



EM CASES SUMMARY

Episode 101 – GI Bleed Emergencies Part 1

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How to distinguish LGIB from UGIB

Distinguishing LGIB from UGIB is not always obvious clinically.

STEP 1: Is the patient hemodynamically unstable?

As a general rule, if a patient is hemodynamically unstable, assume UGIB because UGIB is more prevalent and is associated with a higher mortality.

STEP 2: Is there bright red blood per rectum (BRBPR) with clots or hematemesis?

BRBPR with clots can be considered almost pathognomonic for a LGIB while hematemesis can be for an UGIB source.

Note that LGIB can manifest as melena and conversely, brisk upper GI bleed can manifest as hematochezia (without clots) in about 15%

of cases. Melena on history was found to have an 80% sensitivity for UGIB with a +LR = 5.9 in a large systematic review in JAMA 2012 [1].

STEP 3: Calculate the BUN: Creatinine Ratio and consider the patient's age.

The same JAMA systematic review found that a BUN:Cr ratio >30 is 93% specific for UGIB, with a +LR = 7.5. Note the units are mg/dL as used in the U.S. For other countries first divide the Creatinine by 88.42 (or roughly 100) before calculating the ratio.

Age less than 50 years has a specificity of 92% and +LR = 2.5 for UGIB source.

A study examining ED predictors of UGIB without hematemesis in 2006 found that 3 factors independently predict an UGIB source [2]:

1. Melena
2. BUN:creatinine ratio >30
3. Age < 50 years

Value of FOBT for detecting lower GI bleed emergencies

In a large population based study of asymptomatic adults out of Taiwan in 2011 the sensitivity of fecal occult blood testing for predicting a LGIB source of bleeding was only 24.3%, the specificity 89.0%, the +LR = 2.22, the -LR = 0.85 and the accuracy 73.4%.

While these were not ED patients with suspected GI bleed, the results give us a general idea of the limitations of FOBT [3].

FOBT false positives: Colchicine, iodine, boric acid, red meat

FOBT false negatives: Vitamin C

Imitators of melena

Remember the imitators of melena such as iron, bismuth and black foods like black licorice. While many patients describe their stool as black, true melena is pitch black against white paper, is of tarry consistency and has a certain putrid odour.

Airway Pearls & Pitfalls in GI bleed emergencies

Securing the airway in patients actively hemorrhaging from an UGIB is both a priority and a challenge. You may need to alter your standard approach.

- **Direct laryngoscopy** might give the best view. Video devices are easily obstructed by blood. Consider a video device equipped with a standard direct blade in case blood obstructs the camera.
- **Empty the stomach** prior to intubation with an NG tube and prokinetic agents (metocolpramide, erythromycin).
- **Lower on the induction dose** to avoid hypotension(eg 50% ketamine), **don't skimp on the paralytic** (to avoid vomiting with aspiration).
- **Pre-oxygenate** during setup *without bagging*. Bagging these patients may cause further vomiting and aspiration.

- **Decontaminate** the airway by placing the patient in *Trendelenburg* if they vomit and using a *double suction setup* including a *meconium aspirator* if available.
- Consider **SALAD** (Suction Assisted Laryngoscopy, Airway Decontamination) as described on [LITFL](#) and [EMCrit](#).
- Have "**push dose pressors**" ready in the event of sudden deterioration

Differential diagnosis of GI bleed emergencies

Lower GI Bleed

Diagnosis	Frequency	Modality
Diverticulosis	30-65%	<i>Needs a scope</i>
Ischemic colitis	5-20%	<i>Needs a CT</i>
Hemorrhoids	5-20%	<i>Needs an exam</i>
Colorectal polyps/neoplasm	2-15%	<i>Needs a scope</i>

Upper GI Bleed

Peptic Ulcer Disease (PUD) is the most common UGIB in all comers is from PUD in up to 67% of cases.

Varices should be assumed the cause of UGIB in those with evidence of liver disease. These are high pressure systems that can bleed quickly. These patients often have co-morbidities that reduce their physiologic reserve.

