Acute Upper GI Bleeding: Inject or Burn?

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Background

- GI bleeding is a significant medical problem
  - Incidence 50-150 per 100,000
  - Over 300,000 hospital admissions per year
  - Up to 20,000 deaths per year in US
  - $2.5 billion per year

Lee JG. ASGE 12(4) 2005
Endoscopic therapy is the main bleeding treatment in these patients.

10x increased mortality if a patient rebleeds.
Sources of Non-variceal UGIB

- Ulcers
  - Erosions
  - Mallory-Weiss tear
  - AVM
  - Tumor

- Hemosuccus pancreaticus
- Hemobilia
- Iatrogenic (post-sphincterotomy, etc)
- Dieulefoy lesion
- Fistula (aortoenteric, etc)

Enestvedt et al. Gastrointest Endosc 2008
## Endoscopic Stigmata of Bleeding Ulcers & Rebleed Risk

<table>
<thead>
<tr>
<th>Stigmata</th>
<th>Prevalence (%)</th>
<th>Rebleed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleed</td>
<td>10-15</td>
<td>90</td>
</tr>
<tr>
<td>Visible vessel</td>
<td>15-25</td>
<td>50</td>
</tr>
<tr>
<td>Adherent clot</td>
<td>10-20</td>
<td>25</td>
</tr>
<tr>
<td>Flat spot</td>
<td>10-20</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Clean ulcer base</td>
<td>35</td>
<td>&lt; 5</td>
</tr>
</tbody>
</table>

EGD
Endoscopic Therapeutic Choices

- Injection
  - Epinephrine
  - Sclerosing agent
  - Thrombin/Fibrin Glue (theoretical adv of no tissue injury)

- Thermal
  - Bipolar electrocoag (Gold Probe) (heat + pressure)
  - Heater probe (heat + pressure)
  - APC (heat only)

- Mechanical
  - Clip (theoretical adv of no tissue injury)
  - Banding

- Combination
### Results of Endoscopic Therapy

Where it all began...

<table>
<thead>
<tr>
<th></th>
<th>Sham (n=23)</th>
<th>MPEC (n=21)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemostasis (%)</td>
<td>3 (13)</td>
<td>19 (90)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Blood Transfusions</td>
<td>5.4 ± 0.9</td>
<td>2.4 ± 0.9</td>
<td>0.002</td>
</tr>
<tr>
<td>Emergency Intervention</td>
<td>13 (57)</td>
<td>3 (14)</td>
<td>0.005</td>
</tr>
<tr>
<td>Hospital Stay (days)</td>
<td>7.2 ± 1.1</td>
<td>4.4 ± 0.8</td>
<td>0.02</td>
</tr>
<tr>
<td>Deaths (%)</td>
<td>3(13)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Hospital Cost ($)</td>
<td>7,550 ± 1,480</td>
<td>3,420 ± 750</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Injection

- Reduce blood flow by local tamponade
- Vasoconstricting agents reduce blood flow
  - Epi 1:10,000 – 1:100,000
- Various agents can be injected
  - Sclerosants
  - Ethanolamine
  - Polidocanol
- Ethanol
- Tissue adhesives

Park WG. Gastrointest Endosc 2007; 66:343
Thermal Therapy

- Applied perpendicularly or tangentially
- Coaptive coagulation: Compress vessel and then coagulate to seal vessel
- 7 and 10 Fr probes
- 15-20 Watts for multiple 8-12 sec pulses
- 4 to 6 pulses needed for adequate therapy
Endoscopic Thermal Therapy of a Bleeding Duodenal Ulcer – Closure of Perforation with Hemoclips

Todd H. Baron, MD
Mayo Clinic, Rochester
Epi Inj vs. Bicap vs. Combination Therapy

Patients randomized and Treated (n=96)

- **EPI (n=32)**
  - No initial Hemostasis (n=1)
  - Initial Hemostasis (n=31)
    - Rebleeding (n=11)
    - Hemostasis (n=20)

- **Bicap (n=32)**
  - No initial Hemostasis (n=2)
  - Initial Hemostasis (n=30)
    - Rebleeding (n=9)
    - Hemostasis (n=21)

- **Inj + Gold Probe (n=32)**
  - No initial Hemostasis (n=2)
  - Initial Hemostasis (n=30)
    - Rebleeding (n=2)
    - Hemostasis (n=28)

Lin HJ. Gut 1999;44:715
Epinephrine Alone is Inferior to Combination Therapy
Argon Plasma Coagulation (APC)

- APC vs. epi + sclerosant
  - No difference
- APC vs. Heater Probe
  - No difference
- APC + epi vs. Heater Probe + epi
  - No difference

CONCLUSION: APC can be used as a form of cautery

Laine L. Clin Gastroenterol Hepatol 2009
How About Hemoclips?

Potential advantage of no further tissue injury
Hemoclips

- Meta-analysis 15 RCT’s (n=1156)
  - Clips alone 390
  - Clips and Injection 242
  - Injection alone 359
  - Thermocoagulation with or without inject 165
- Hemoclips are superior than Inj therapy alone
  - Definitive hemostasis 86.5% vs. 75.4%
- Hemoclips comparable to thermal coagulation
  - Definitive hemostasis 81% vs 81.2%

Sung JJ et al. Gut 2007;56:1364
When to Use Hemoclips

- **Ideal scenario:**
  - Pliable lesion
  - Accessible
  - <2mm vessel
  - <2cm ulcer defect

- **Challenging scenario:**
  - Fibrotic base
  - Difficult location
    - Posterior duodenum
    - Posterior gastric wall
    - Lesser curvature of stomach
    - Retroflexion
Do PPI’s Really Add Any Value?
Injection + Thermal probe

Successful Hemostasis

Omeprazole 80/8 (N=120)  Placebo (N=120)

Rebleeding
Rebleeding (3 days)
Surgery
Deaths

No. of patients

Placebo
omeprazole

Even with endoscopic therapy, PPI’s ARE beneficial !!!
Preplanned systematic second endoscopy typically performed 24 hours after initial EGD

Older data supports 2nd look
- Primary improvement: rebleeding
- Often have suboptimal endoscopy therapy or post therapy PPI use
- Cost-effective only with high risk lesions

Generally, not recommended as routine

Barkun et al. Ann Int Med 2010
New Tools...
Summary:

- Endoscopic therapy saves lives and reduces morbidity
- Epinephrine injection alone should NOT be used
- Hemoclips and combination therapies are effective endoscopic treatments
- IV PPI’s should be given