Update on Gastrointestinal Bleeding

Update in Internal Medicine
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Learning Objectives

• Revise and update major causes of upper and lower GI bleeding
• Discuss important elements of the history; of the physical exam; diagnostic evaluations and use of patient risk stratifications....
• Study and apply updated guidelines (ACG/AASLD/NICE - 2016 updates) for the medical management and treatment of upper and lower GI bleeding; inclusive of variceal hemorrhage
• Review briefly clotting mechanisms and address new direct oral anticoagulants (DOAC), and consider differential impact on risks for gastrointestinal bleeding and thromboembolic risk
• Discuss case histories showing impact of oral anticoagulants and antiplatelet drugs on GI bleeding
Incidence and Significance

• 1-2% of all hospital admissions and increasing with greater application and use of new DOAC
  • Most common diagnosis amongst ICU admissions
  • Circa 5-10% require operative, surgical interventions after initial endoscopic evaluations and treatment
• 85% stop bleeding, medical therapies effective
• 7-12% mortality - 10-20,000 deaths per annum
  • Up to 40% for recurrent bleeding
  • Patients with massive bleeding need urgent intervention, often complicated by comorbidities
• Economic impact - 300,000 hospitalizations per year, cost estimates at around $2.5 billion
Anatomical sites

- Upper
  - Esophageal
  - Stomach
  - Duodenum
  - Hepatic
  - Pancreatic
- Mid-lower
  - Small bowel
  - Colon and rectum
  - Anus
Types of Bleeding

- **Upper**
  - Proximal to Ligament of Treitz
  - Melena (>200 cc of blood, acid/pepsin)
  - Azotemia
  - Nasogastric aspirate with blood

- **Lower**
  - Also distal to Ligament of Treitz
  - Hematochezia

Rare (<5-10%) mid-bowel sources – typically small bowel sources -- obscure GI bleeds (OGIB)
Predictors of mortality

• Renal disease 29% - acute renal failure 63%
• Liver disease >25%
  -- Role of coagulopathy……still unclear
• Pulmonary disease 23% with respiratory failure 57%
• Cardiac disease 13% with CHF 28%

Risk stratification scores –
Rockall (age, shock, co-morbidity, diagnosis and EGD)

Modified Glasgow-Blatchford (blood urea, Hb, BP and pulse)

AIMS65 (Alb, INR, mental status, systolic BP and age)
Clinical Presentation

*Hematemesi*s: bloody vomitus (bright red or coffee-grounds)
*Melena*: black, tarry, foul-smelling stool
*Hematochezia*: bright red or maroon blood per rectum
*Occult*: positive guaiac test in subacute/chronic presentations

*Symptoms of anemia and blood loss*: angina, dyspnea, or lightheadedness, syncope and potentially death
Acute UGIB

Differential diagnosis – usual suspects….

- Peptic ulcer disease
  - Gastric ulcer
  - Duodenal ulcer
- Mallory-Weiss tear
- Portal hypertension
  - Esophagogastric varices
  - Gastropathy
- Esophagitis

- Dieulafoy’s lesion
- Vascular anomalies
- Hemobilia
- Hemorrhagic gastropathy
- Aortoenteric fistula
- Neoplasms
  - Gastric cancer
  - Kaposi’s sarcoma
Diagnostics

Large caliber NGT – not required in all cases
  • Coffee grounds or gross blood identified
  • Can be used for lavage prior to endoscopy

Upper endoscopy acute indications and timing
  • Melena or hematochezia with hypotension
  • Hematemesis
  • NGT with guaiac positive fluid
  • Should be completed in <24 hrs for stable patients
# Gastrointestinal bleeding

*Prognostic Indicators*

<table>
<thead>
<tr>
<th>Nasogastric Aspirate</th>
<th>Stool Color</th>
<th>Mortality Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clear</strong></td>
<td>Red, brown, or black</td>
<td>10</td>
</tr>
<tr>
<td><strong>Coffee Grounds</strong></td>
<td>Brown or black</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>20</td>
</tr>
<tr>
<td><strong>Red Blood</strong></td>
<td>Black</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>30</td>
</tr>
</tbody>
</table>

