy vs no therapy (15 studies)
  – Decreased further bleeding: NNT = 4
  – Decreased need for surgery: NNT = 8
  – Decreased need for urgent intervention: NNT = 8
  – Decreased mortality: NNT = 33

  – Heater probe and bipolar electrocautery were directly compared (3 trials) without significant difference
Peptic Ulcer Disease
Endoscopic Therapy

• Thermal therapy + epinephrine vs thermal therapy
  – Limited information suggests that epinephrine followed by thermal therapy may be more efficacious than thermal therapy alone
  – Data are insufficient to recommend that thermal thermal devices should not be used alone as monotherapy
Peptic Ulcer Disease
Endoscopic Therapy

• **Sclerosant vs no therapy**
  – Decreased further bleeding, need for surgery, need for urgent intervention, and mortality

• **Thermal therapy vs sclerosant injection**
  – Decreased need for **urgent intervention**: NNT = 7
  – Trend toward decreased further bleeding (RR 0.69, 0.47 – 1.01)
  – No significant difference in need for surgery or mortality
Peptic Ulcer Disease
Endoscopic Therapy

• Thermal therapy with bipolar electrocoagulation or heater probe and injection of sclerosant (e.g., absolute alcohol) are recommended because they decrease further bleeding, need for surgery, and mortality

  (Strong recommendation, high-quality evidence)
Peptic Ulcer Disease
Endoscopic Therapy

• Clips vs no therapy
  – Have not been compared

• Clips vs epinephrine
  – More effective than injection of epinephrine

• Clips + injection vs clips (2 studies)
  – No significant difference in further bleeding
  – Other outcomes were not provided
Peptic Ulcer Disease
Endoscopic Therapy

- Clips vs other standard therapies (4 trials)
  - Less effective at initial hemostasis: RR 0.78
  - No significant difference in further bleeding, need for surgery, need for urgent intervention, and mortality

Other therapies: heater probe, epinephrine + bipolar electrocautery, sclerosants with or without epinephrine
Peptic Ulcer Disease
Endoscopic Therapy

• *Clips are recommended because they appear to decrease further bleeding and need for surgery. However, comparisons of clips vs. other therapies yield variable results and currently used clips have not been well studied.*

  (Conditional recommendation, low-to-moderate quality evidence)
Peptic Ulcer Disease
Endoscopic Therapy

- For the subset of patients with actively bleeding ulcers, thermal therapy or epinephrine plus a second modality may be preferred over clips or sclerosant alone to achieve initial hemostasis

  (Conditional recommendation, low-to-moderate quality evidence)
Peptic Ulcer Disease
Endoscopic Therapy

• Despite showing efficacy in randomized trials, laser, monopolar electrocoagulation, argon plasma coagulation, and injection of thrombin or fibrin glue are not recommended as first-line therapies.
Peptic Ulcer Disease
Endoscopic Therapy – Summary

• Epi, thermal therapy and sclerosant injection are all better than nothing

• Heater probe and fibrin are better than epi; HP is no different than bipolar electrocautery

• Epi + heater probe, bipolar electrocautery, fibrin glue, or clip is better than epi

• Unclear if epi + thermal is better than thermal

• Clips are recommended but comparisons vs other modalities are not well studied
Peptic Ulcer Disease
Endoscopic Therapy – Summary

• The strongest recommendation/highest quality of evidence from ACG:

  – Thermal therapy with bipolar electrocoagulation or heater probe and injection of sclerosant
  – If epinephrine is used, it should be combined with a second modality.
Endoscopic Therapy
Mallory-Weiss Tear

- Ongoing or severe bleeding requires endoscopic therapy
- No prospective trials comparing treatment methods
- Bipolar electrocautery appears to be the most effective therapy
- Epinephrine, clips or band ligation also appear to be effective

ASGE Guideline: The Role of Endoscopy in the management of acute non-variceal upper GI bleed
Endoscopic Therapy
Dieulafoy lesion

- Endoscopic methods used to treat include: banding, clipping, electrocautery, cyanoacrylate glue, sclerosant injection, epinephrine, heater probe

- Tattooing of the lesion should be considered to facilitate identification if recurrent bleeding occurs

- Placement of a clip can help identify the lesion prior to IR or surgery
Endoscopic Therapy
Gastroc Antral Vascular Ectasia

• APC is the most commonly reported modality for the ablation (usually requiring multiple sessions)
• Heater probes, bipolar electrocautery, and band ligation have also been described
• Newer mucosal ablation techniques with radiofrequency and cryotherapy have been used in small pilot studies
Endoscopic Therapy
Vascular Ectasia

- Bipolar electrocautery, heater probes and APC have all been described in treating vascular ectasia