

Gastrointestinal Hemorrhage

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Case

- ✦ 79 yo M transferred from OSH with blood per rectum
- ✦ 4u pRBC 2u FFP
- ✦ Mentating, HR 90s SBP 100s on RA
- ✦ No hx of GI bleed

Initial Assessment

- ✦ UGI bleed vs LGIB
- ✦ ABC
- ✦ Early intubation (?)
- ✦ IV access
- ✦ Labs, EKG
- ✦ Anoscopy/Rigid sigmoidoscopy
- ✦ NGT – quality?
 - ✦ Bilious or bloody?
 - ✦ False negative rate: 15%

Aljebreen et al: Nasogastric aspirate predicts high risk endoscopic lesions in patients with acute upper GI bleeding; Gastrointest Endosc. 2008

History

- ✦ Liver disease, gastric or esophageal varices
- ✦ Peptic ulcer disease
- ✦ *Helicobacter pylori* infection
- ✦ NSAID use
- ✦ Smoking or alcohol abuse
- ✦ AAA repair
- ✦ Gastroenteric anastomosis
- ✦ Anticoagulants

Palmer ED. The vigorous diagnostic approach to upper-gastrointestinal tract hemorrhage. A 23-year prospective study of 1,4000 patients. JAMA

Vital Signs

- ✦ Resting tachycardia: Less than 15% of blood volume
- ✦ Orthostatic hypotension: At least 15% of blood volume
- ✦ Supine hypotension: Blood volume loss of at least 40%

Cappell MS, Friedel D. Initial management of acute upper gastrointestinal bleeding: from initial evaluation up to gastrointestinal endoscopy. Med Clin North Am 2008

Factors predictive of UGI source

- ✦ Melena (hx or exam)
- ✦ Blood or coffee ground on NGT lavage
- ✦ BUN:Cr > 30

UGI bleed until proven otherwise!!!!

Srvgley FD, Gerardo CJ, Tran T, Fisher DA. Does this patient have a severe upper gastrointestinal bleed? JAMA 2012; 307:1072.

Upper GI Bleed – Differential Dx

- ✦ Over 400,000 pts/year hospitalized
- ✦ Majority: PUD
- ✦ Others:
 - ✦ Esophageal and gastric varices
 - ✦ Mallory – Weiss tears
 - ✦ Neoplasms
 - ✦ Dieulafoy lesions
 - ✦ Hemobilia
 - ✦ Aortoenteric fistulae

Lewis et al: Hospitalization and mortality rates from peptic ulcer disease and GI bleeding in the 1990s; *Am J Gastroenterol*. 2002
 Gralnek et al: Management of acute bleeding from a peptic ulcer; *N Eng J Med*, 2008

Nasogastric Lavage

- ✦ Controversial
- ✦ Retrospective case control study ~ 600 pts
- ✦ Randomized prospective trial - 280 pts
- ✦ NGT -> shorter interval to endoscopy
- ✦ No difference in mortality, LOS, surgery, transfusion

Huang ES, Karsan S, Kanwal F, et al. Impact of nasogastric lavage on outcomes in acute GI bleeding. *Gastrointest Endosc* 2011; 74:971.
 Rockey DC, Ahn C, de Melo SW Jr. Randomized pragmatic trial of nasogastric tube placement in patients with upper gastrointestinal tract bleeding. *J Investig Med* 2017

Endotracheal intubation?

Association of prophylactic endotracheal intubation in critically ill patients with upper GI bleeding and cardiopulmonary unplanned events.

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Abstract

BACKGROUND AND AIMS: Prophylactic endotracheal intubation (PEI) is often advocated to mitigate the risk of cardiopulmonary adverse events in patients presenting with brisk upper GI bleeding (UGIB). However, the benefit of such a measure remains controversial. Our study aimed to compare the incidence of cardiopulmonary unplanned events between critically ill patients with brisk UGIB who underwent endotracheal intubation versus those who did not.

