It’s late Friday afternoon and the doc says he has an emergency, REALLY??

Gustavo Mariño, MD
VA Medical Center
Washington, DC
True emergency?

- Likelihood that an intervention is required to improve outcomes
- Optimal timing
- Other factors: VIPs?, demanding patient?, convenience?,

Vs

Pivotphysicaltherapy.com

www.wolfescape.com
Planning / Team management

• Preparation: unit requirements, staff
• Coverage: GI lab regular hours, on call team, “bleeding” team?
• Competencies updated / revalidated
• Travel cart, crash cart: check list / log
• Therapeutic kits: hemostasis, foreign body, perforation tx; balloon tamponade
• Therapeutic endoscopes
• Endoscope reprocessing after hours / weekends
Planning / Patient Care

• Preprocedure risk assessment: hemodynamic stability, respiratory function, mental function
• Resuscitation: IV access, pressors, octreotide
• Where should the procedure be performed: ER, ICU, GI lab, another facility?
• Coordinate with other teams: anesthesia, surgery, radiology, blood bank, lab
• Transfusions, available blood products
• Consent
• Post-procedure recovery plans: ICU/monitored bed, floor
Clinical scenarios

• GI bleeding
• Esophageal impaction / Foreign body
• Post-op biliary leaks
• Cholangitis
• Acute pancreatitis
• Gastrointestinal obstruction: volvulus, Ogilvie
• Gastrointestinal perforation
GI bleeding - Risk analysis

- Spontaneous cessation of bleeding in ~80%
- Continued bleeding requiring intervention ~ 15%
- Main cause of death is end-organ injury, decompensation of comorbidities, complications from transfusions. Rarely from blood loss.
- Patients with rebleeding have a higher mortality: 30-37% **
- => Risk stratification

*Rotondano, Gastroint Clin Nam 2014
Blatchford, BMJ 1997
Endoscopy following Acute Coronary Syndrome

- Incidence of GI bleeding following PCI is ~2%; ↑ mortality
- Urgent EGD for GI bleeding with acute MI before catheterization ↓ mortality: 6% vs 1%
- ↑ mortality within 24 hours after ACS; fatal arrhythmias
- Inverse relationship b/w complications and timing from ACS
- Complication rate within 2 mo after ACS: 9% Hypotension, arrhythmias, ACS
- Endo => Adrenergic response => ischemia => arrhythmias

- Discuss plans with cardiology: monitoring / anticoagulation

Systematic review, Mc Gill University
GI bleeding
Consider possible etiology...

• Upper vs lower GI bleeding (middle GI bleeding)

<table>
<thead>
<tr>
<th></th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOCK</td>
<td>35%</td>
<td>19%</td>
</tr>
<tr>
<td>TRANSFUSION</td>
<td>65%</td>
<td>36%</td>
</tr>
<tr>
<td>REQUIRE INTERVENTION</td>
<td>~ 30%</td>
<td>&lt; 10%</td>
</tr>
</tbody>
</table>

• Upper:
  • Peptic ulcer disease accounts for 2/3 of cases *
  • Esophageal / Gastric varices
  • Aorto-enteric / Aorto-esophageal fistula
  • Recent therapeutic endoscopy (eg: papillotomy, polypectomy)
Upper vs. lower bleeding

Above vs. below ligament of Treitz

70% Upper GI bleeding

- Hematemesis
- + macro NG aspirate
- Melena (on exam)
- BUN/sCr >30

30% Lower GI bleeding

- Hematochezia
- Bile in NG aspirate

UGI source Likelihood Ratio

<table>
<thead>
<tr>
<th>UGI source</th>
<th>Likelihood Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>7.5</td>
</tr>
</tbody>
</table>

Srygley et al. JAMA 2012
GI bleeding - Risk stratification

- Comorbidities
- Hemodynamic instability
- Active / recurrent bleeding
Comorbidities

• Coronary artery disease
• Pulmonary disease
• Renal failure
• Liver disease
• Cancer
• Alcoholism
• Anticoagulation
• Vascular disease/surgery
• Age (indirectly)
### Glasgow-Blanchford Score