Aorto-enteric fistulae cause rapid and severe bleeding that is rarely indolent. Look for surgical scars. These patients die quickly.

Initial fluid management in massive GI bleed emergencies

Avoid excessive crystalloid resuscitation. While there is no literature to guide us specifically in this patient population a general rule of thumb is that hemodynamically unstable bleeding patients need blood products. Practically speaking, there are often delays in obtaining blood products, so our experts recommend giving a minimum amount of fluid to maintain **MAP > 60 mm Hg**.

Transfusion management in GI bleed emergencies

General principles of transfusion management in GI bleed emergencies

Hemodynamic instability: Transfuse regardless of hemoglobin level

Shock index: A shock index (HR/SBP) of >1 should trigger consideration for massive transfusion

Don't trust the Hb: Hemoglobin often lags behind bleeding, so trend it by repeating the hemoglobin in an hour or two.

Consider clinical factors: Presyncopal patient, high volume blood loss or brisk bleeding should trigger consideration for red cell transfusion.

Be flexible: Lower your threshold to transfuse in patients with co-morbidities such as coronary artery disease or coagulopathy.

Most GI bleed patients can tolerate low hemoglobins: Stable patients with a chronic GI bleed of small volume can generally tolerate low hemoglobins.

Portal bleeding: Restitution of blood volume may be associated with recurrence of portal bleeding.

While there is no specific literature for hemoglobin transfusion thresholds for LGIB a landmark study out of NEJM in 2013 in patients with *stable* UGIB suggested that a hemoglobin threshold of 7 for red cell transfusion [6].

Stable UGIB patients in the liberal transfusion arm (Hb<9) had increased bleeding, higher mortality, increased need for surgery and increased length of stay when compared to the restricted transfusion group (Hb<7). Note that this study was conducted in a highly controlled environment with rapid access to endoscopy and therefore, may not be applicable to resource-limited settings.

Indications for Massive Transfusion Protocol in GI bleed emergencies

GI bleed patients bleed differently compared to trauma patients. GI bleeds do not impart the same hyperfibrinolysis of that of a trauma bleed and so do not require as much coagulation support. A close look at the TRIGGER Study [7] out of the UK, reveals that only 5% of variceal bleeds require a massive transfusion protocol. In other words, 95% of GI bleed patients require only red cell transfusions. Over-activation of massive transfusion protocols lead to unnecessary complications such as Transfusion Associated Circulatory Overload (TACO) and wasted blood products. The following are Jeannie Callum's recommendations for when to trigger a Massive Transfusion Protocol and what tests to order.

Indications for MTP in UGIB
Profoundly hypotensive patients with brisk bleeds that preclude relying on real-time guidance from lab test
Shock index > 1
No response to initial resuscitation of 4 units red cells
Use of more than 4 units red cells/hour

Tests to order during an MTP
CBC- for platelet count
INR – if lower than 1.8 in a liver disease patient, assume preserved coagulation. Plasma may be given if INR higher than 1.8, however the benefit is unclear
PTT – Helps identify those on NOACs
Fibrinogen – To assess need for cryoprecipitate
TEG and ROTEM are adjunct tests that can help guide resuscitation

Pitfall: Administering plasma for liver patients with an elevated INR. Patients with liver disease and high INRs are not at the same bleeding risk as those on Warfarin and have high INRs. They will therefore not require the same plasma therapy.

Jeannie Callum's 7 T's for Massive Transfusion Protocol (MTP)

Trigger: Know when, know how to activate your local MTP.

Team: Ensure the lab, nurses, and required consulting services (ICU, hematology) are notified early.

Testing: Q1H labs (don't forget the fibrinogen level!)

TXA: Most patients receiving massive transfusion will require TXA as well.

Temperature: Maintain body temperature >36. Each degree lower worsens bleeding.

Transfuse to target hemoglobin: Start with 4 units uncrossmatched.

Termination: Know when to stop an MTP based on hemodynamics and hemoglobin level and redirect blood products back to the blood bank for use in other acute patients.