METHODS: Patients aged 18 years or older who presented at Cleveland Clinic between 2011 and 2014 with hematemesis and/or patients with melena with consequential hypovolemic shock were included. The primary outcome was a composite of several cardiopulmonary unplanned events (pneumonia, pulmonary edema, acute respiratory distress syndrome, persistent shock/hypotension after the procedure, arrhythmia, myocardial infarction, and cardiac arrest) occurring within 48 hours of the endoscopic procedure. Propensity score matching was used to match each patient 1:1 in variables that could influence the decision to intubate. These included Glasgow Blatchford Score, Charlson Comorbidity Index, and Acute Physiology and Chronic Health Evaluation scores.

RESULTS: Two hundred patients were included in the final analysis. The baseline characteristics, comorbidity scores, and prognostic scores were similar between the 2 groups. The overall cardiopulmonary unplanned event rates were significantly higher in the intubated group compared with the nonintubated group (20% vs 6%, $P = .008$), which remained significant ($P = .012$) after adjusting for the presence of esophageal varices.

CONCLUSIONS: PEI before an EGD for brisk UGIB in critically ill patients is associated with an increased risk of unplanned cardiopulmonary events. The benefits and risks of intubation should be carefully weighed when considering airway protection before an EGD in this group of patients.

Transfusion: pRBC

- ✦ Initial loss: whole blood
- ✦ Hb < 7 even in stable ischemic cardiac disease
- ✦ Hb = 9 ONLY in active bleed and unstable cardiac dz
- ✦ Overtransfusion in variceal bleeding is HARMFUL
- ✦ Meta-analysis of 5 randomized trials ~ 2000 pts
 - ✦ Restrictive transfusion: lower mortality and rebleed
 - ✦ No difference in acute MI or AKI

Odutayo A, Desborough MJ, Trivella M, et al. Restrictive versus liberal blood transfusion for gastrointestinal bleeding: a systematic review and meta-analysis of randomised controlled trials. *Lancet Gastroenterol Hepatol* 2017; 2:354.

Transfusion: platelets & coag factors

- ✦ Platelet goal > 50,000
- ✦ INR (non-cirrhotic) goal < 1.5 (FFP or PCC)
- ✦ Endoscopy is safe with INR < 3
- ✦ Aspirin and plavix: individualize treatment

Wolf AT, Wasan SK, Saltzman JR. Impact of anticoagulation on rebleeding following endoscopic therapy for nonvariceal upper gastrointestinal hemorrhage. *Am J Gastroenterol* 2007; 102:290.

Zakko L, Rustagi T, Douglas M, Laine L. No Benefit From Platelet Transfusion for Gastrointestinal Bleeding in Patients Taking Antiplatelet Agents. *Clin Gastroenterol Hepatol* 2017; 15:46.

Meds: Acid suppression

- ✦ Recommendation: 40mg BID IV PPI + 80mg once
- ✦ No benefit of H2 blockers
- ✦ Continuous IV infusion is equivalent to above dose
- ✦ Helps even in non – ulcer related GIB

Dorward S, Sreedharan A, Leontiadis GI, et al. Proton pump inhibitor treatment initiated prior to endoscopic diagnosis in upper gastrointestinal bleeding. *Cochrane Database Syst Rev* 2006; :CD005415.

Chan WH, Khin LW, Chung YF, et al. Randomized controlled trial of standard versus high-dose intravenous omeprazole after endoscopic therapy in high-risk patients with acute peptic ulcer bleeding. *Br J Surg* 2011; 98:640.

Meds: Prokinetic agents

- ✦ Erythromycin and Metoclopramide have been studied
 - ✦ Multiple randomized controlled trials
- ✦ Erythromycin showed benefit (single dose IV 3mg/kg)
 - ✦ Improves visibility
 - ✦ Shorter endoscopy times
 - ✦ Reduce need for repeat scope
- ✦ At least as effective as NGT or better

Altraif I, Handoo FA, Aljumah A, et al. Effect of erythromycin before endoscopy in patients presenting with variceal bleeding: a prospective, randomized, double-blind, placebo-controlled trial. Gastrointest Endosc 2011; 73:245.
Carbonell N, Pauwels A, Serfaty L, et al. Erythromycin infusion prior to endoscopy for acute upper gastrointestinal bleeding: a randomized, controlled, double-blind trial. Am J Gastroenterol 2006; 101:1211.