<table>
<thead>
<tr>
<th>Admission parameter</th>
<th>Score value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urea (mg/dL)</strong></td>
<td></td>
</tr>
<tr>
<td>≥6.5 to &lt;8.0</td>
<td>2</td>
</tr>
<tr>
<td>≥8 to &lt;10.0</td>
<td>3</td>
</tr>
<tr>
<td>≥10.0 to &lt;25.0</td>
<td>4</td>
</tr>
<tr>
<td>≥25.0</td>
<td>6</td>
</tr>
<tr>
<td><strong>Haemoglobin (g/dL)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
</tr>
<tr>
<td>≥12.0 to &lt;13</td>
<td>1</td>
</tr>
<tr>
<td>≥10.0 to &lt;12.0</td>
<td>3</td>
</tr>
<tr>
<td>&lt;10.0</td>
<td>6</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
</tr>
<tr>
<td>≥10.0 to &lt;12.0</td>
<td>1</td>
</tr>
<tr>
<td>&lt;10.0</td>
<td>6</td>
</tr>
<tr>
<td><strong>Systolic BP (mmHg)</strong></td>
<td></td>
</tr>
<tr>
<td>100 to 109</td>
<td>1</td>
</tr>
<tr>
<td>90 to 99</td>
<td>2</td>
</tr>
<tr>
<td>&lt;90</td>
<td>3</td>
</tr>
<tr>
<td><strong>Other parameters</strong></td>
<td></td>
</tr>
<tr>
<td>Pulse &gt;100 bpm</td>
<td>1</td>
</tr>
<tr>
<td>Melena at presentation</td>
<td>1</td>
</tr>
<tr>
<td>Syncope</td>
<td>2</td>
</tr>
<tr>
<td>Hepatic disease</td>
<td>2</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>2</td>
</tr>
</tbody>
</table>

**Score ≥ 6:** Greater than 50% risk of needing an intervention

GBS has superior sensitivity relative to the AIMS65 in identifying patients who were not likely to require interventions, including emergency endoscopy.

Acad Int Med 2015 Yaka et al
### AIMS65

#### Mortality rate

<table>
<thead>
<tr>
<th>Mortality rate</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.3%</td>
</tr>
<tr>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>15%</td>
</tr>
<tr>
<td>5</td>
<td>25%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>One point for each parameter</th>
<th>Alternative description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>&lt;3.0 g/dL (30 g/L)</td>
<td></td>
</tr>
<tr>
<td>INR</td>
<td>&gt;1.5</td>
<td></td>
</tr>
<tr>
<td>Mental status</td>
<td>Glasgow coma score &lt;14</td>
<td>Disorientation, lethargy, stupor, or coma</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>&lt;90 mmHg</td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td>&gt;65</td>
<td></td>
</tr>
</tbody>
</table>
GI bleeding management

- Double IV access / large bore
- Anticoagulation reversal: INR > 3.5
- Airway protection
- Coronary artery disease, recent ischemic event?
- Transfusion goal Hb > 7, >10 w active CAD (restrictive strategy)

Villanueva, et al. NEJM 2013
Upper GI bleeding
Medical Management

- PPI
- Octreotide
- Antibiotics
- Erythromycin
- Endoscopy
EGD timing guidelines

- Emergent: within 6-8 hours
- Urgent: within 24 hours

- ACG 2012 : (Laine et al, Gastroenterol 2012)
  - Patients with upper GI bleeding should generally undergo endoscopy within 24 hours of admission, following resuscitative efforts to optimize hemodynamic parameters

  - Early endoscopy, within 24 hours of presentation, is recommended for most patients with acute gastrointestinal bleeding
Emergent vs Urgent Endoscopy

- Retrospective review of 934 patients w GI bleeding
- Timing ≤ 13h VS. > 13 h
- Blatchford risk score: <12 VS. ≥ 12

- Mortality (all causes)
  - Low-risk patients: same
  - High risk patients: 44% (endo time > 13 h) VS 0% (early endo)
  - Multivariate analysis showed presentation-to-endo time as only factor associated with mortality

Emergent vs. Urgent Endoscopy

- Analysis of 3 national, multi-center databases (PNED 1 & 2, prometio)
- 3207 patients w non-variceal upper GI bleed

Marmo R, et al. DDW 2011
Emergent Endoscopy

- After hemodynamic resuscitation / stabilization
- Active bleeding: hematemesis, NG (+ aspirate)
- Suspected variceal bleeding
- Adequate support staff
- Back up:
  - balloon tamponade
  - Interventional radiology
  - surgery
## Endoscopic Predictors of Rebleeding - Ulcer