Mallory-Weiss tear and ooze
Acute arterial-type bleeding

Dieulafoy’s lesion

_The Hitchhiker's Guide to the Galaxy_

All bleeding will stop. Anonymous. 2001.
Upper GI hemorrhage probabilities

Etiology frequencies

- Peptic ulcer disease - 50%
- Varices – 10-20%
- Gastritis – 10-25%
- Mallory-Weiss – 8-10%
- Esophagitis – 3-5%
- Malignancy – 3%
- Dieulafoy’s lesions – 1-3%
- Aorto-duodenal/enteric fistulae - <1%
- Other obscure causes, lymphoma - 1-3%
Endoscopic appearance of peptic ulcers
Peptic ulcer hemorrhage

Characteristics

• 20% of patients bleed at least once
• Hemorrhage is most lethal complication
• Vessel is usually <1mm diameter
• Underlying causes
  H. pylori 40-50%....cure feasible
  NSAID’s 40-50%.....avoidance/Cox2 drugs
  Other (e.g. Z-E syndrome)

Factors ppt hemorrhage unclear....?
Management of upper GI bleeding

- ABC, hemodynamic status/stratify risks
- Resuscitate (IVF, PRBC, FFP and platelets) to achieve Hb above 7 g/dl. A threshold of 9 g/dl should be considered in patients with massive bleeding, significant comorbid illness (especially cardiovascular ischemia) or possible endoscopic delays
- Treat initially as peptic ulcer disease (PPI) and in instance of chronic liver disease, add in specific therapies…..
- Early endoscopy to direct Rx - <24 hours
- Consider intubation airway protection and nasogastric tube to evaluate bleeding
Nasogastric tubes…low quality evidence

“Pro’s”:
Suctioning blood from the stomach may improve endoscopic visualization. Large amount of red blood is highly specific for large UGIB requiring early endoscopy - and gets everyone’s attention

“Con’s”:
Endoscopy is diagnostic/therapeutic procedure of choice, period. Sensitivity/specificity of NG lavage alone for active bleeding is poor and inadequate alone to guide management

Not always required – putative benefit from IV erythromycin
RCT: IV omeprazole (80mg x 1 + 8mg/hr) vs. placebo AFTER endoscopy

240 patients with endoscopic evidence of active or recent ulcer bleeding.....putative impact of pH on hemostasis and bleeding.....

Findings: IV PPI after endoscopic treatment decreased risk of recurrent bleeding during the 30 day study period (22.5% vs. 6.5%).
RCT: IV omeprazole (80mg x 1 + 8mg/hr) vs. placebo BEFORE endoscopy [then all patients got PPI after the endoscopy]

Study of 638 patients presenting to ED with UGIB. Excluded patients with refractory hypotension and ASA users

Findings: IV PPI before EGD ‘downstaged’ the ulcer, decreased need for endoscopic treatment (i.e. epi, endoclips); but DID NOT change mortality/recurrent bleeding within 30 days
Management of peptic ulcer hemorrhage

Endoscopic intervention success

- 95% initially
- 20% will rebleed....

Predictors at EGD......

- Repeat treatment after rebleed will salvage around 50% patients

--- Increased risk of mortality with rebleeding.....
Ulcer appearance and risk of re-bleeding

“Clean based”

Prevalence %

Risk of rebleeding %
Ulcer appearance and risk of re-bleeding

“Pigmented spot”

Prevalence %

Risk of bleeding %

Forrest et al. Lancet 1974
Ulcer appearance and risk of re-bleeding

"Adherent clot"

Prevalence %

Risk of bleeding %

Forrest et al. Lancet 1974
Ulcer appearance and risk of re-bleeding

Prevalence %

40  20  15  15  10

“Visible vessel”

Risk of bleeding %

5   10   20   45   55

Forrest et al. Lancet 1974
Ulcer appearance and risk of re-bleeding

Prevalence %

Risk of bleeding %

“Active bleeding”

Forrest et al. Lancet 1974
NIH consensus - endoscopic therapy

• Stops active bleeding
• Significantly decreases risk of rebleeding
• Limits levels of blood transfusion
• Decreases need for surgical management….
Endoscopic therapies