Meds: Other

- ✦ Somatostatin (octreotide) may reduce bleed
- ✦ Antibiotics: 20-50% with cirrhosis + GI bleed have bacterial infections
- ✦ Tranexamic acid: no good evidence for use

Bennett C, Klingenberg SL, Langholz E, Gluud LL. Tranexamic acid for upper gastrointestinal bleeding. Cochrane Database Syst Rev 2014; :CD006640.

Upper Endoscopy

- ✦ Diagnostic AND therapeutic
- ✦ Therapeutic maneuvers:
 - ✦ Injecting vasoconstrictors
 - ✦ Injecting sclerosing agents
 - ✦ Coagulation
 - ✦ Mechanical: clips or bands (variceal bleed)
- ✦ Risk of rebleeding: Forrest score

Pamela Roberts, Comprehensive Critical Care 2012

Forrest Classification

Modified Forrest Classification for Upper GI bleeding

Class	Endoscopic findings	Re-bleeding rate (%)
1a	Spurting arterial vessel	80 - 90
1b	Oozing hemorrhage	10 - 30
2a	Non-bleeding vessel	50 - 60
2b	Adherent clot	25 - 35
2c	Ulcer base with black spot sign	0 - 8
3	Clean base	0 - 12

Laine L Peterson: Bleeding Peptic Ulcer N Eng J Med 1994

Risk scores

- ✦ Rockall Score:
 - ✦ Age, shock, comorbidity, dx, stigmata of recent hemorrhage
 - ✦ Needs further validation
- ✦ Blatchford Score:
 - ✦ BUN, Hb, SBP, HR, melena, syncope, liver dz, cardiac dz
 - ✦ Score 0-23
 - ✦ Score 0 or 1 → low risk

Church NI et al. Validity of the Rockall scoring system after endoscopic therapy for bleeding peptic ulcer: a prospective cohort study. Gastrointest Endosc 2006; 63:606.
Stanley AJ, et al. Comparison of risk scoring systems for patients presenting with upper gastrointestinal bleeding: international multicentre prospective study. BMJ 2017; 356:i6432.

American Society for Gastrointestinal Endoscopy Guideline Recommendations

- ✦ Pts should be adequately resuscitated before endoscopy.
- ✦ PPIs for patients with bleeding caused by peptic ulcers.
- ✦ Prokinetic agents for patients with fresh blood or a clot
- ✦ Urgent endoscopy (within 24 hrs)
 - ✦ Hx of malignancy or cirrhosis
 - ✦ Presenting with hematemesis, hypotension, tachycardia, shock
 - ✦ Hb 8 or less

Barkun et al. Nonvariceal Upper GI Bleeding Consensus Conference Group. Consensus recommendations for managing patients with nonvariceal upper gastrointestinal bleeding. Ann Intern Med 2003; 139:843.

American Society for Gastrointestinal Endoscopy Guideline Recommendations

- ✦ Endoscopic therapy for peptic ulcers with high-risk stigmata.
- ✦ Don't do epinephrine injection alone for peptic ulcer bleeding.
- ✦ Low-risk lesions should be considered for outpatient mgmt.
- ✦ Repeat scope only if evidence of recurrent bleed exists.

Barkun et al. Nonvariceal Upper GI Bleeding Consensus Conference Group. Consensus recommendations for managing patients with nonvariceal upper gastrointestinal bleeding. Ann Intern Med 2003; 139:843.

If bleeding persists....