<table>
<thead>
<tr>
<th>Endoscopic Finding</th>
<th>Re-Bleeding (%)</th>
<th>Mortality Rate(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding</td>
<td>55-90</td>
<td>11</td>
</tr>
<tr>
<td>Visible vessel</td>
<td>45</td>
<td>11</td>
</tr>
<tr>
<td>Adherent clot</td>
<td>22-30</td>
<td>7</td>
</tr>
<tr>
<td>Pigmented spot</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Clean ulcer base</td>
<td>&lt;5</td>
<td>2</td>
</tr>
</tbody>
</table>
Endoscopic hemostatic modalities

**Injection**
- Epinephrine
- Ethanol
- Ethanolamine
- Polidocanol
- Thrombin
- Fibrin
- Cyanoacrylate

**Mechanical**
- TTS clips
- OTS clips
- Band ligation
- Sewing
- Endoloop

**Thermal**
- **Contact**
  - Monopolar electrocoag
  - Bipolar or multipolar coag
  - Heater probe
- **Non contact**
  - Laser: argon or Nd-YAG
  - Argon plasma coagulation

**Hemostatic Spray**
- Hemospray
- Ankaferd

**Hemostatic Spray**
- Hemospray
- Ankaferd
Variceal Bleeding

- 6 week mortality 20% despite dx and tx
- Timing of EGD:
  - AASLD guidelines: within 12 hours
  - Urgency determined by severity
- Airway protection
- Endoscopic treatment: banding, sclerotherapy, esophageal stent

Kappoor et al. GI Endo Clin Nam 2015
Natural History of Portal Hypertension

- Cirrhosis No varices
  - Varices
    - Variceal Hemorrhage
      - Recurrent hemorrhage
      - Death

Risk of complications:
- Varical Hemorrhage: 30% @ 30d (Child C)
- Recurrent hemorrhage: >60%/year
- Death: 100%
- Variceal Hemorrhage: 50%
- Varices: ~15%/year
- Cirrhosis No varices: ~7-8%/year
Gastric varices
Balloon-tamponade for variceal bleeding

- Control of bleeding in up to 90% of cases
- Rebleeding in 50% when balloons are deflated
- >30% risk of complications
  - Pneumonia
  - Airway obstruction
  - Esophageal necrosis/perforation, ulceration, fistula
  - Alar (nose) necrosis
- Temporizing measure when patient is exsanguinating => TIPS, surgery, transplantation
- Requires experience, clear protocol

Sangstaken-Blackmore, Minesotta, or Linton tube

* Schwartz, Tech Gastroint Endosc 2005

Avgerinos et al. Scand J Gastroenterol 1994

*
Lower GI bleeding

- 10-15% of patients with hematochezia have UGI source => EGD
- Colonoscopy ?? Optimal timing; preparation; outcomes..
  - ACG guideline 2016: colonoscopy within 24 hours, adequate preparation
  - Clips rather than thermal tx for diverticular bleeding
  - APC for bleeding AVM's

- Options:
  - Bleeding scan (nuclear medicine)
  - Angiography
  - CT angio

- High risk patients w ongoing bleeding, poor response to resuscitation or unable to prep => radiographic options
Randomized trial
Emergent (<6 h) vs Elective (36-60 h) Colonoscopy

N=85 => 13 UGI bleed; colo 36, Emergent colo 36

<table>
<thead>
<tr>
<th></th>
<th>URGENT</th>
<th>ELECTIVE</th>
<th>DIFFERENCE (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further bleeding</td>
<td>8 (22%)</td>
<td>5 (14%)</td>
<td>8% (-9 - 26%)</td>
</tr>
<tr>
<td>Units transfused</td>
<td>1.5 ±0.4</td>
<td>0.7 ± 0.2</td>
<td>0.9 (0.02 - 1.7)</td>
</tr>
<tr>
<td>after randomization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital days</td>
<td>5.2 ± 0.9</td>
<td>4.8 ± 0.5</td>
<td>0.4 (-1.8 - 2.6)</td>
</tr>
<tr>
<td>Need for subsequent</td>
<td>13 (36%)</td>
<td>12 (33%)</td>
<td>3% (-19 - 25%)</td>
</tr>
<tr>
<td>intervention dx or tx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Laine et al. Am J. Gastro 2010
Lower GI bleeding
Urgent Colonoscopy

- Active post-polypectomy bleeding; ± prep
- Persistent bleeding: frequent, ongoing bloody evacuations
  - Oral vs. NG prep 4+ liters
- Severity predictors:
  - Hct <35, sbp<100, hr>100, blood on rectal exam*
  - Syncope, > 2 comorbid diseases
- PEG rapid prep: 1 L / 30-45 min; continue until clear output
- Consider metoclopramide for nausea/vomiting, does not improve colonic preparation