- Bipolar and multipolar electrocoagulation
- Heater probes, Argon plasma coagulator
- Hemoclips and Band ligation
- Injection (Epi, sclerosant, EtOH, saline)
  - Several RCTs show Epi + 2nd Rx improves hemostasis vs. Epi alone
  - Epi always be followed by 2nd modality (thermal, sclerosant)
Injection, Multipolar Coagulation and Clipping
GI hemorrhage, coagulation and clipping
Dieulafoy's lesion
<table>
<thead>
<tr>
<th>Signs</th>
<th>Risk of Recurrent Bleeding with Medical Therapy Alone</th>
<th>Risk of Recurrent Bleeding with Endoscopic Hemostasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active arterial bleeding (spurting)</td>
<td>85%–95%</td>
<td>10%–20%</td>
</tr>
<tr>
<td>Nonbleeding visible vessel</td>
<td>50%</td>
<td>5%–10%</td>
</tr>
<tr>
<td>Nonbleeding adherent clot</td>
<td>35%</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Ulcer oozing</td>
<td>10%–25%</td>
<td>&lt; 5%</td>
</tr>
<tr>
<td>Flat spots</td>
<td>7%</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Clean-based ulcer</td>
<td>3%</td>
<td>Not indicated</td>
</tr>
</tbody>
</table>


Jenson, DM. et al. Gastrointest Endosc 2005

Kovacs, TO. et al. Curr Treat Options Gastroenterol 2007
Case Presentation

• 67 yr man taking NSAIDs for the past 2 wks and developed epigastric pain. Passage of black tarry stools.....2 days

• PMHx: Not significant other than episodic lower back ache; potential insulin resistance, over weight but no other co-morbidities
  SHx/FHx: Neg

• Vitals: BP 105/75  P 90  BMI 30

• PE: otherwise normal, abdomen unremarkable, no overt features of liver disease but palpable liver edge......
Patient Assessment

- Hemodynamic status crucial
- Localization of bleeding source
- CBC, PT, Platelets, PTT, LFTs, Renal function tests, rule out myocardial ischemia in elderly or cardiac issues
- Risk factors with use of validated score
- Rockall (age, BP, co morbidity, diagnosis and EGD - ABCDE) – pre EGD score 1-4 points (2.4 - 25% mortality)
- Modified Glasgow-Blatchford – score 7 – 50% need of intervention…..
Resuscitation and Medical management

- Monitored bed or ICU
- Oxygen and NBM until stabilized, Glucose monitoring and control
- 2 large bore peripheral 16 G IV lines and/or CVP
- Normal saline with IV PPI
- Packed RBCs to maintain Hb over 7 g/dL, given caveat of active bleeding; those with unstable angina may require Hb >9.
- Correct coagulopathy
- Endoscopy and additional diagnostic tests
Esophageal Varices
Chronic liver disease.....

Plan B
Upper GI bleeding in portal hypertension

... if you suspect variceal bleed*

1) Resuscitation, urgent triage.
2) IV Octreotide (50mcg + 50mgc/hr for 5 days)
3) ? NG tube
4) Antibiotic treatment (IV ceftriaxone as prophylaxis for SBP) and lactulose once stabilized
5) Urgent endoscopy for banding/sclerotherapy/
      ......evaluation for endotracheal intubation
6) Balloon tamponade
7) Recurrent/massive bleeding or earlier pre-emptive decision → Transcutaneous Intrahepatic Portosystemic Shunt viz. TIPS

* Known varices, known cirrhosis, or exam/imaging/lab findings concerning for cirrhosis with portal hypertension (low plts, low albumin, coagulopathy…); portal hypertension alone
Acute Variceal Bleeding: Endoscopic Therapy and Octreotide/Somatostatin

Addition of octreotide or somatostatin to endoscopic therapy decreases further bleeding and transfusion requirements over 5 days (or hospitalization)

Terlipressin.....in USA trials

Besson et al., NEJM 1995
Sung, et al., Lancet 1995
Avgerinos et al, Lancet 1997
(A) Identification of bleeding varix; (B) Application of ligating attachment to varix; (C) Application of suction through endoscope; (D) Traction on trip wire, resulting in release of prestressed rubber band and ligation of varix; (E) Final result. Endoscope is then withdrawn through overtube, reloaded, and further bands applied to other variceal cords.
Variceal band ligation in action
Esophageal Varices

Bleeding varix

After endoscopic banding
Balloon Tamponade

Krieg et al. BMJ 2001
Early TIPS (Transjugular Intrahepatic Portosystemic Shunt) Cooperative Study Group


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Gastric varices and glue ablation
Synopsis Upper GIB

• Initial focus on resuscitation, risk-stratification based on features such as hemodynamic status, comorbidities, age and laboratory tests.