Pitfall: Forgetting to order fibrinogen level in patients requiring massive transfusion. An initial fibrinogen is essential to help assess the need for cryoprecipitate administration in the massive GI bleeder.

Platelet replacement for patients on anti-platelet agents

Though intuitive that replacing platelets for those on medications that inhibit platelet function, studies such as the PATCH Trial for intracranial hemorrhage [8] have found that there is an increased risk of death and length of hospitalization due to associated thrombo-embolic. As such, platelet replacement therapy should probably be avoided in GI bleed patients who are taking anti-platelet agents.

Is a Nasogastric (NG) tube required in GI bleed emergencies?

Therapeutic NG: Expert opinion recommends placing an NG tube in order to empty the stomach to optimize ETT placement and endoscopy visualization as well as to minimize the chances of hematemesis with aspiration in UGIB patients.

Diagnostic NG: Aspirate to help localize the bleeding source. This is controversial.

A retrospective study in 2004 [2] revealed a +LR \approx 11 for detecting an UGIB if the NG aspirate was bloody. However, the -LR = 0.6. Diagnostic if you see blood but not reassuring if you don't see blood. A systematic review in 2010 showed an overall sensitivity ranging from 42% to 84% [9]. There is a high false negative rate due to intermittent bleeding or duodenal bleeding.

It is important to recognize that NG tube placement is one of the most painful procedures in emergency medicine [10].

Timing and location of endoscopy

Based on a 2016 systematic review of 12,000 patients [11] endoscopy within 6-24 hours of presentation has a lower in-hospital mortality compared with endoscopy outside this time frame for all patients except those that are stable with an American Society of Anesthesiologist (ASA) score of 1-2.

For unstable patients, the sooner the better, but don't forget to "resuscitate before you endoscope" as patients who are not fully resuscitated prior to endoscopy are at high risk of crashing during endoscopy.

The location of endoscopy depends on several factors. Hemodynamically unstable patients, those with active hematemesis and those with ongoing resuscitation should be scoped in the ED.

"Resuscitate before you endoscope"

What is the next step if the culprit lesion cannot be found on endoscopy?

The next step after a failed endoscopy depends on how stable the patient is. For unstable patients a rapid surgical and interventional radiology consult is paramount. For stable patients, CT angiography can be valuable in locating the source of bleeding.

Goals of resuscitation for massive GI bleed

There is little data to guide our resuscitation in this patient population. Extrapolating from trauma literature, there are a few goals recommended by Dr. Callum:

Consider 1:1:1 blood product resuscitation
Early airway management
Hemoglobin > 70 g/L
Platelets > 50 x 10 ⁹ /L
INR < 1.5-2.0
Fibrinogen > 1 g/L (severe hemorrhage) or > 2 g/L (extreme)
Calcium > 2.0 mmol/L
Lactate < 2 mmol/L
Base deficit < 3 mmol/L
Temp between 36.0-37.5 °C

Should Tranexamic Acid (TXA) be given for all patients with GI Bleed?

Our experts recommend administering TXA for all *hemodynamically unstable* GI bleed patients who do not have specific contraindications (see below).

For UGIB patients there is moderate evidence for improved survival with TXA based on a 2014 systematic review [13]. A 2012 Cochrane review showed no significant difference in bleeding, surgery, or transfusion requirements although there was a trend toward reduction in bleeding and mortality [14]. Overall, there are insufficient data on the effectiveness and safety of TXA use in all-comers with UGIBs. HALT-IT is a large multi-center study in progress looking to assess the impact of TXA on UGIB morbidity and mortality [15]. For LGIB there is no evidence for benefit or harm.

Contraindications to tranexamic acid

- History of coronary stent(s)
- History of active hematuria (it is thought that administration of TXA in the patient with hematuria may cause a clot resulting in obstructive uropathy)
- History of venous thromboembolic disease

In Part 2 of our series on GI bleed we discuss the evidence for PPI, prokinetic agents, somatostatin analogues such as octreotide, risk assessment, disposition and more.

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