Foreign Body Ingestion
Endoscopic Management

Emergencies:

- Complete obstruction of esophagus
- Respiratory distress
- Disk battery in esophagus
- Sharp object in esophagus / stomach
- Magnets
- Blunt object / Esophageal food Impaction reaching 24 h
Foreign Body Ingestion Complications

- Perforation
- Aortic or pulmonary fistula
- Mediastinitis
- Lung abscess
- Aspiration
- Death
Foreign body / Esophageal impaction

• Inability to swallow saliva => complete obstruction
• Odynophagia => r/o perforation, laceration
• Stridor, dyspnea, cough => tracheal compression?, aspiration?
• Psychiatric disorder / mental impairment?
Management

• Foreign body above UES? Stat ENT consult
• NO contrast study !!!
• X-rays + lateral films: neck, chest, abdomen
• No enzymatic attempts / meat tenderizer
• Glucagon? : avoid if h/o fixed obstruction
• EGD contraindicated
  • signs of perforation
  • drug containing packets
Acute Cholangitis

- Stones
- Strictures
- Occluded stents

Severity: Tokyo guideline (mild, mod, severe)
- Severe = organ dysfunction =
  - Hypotension, mental status, hypoxia, oliguria, sCR>2, INR>1.5, Platelet <100K
- Moderate = >72 H, wbc > 18K, mass in RUQ, cholecystitis, abscess
Cholangitis
Tokyo Guidelines 2013
Post-op Biliary Leak

- Bile duct injury in 0.5% of cholecystectomies
  - Leak, duct transection, ligation/occlusion, stones
- Cystic duct / Luschka: low output, good response to stent for 4-8 weeks
- Leak from major bile ducts: high output => stents 6-12 mo, delayed healing, risk of strictures
- Drainage of fluid collections, usually before ERCP
- Timing of ERCP: Once adequate conditions for ERCP available

Acute Biliary Pancreatitis

Indications for ERCP

• Cholangitis
• Persistent biliary obstruction, ERCP should be done within 72 h*

*Tse et al. Cochrane Database Syst Rev 2012
Volvulus

• Occurs mostly in distal 30 cm of colon
• R/O necrosis or perforation
• Goal to untwist sigmoid: insufflation and insertion
• Endoscopic initial success 80-100%
• ± insertion of rectal tube
• ~ 50% recurrence (days-months)
• Surgical consult: sigmoid resection / sigmoidopexy
Acute Colonic Pseudoobstruction
Ogilvie Syndrome

• ↑ sympathetic tone ↓ parasympathetic tone => functionally obstructing distal colon & relaxed proximally (adynamic colon).
• Patients w significant comorbidities /surgery
• Risk of perforation correlates duration & cecal diameter
  • > 9 -12 cm ; 14 cm = 23% perforated*
• Medical management: position, neostigmine
• Endo: Colonoscopic decompression
  • No preparation
  • ± decompression tube
  • Perforation rate 2%, mortality 1%

Vanek et al. Dis Col Rectum 1986
Gastrointestinal Perforation

• Expected with advanced endoscopic intervention
• Most of them have endoscopic treatment
• Early recognition: endoscopic and clinical signs
• Complications:
  • Tension pneumothorax / pneumoperitoneum
  • Abdominal compartment syndrome
  • Peritonitis
  • Subcutaneous emphysema => airway obstruction
• Post-procedure: CT w/ water-soluble contrast
• Surgery consult
Endoscopic Closure of Perforation

• Management:
  • Positioning: minimize intraluminal content leakage
  • Antibiotics, 1\textsuperscript{st} dose ASAP
  • CO\textsubscript{2}
  • Assess => choose technique (clips, OTSC, stent, suturing)
  • Closure attempt during same procedure

Rogalski et al. World J Gastro, 2015
Lee et al. Clinical Endo 2013
Role of Unsedated Transnasal EGD in Gastrointestinal Emergencies

- Upper GI bleeding
  - Diagnosis, risk of rebleeding, airway management
- Esophageal impaction / foreign body
  - Diagnosis, airway management, therapeutic
Clinical scenarios

• GI bleeding
• Esophageal impaction / Foreign body
• Post-op biliary leaks
• Cholangitis
• Acute pancreatitis
• Gastrointestinal obstruction: volvulus, Ogilvie
• Gastrointestinal perforation