• Consider ulcer treatment unless specific evidence of cirrhosis or portal hypertension (ascites, low platelets, spleen enlargement, poor synthetic function)

• NG tubes may be placed, even in patient with varices - only exception is patients with banding in the last ~1 week – main function to remove blood clots, facilitate endoscopy…

• Involve the surgeons and interventional radiologists early – multi-disciplinary team management

• In presentation with massive LGIB, ALWAYS evaluate for any upper GI source
Acute lower GI bleeds

Differential Diagnosis

- Diverticulosis
- Colitis
  - IBD (UC>>CD)
  - Ischemia
  - Infection
- Vascular anomalies
- Neoplasia
- Anorectal
  - Hemorrhoids
  - Fissure
- Dieulafoy’s lesion
- Varices
  - Small bowel
  - Rectal
- Aortoenteric fistula
- Kaposi’s sarcoma
- Other obscure……

- UPPER GI BLEED
# Acute Lower GI Bleed
Diagnoses with hemodynamic compromise.

<table>
<thead>
<tr>
<th>DIAGNOSES</th>
<th>% OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverticulosis</td>
<td>17-40</td>
</tr>
<tr>
<td>Vasc. anomalies</td>
<td>2-30</td>
</tr>
<tr>
<td>Colitis</td>
<td>9-21</td>
</tr>
<tr>
<td>Neoplasia/polypectomy</td>
<td>11-14</td>
</tr>
<tr>
<td>Anorectal</td>
<td>4-10</td>
</tr>
<tr>
<td>Upper GI sites</td>
<td>&lt;11</td>
</tr>
</tbody>
</table>

Zuccaro. ASGE Clinical Update. 1999.
Acute Lower GI Bleed
Key management points

- Resuscitation
- Exclude UGI source
- Most of the bleeding ceases spontaneously.... circa 5% mortality
- Colonoscopy – early, as feasible, with no role for barium studies - <24 hours
- CT angiography and angiography highly useful....
- Surgery in consultation
Diverticular disease and hemorrhage
Colonic arteriovenous malformations
Radiation Proctitis

1-5% of all lower GI bleeds (tenesmus)

- Typically 9 mo to 5 years post-irradiation for pelvic malignancy
- Friable mucosae and telangiectasis (angiogenesis)
- Treatment (vexation)
Hemorrhoids
Non-Colonoscopy Interventions

• Surgical consultation in patients with high-risk clinical features and ongoing bleeding – therapeutic options failing and comorbid disease

• Localize the possible source of bleeding before surgical resection to avoid continued bleeding

• Radiographic interventions in patients with high-risk clinical features and ongoing bleeding. Computed tomographic (CT) angiography for localization of the bleeding site before interventional angiography

• Other tests ..... directed at subacute bleeding
Indications for capsule endoscopy

Obscure gastrointestinal bleeding
Small intestinal sources

Maximize likelihood of positive finding in pt with Hb < 10, longer duration of bleeding (>6 months), more than 1 episode of overt bleeding and use of CE within 2 weeks of the bleeding episode

Indications for enteroscopy

Diagnostic

– Obscure gastrointestinal bleeding
– Exploration of radiographic abnormalities
– Investigation of small bowel tumors

• Therapeutic
• Surveillance

Single balloon enteroscopy

Retained capsule in small bowel

Area of mass in mid jejunum

Area of mass in mid jejunum

Area of mass in mid jejunum
Targets of new anticoagulant drugs
Targets of new anticoagulant drugs - increased risk of GI bleeding?

Holster et al Gastroenterology. 2013;145(1):105-112
OR for GI bleeding among patients taking these new drugs is 1.45 (95% confidence interval 1.07–1.97).