- ✦ Re - EGD first!
- ✦ IR if available
- ✦ Surgery required if:
 - ✦ Hemodynamically unstable
 - ✦ Excessive transfusion (e.g. 6 units in 24 hrs)

Lau et al: Endoscopic retreatment compared with surgery in patients with recurrent bleeding after initial endoscopic control of bleeding ulcers; N Eng J Med. 1999

ONCE UGIB ruled out...consider LGIB

- ✦ Diverticulosis
- ✦ Vascular
 - ✦ AVM
 - ✦ Ischemic
 - ✦ Radiation induced
- ✦ Neoplastic
- ✦ Hemorrhoids
- ✦ Iatrogenic
- ✦ **Note: About 80-85% will stop spontaneously**

Farrell JJ, Friedman LS. Review article: the management of lower gastrointestinal bleeding. Aliment Pharmacol Ther 2005; 21:1281.

LGIB: High risk features

- ✦ Hemodynamic instability
- ✦ Persistent bleed
- ✦ Significant comorbidities
- ✦ Advanced age
- ✦ **Nontender abdomen**
- ✦ **Bleeding in a hospitalized pts**
- ✦ Prior hx of bleed
- ✦ ASA use
- ✦ Prolonged PT
- ✦ Anemia
- ✦ High BUN
- ✦ High WBC

Strate LL, Orav EJ, Syngal S. Early predictors of severity in acute lower intestinal tract bleeding. Arch Intern Med 2003; 163:838.

Diagnostic Tests: Colonoscopy

- ✦ Colonoscopy: 1st choice – also therapeutic
 - ✦ Bowel prep if at all possible (4-6 L polyethylene glycol)
 - ✦ May need NGT to reduce aspiration risk

Jensen DM, Machicado GA. Diagnosis and treatment of severe hematochezia. The role of urgent colonoscopy after purge. Gastroenterology 1988; 95:1569.

Radiographic Imaging

Advantage – localizes anywhere in bowel

- ✦ Tagged rbc scan – most sensitive 0.1-0.5cc/min
 - ✦ High false positive rate (varies greatly in studies)
- ✦ CT angiography – not therapeutic
 - ✦ 0.3 – 0.5cc/min rate
 - ✦ 85% sensitive, 92% specific

Yoon W, Jeong YY, Shin SS, et al. Acute massive gastrointestinal bleeding: detection and localization with arterial phase multi-detector row helical CT. Radiology 2006; Tew K, Davies RP, Jadun CK, Kew J. MDCT of acute lower gastrointestinal bleeding. AJR Am J Roentgenol 2004; 182:427.
Pennoyer WP, Vignati PV, Cohen JL. Mesenteric angiography for lower gastrointestinal hemorrhage: are there predictors for a positive study? Dis Colon Rectum 1997; 40:1014.

Angiography

- ✦ Requires 0.5 – 1mL/min blood loss
- ✦ Choice for patients in whom endoscopy failed
- ✦ No need for bowel prep
- ✦ 1. SMA 2. IMA 3. Celiac axis
- ✦ Active bleed → embolization 80% with 97% success rate
- ✦ 20% associated ischemia

Strate LL, Naumann CR. The role of colonoscopy and radiological procedures in the management of acute lower intestinal bleeding. *Clin Gastroenterol Hepatol* 2010; 8:333.

Cohn SM, Moller BA, Zieg PM, et al. Angiography for preoperative evaluation in patients with lower gastrointestinal bleeding: are the benefits worth the risks? *Arch Surg* 1998; 133:50.

Additional Tests

- ✦ Push enteroscopy (60 cm of proximal jejunum)
- ✦ Capsule endoscopy
- ✦ Provocative challenges

ASGE TECHNOLOGY COMMITTEE, DiSario JA, Petersen BT, et al. *Enteroscopes, Gastrointest Endosc* 2007; 66:872.

Bloomfield RS, Smith TP, Schneider AM, Rockey DC. Provocative angiography in patients with gastrointestinal hemorrhage of obscure origin. *Am J Gastroenterol* 2000; 95:2807.