DOAC - Synopsis

• Direct oral anticoagulants – becoming popular choices for stroke and thromboembolism protection

• Highly predictable fixed dosing without the necessity for monitoring of anticoagulant effect.

• Greater risk of gastrointestinal (GI) bleeding...about 30%

• Age > 65 years, hepatorenal dysfunction, lower body weight, other prescription of antiplatelet agents, or non-steroidal anti-inflammatory drugs, and/or drugs interacting with P-glycoprotein/cytochrome P450 system impact therapeutic effectiveness of DOACs and increase rates of GI bleeding
DOAC – Use in Cardiac Disease and risk GI Bleeds

• Prevalence of e.g. atrial fibrillation amongst patients > 65 years in USA approximates 3.4 million patients (around 1 in 100 citizens)

• Relative to general population, atrial fibrillation patients have an increased risk of GI bleeding (0.3 – 0.5 % per year vs. 0.1 % per year) just with chronic use of warfarin…..

• Dabigatran and rivaroxaban - associated with circa 30 % increase in GI bleeding over warfarin

• Estimates of 0.4– 0.7% of patients will experience a DOAC-related GI bleed, which rounds off at 15,000 – 20,000 DOAC-related GI bleeds per year…..

Am J Gastroenterol Suppl 2016; 3:2– 12; doi: 10.1038/ajgsup.2016.2
Bleeding risk, hemostasis and coagulation tests

- Endoscopic hemostasis may be considered with INR of 1.5–2.5 with reversal before endoscopy in patients with an INR >2.5

- Platelet transfusion to maintain a platelet count of >50K with severe bleeding and prior to endoscopic hemostasis

- Platelet and plasma transfusions should be considered in patients who receive massive transfusions

- In patients on (new) anticoagulant agents, a multidisciplinary approach (with colleagues in hematology, cardiology, neurology, and gastroenterology) should be used to discontinue medications/use reversal agents to balance risk of ongoing bleeding vs. risk of thromboembolic events
Thrombus formation in injured blood vessels

- Bright Field
- Tissue factor
- Platelets
- Fibrin
- Merge
Case II

Antiplatelet drugs and GI bleeding

- 79 yrs woman with HTN, ESRD on HD; who developed an episode of aphasia during dialysis
- Concern for TIA ---- ASA 325 mg daily
- Soon after she was noted to have an episode of hematemesis and some hematochezia and dark stool.....
- Denies any prior GI bleeding, no lightheadedness, weakness, nausea
- Denies any OTC NSAIDs, and no alcohol
- No further bowel movements
ED course

- Vitals: HR 69 BP 132/54
- Hct 23.5, post dialysis
- Head CT showed no acute process
- NG lavage scant coffee grounds, cleared with small amount of saline
- Patient was treated with:
  - 1 to 2 units PRBC
  - Protonix infusion
  - Octreotide infusion
- Patient transferred to BIDMC
BIDMC Course

- Vitals: HR 100 BP 120/40 RR 16, 100% on room air
- Pt appears well in no acute distress
- NG tube
- Cardiac: 2/6 crescendo murmur at LUSB
- Lungs: CTA bilaterally
- ABD: Soft nt/nd, no stigmata of chronic liver issues
- Rectal: scant amount of clotted blood, no stool
- Noted to be DNI/DNR

Glasgow-Blanchard Score – 14 – high risk
First EGD
Repeat Hct at dawn – decreasing…..

stomach body with old blood

antrum with old blood
## GI bleeding and ASA usage

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Relative Risk of Gastrointestinal Bleeding According to Dose of Aspirin Use(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aspirin Tablets (325 mg) per Week</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td><strong>All cases(^b)</strong></td>
<td></td>
</tr>
<tr>
<td>No. of cases/person-years</td>
<td>141/175,282</td>
</tr>
<tr>
<td>Age-adjusted RR (95% CI)</td>
<td>1.0</td>
</tr>
<tr>
<td>Multivariate RR (95% CI)(^c)</td>
<td>1.0</td>
</tr>
<tr>
<td>Multivariate RR + duration (95% CI)(^d)</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Upper gastrointestinal bleeding(^e)</strong></td>
<td></td>
</tr>
<tr>
<td>No. of cases/person-years</td>
<td>48/175,282</td>
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<tr>
<td>Age-adjusted RR (95% CI)</td>
<td>1.0</td>
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<tr>
<td>Multivariate RR (95% CI)(^c)</td>
<td>1.0</td>
</tr>
<tr>
<td>Multivariate RR + duration (95% CI)(^d)</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Recurrent upper GI bleed within 30 days - non significant differences between continued use of ASA and placebo
Repeat EGD – Epi + Clips