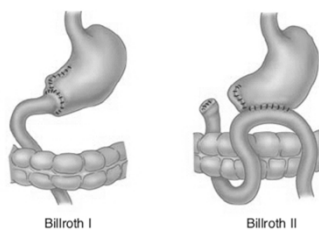
Surgical Treatment: PUD

- ✦ Gastric v Duodenal
- ✦ Gastric mandates biopsy
- ✦ Duodenal -> Erodes into gastroduodenal artery
- ✦ Surgical control: Duodenotomy followed by 3 pt ligation

PUD: Acid – suppressing Tx

- ✦ Today PPI +/- omental patch or wedge resection
- ✦ Before:
 - ✦ Partial or complete gastrectomy
 - ✦ Billroth I
 - ✦ Billroth II
 - ✦ Vagotomy to various degrees +/- pyloroplasty

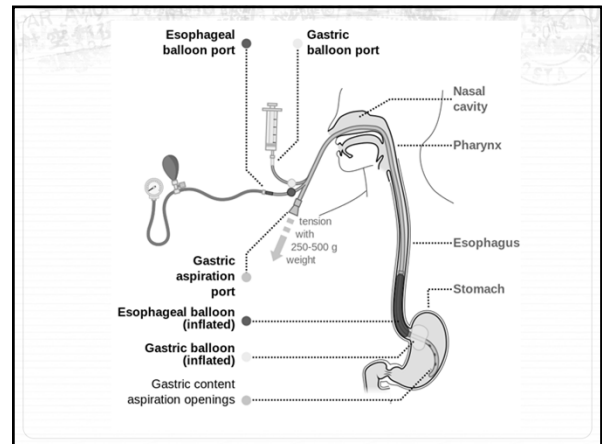
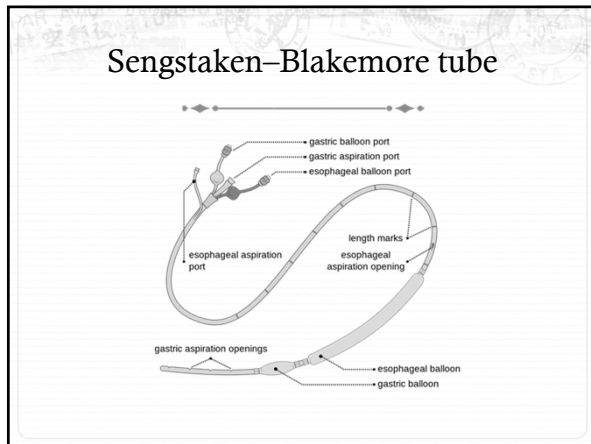
Billroth I & II



Esophageal Varices

- ✦ Pts with liver disease
- ✦ Octreotide/PPI
- ✦ EGD – banding
- ✦ TIPS
- ✦ Emergency mesocaval shunt
 - ✦ IVC – SMV (PTFE)
 - ✦ Doesn't compromise liver tp option
 - ✦ Increases risk for encephalopathy

Dimick J. Clinical Scenarios in Surgery: Decision Making and Operative Technique 2012



Case Revisited

- ✦ 79 yo M transferred from OSH with blood per rectum
- ✦ 4u pRBC 2u FFP
- ✦ Mentating, HR 90s SBP 100s on RA
- ✦ No hx of GI bleed

Case continued

- ✦ GI consulted – EGD declined due to instability
- ✦ 2 additional units of pRBC given
- ✦ SBP responds
- ✦ Now what?

Case continued

- ✦ IR called, bedside anoscopy performed
- ✦ Family discussion – surgery?
- ✦ Recent bacteremia, metastatic prostate cancer
- ✦ ?

Classic Scenarios

- ✦ POD1 s/p AAA repair
- ✦ Several months s/p roux en y gastric bypass
- ✦ AAA repair in distant past with 1 episode of bleed
- ✦ Alcoholic cirrhosis with UGI bleed
- ✦ Hep C cirrhosis with LGIB
- ✦ GI bleed in Jehova's Witness