2nd portion of the duodenum

Antrum

Bleeding duodenal bulb ulcer with visit

Duodenal bulb ulcer s/p epinephrine injection

Duodenal bulb ulcer s/p hemoclip placement

Duodenal bulb ulcer s/p hemoclip placement
Risk rebleeding higher in patients with ESRD on HD…and she did so…

Table 2  Multivariate Cox proportional hazards model analysis for prediction of peptic ulcer rebleeding

<table>
<thead>
<tr>
<th>Condition</th>
<th>HRs</th>
<th>95% CI</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>End stage renal disease</td>
<td>1.38</td>
<td>1.30 to 1.46</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Ulcerogenic drugs*</td>
<td>1.03</td>
<td>1.02 to 1.03</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Helicobacter pylori</td>
<td>1.19</td>
<td>1.13 to 1.25</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>0.83</td>
<td>0.76 to 0.91</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.02</td>
<td>0.97 to 1.07</td>
<td>0.4352</td>
</tr>
<tr>
<td>Liver cirrhosis</td>
<td>1.44</td>
<td>1.37 to 1.51</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

*Each 10% incremental use in frequency.

Wu, CY. et al. Gut 2011
“Where available, percutaneous embolization can be considered as an alternative to surgery for patients for whom endoscopic therapy has failed.”

She underwent selective vessel embolization...experienced repeat hemorrhage....surgical consult.

Barkun, A. et al Annals of Internal Medicine 2010
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>ENDOSCOPIC RETREATMENT (N = 48)</th>
<th>SURGERY (N = 44)</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of hospitalization (days)</td>
<td></td>
<td></td>
<td>0.59</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>11</td>
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</tr>
<tr>
<td>Range</td>
<td>2-111</td>
<td>4-42</td>
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<tr>
<td>Hospitalization in intensive care unit</td>
<td></td>
<td></td>
<td>0.16</td>
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<tr>
<td>Length of stay (days)</td>
<td>59</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>No. of patients</td>
<td>5</td>
<td>10</td>
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</tr>
<tr>
<td>Units of blood transfused</td>
<td></td>
<td></td>
<td>0.27</td>
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<tr>
<td>Median</td>
<td>8</td>
<td>7</td>
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<td>Range</td>
<td>1-21</td>
<td>3-150</td>
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<tr>
<td>Complications</td>
<td></td>
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<tr>
<td>No. of complications</td>
<td>22</td>
<td>28</td>
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<tr>
<td>No. of patients</td>
<td>7</td>
<td>16</td>
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<tr>
<td>30-Day mortality (no. of patients)</td>
<td></td>
<td></td>
<td>0.37</td>
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<tr>
<td>Abdominal sepsis</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>Bronchopneumonia</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Multiorgan dysfunction</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hepatic failure</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ventricular arrhythmia</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Summary

• Surgery consulted again
  – Vagotomy/pyloroplasty/oversewing ulcer/J-tube placed

• Synopsis:
  – 4 x EGD (4 clips, cautery, injections)
  – 1 x IR placed 14 coils
  – 34 units of PRBC
  – 13 units of FFP
  – 5 units Platelets
  – 6 units Cryoprecipitate
  – 1 x Surgery
Take away points…..

• Aspirin carries risk of ulceration and bleeding
• Consider early reintroduction and use of PPI in appropriate patients - secondary prophylaxis…
• Risks of rebleeding? (as per Macbeth - "they say, blood will have blood" (3.4.121)).
  – General risk based on visualization of ulcer
  – Risks also dictated by patient and co morbidity
• Massive GI bleed - involve multidisciplinary team:
  – Role of ICU, Nursing staff, PCP, GI, Surgery, IR …..in all cases
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