

Emergency - Upper gastrointestinal haemorrhage

Definitions in upper gastrointestinal (UGI) haemorrhage

- UGI haemorrhage: bleeding that arises proximal to the ligament of Treitz i.e. from the oesophagus, stomach or duodenum
- Haematemesis: vomiting of blood from the UGI tract
- Coffee-ground vomit: vomiting of dark brown granular matter presumed to be digested blood
- Melaena: passage of black, tarry stools presumed to be digested blood from the UGI tract
- Haematochezia: passage of blood per rectum usually due to a LGI haemorrhage but occasionally due to an UGI haemorrhage with rapid transit time

Aetiology of UGI haemorrhage

- Oesophagus
 - Oesophageal varices
 - Oesophagitis
 - Oesophageal carcinoma
 - Mallory-Weiss tear
- Stomach
 - Gastric ulcer
 - Gastritis
 - Gastric carcinoma
- Duodenum
 - Duodenal ulcer
 - Duodenitis
- Other
 - Thrombocytopenia
 - Coagulopathy
 - Aorto-enteric fistula

Pathophysiology of UGI haemorrhage

- The commonest cause of UGI haemorrhage is peptic ulcer disease, which may occur in the stomach (gastric ulcer) or duodenum (duodenal ulcer)
- Peptic ulcer disease is commonly due to infection with *Helicobacter pylori* and/or non-steroidal anti-inflammatory drug (NSAID) use
 - *Helicobacter pylori* directly disrupts the mucosal barrier and causes inflammation of the gastric and duodenal mucosa
 - NSAIDs inhibit the enzyme cyclo-oxygenase, reducing the synthesis of prostaglandins which are responsible for stimulating alkaline mucus secretion, thereby exposing the UGI mucosa to damage from gastric acid
- Oesophageal varices are dilated porto-systemic anastomotic veins that occur due to portal hypertension secondary to chronic liver disease

History in UGI haemorrhage

- Haematemesis
 - If so what volume? Enough to fill a cup? A bowl? A saucepan?
- Coffee-ground vomiting (volume?)
- Melaena (volume?)
- Haematochezia (volume?)

- Abdominal pain
- Malignancy red flags
 - Cachexia
 - Anorexia
 - Night sweats
 - Dysphagia
 - Dyspnoea
- Severity assessment
 - Light-headedness
 - Loss of consciousness
- Causes assessment
 - Chronic liver disease
 - Alcohol misuse
 - NSAIDs or steroids
 - Warfarin
- Past medical history
 - Previous GI bleed
 - Known PUD/varices
 - Malignancy
 - Liver disease
 - Known cardiovascular/respiratory disease (fitness to undergo sedation and/or intubation for endoscopy)

Examination in UGI haemorrhage

- Airway
 - May be compromised by reduced conscious level
- Breathing
 - Kussmaul's breathing: hyperventilation to compensate for metabolic acidosis manifesting as 'air hunger'
- Circulation
 - Cold, pale peripheries
 - Prolonged capillary refill times (CRT >2 s)
 - Decreased skin turgor
 - Reduced jugular venous pressure (JVP)
 - Sunken eyes
 - Dry lips, mouth and tongue
 - Tachycardia
 - Postural hypotension
 - Absolute hypotension
- Disability
 - Confusion
 - Reduced conscious level
- Exposure
 - Abdominal examination
 - Guarding/rigidity
 - Masses
 - Per rectum (PR) examination to look for melaena or haematochezia
 - Signs of chronic liver disease
 - Jaundice, ascites
 - Hands: clubbing, Dupuytren's contracture, palmar erythema
 - Spider naevi

- Gynaecomastia
- Portal hypertension: splenomegaly and caput medusae
- Encephalopathy

Risk stratification of UGI haemorrhage (pre-endoscopy Rockall score)

- Age
 - <60 years (0)
 - 60-79 years (1)
 - ≥80 years (2)
- Shock
 - No shock ie heart rate (HR) <100 bpm & systolic blood pressure (SBP) >100 mmHg (0)
 - Tachycardia ie HR >100 bpm & SBP >100 mmHg (1)
 - Hypotension ie HR >100 bpm & SBP <100 mmHg (2)
- Co-morbidity
 - No major co-morbidity (0)
 - Cardiac failure, ischaemic heart disease (2)
 - Renal failure, hepatic failure, disseminated malignancy (3)
- A score of zero is associated with a predicted mortality of 0.2%
- A score of seven is associated with a predicted mortality of 50%
- Only patients with a Rockall score of zero can be safely managed as an outpatient; consider for discharge and outpatient follow-up if:
 - Age <60 years and
 - No evidence of haemodynamic instability and
 - No significant co-morbidity and
 - No witnessed haematemesis or haematochezia
- Rockall score ≥1 should not be discharged; consider for admission and early UGI endoscopy if:
 - Age >60 years or
 - Haemodynamic instability or
 - Known chronic liver disease or
 - Witnessed haematemesis or haematochezia

Initial investigation of UGI haemorrhage

- Venous blood gas (VBG) looking for a lactic acidosis indicative of shock
- Full blood count (FBC): anaemia may not be apparent initially after acute haemorrhage
- Urea & electrolytes (U&Es): deamination of amino acids from digestion of blood proteins may lead to disproportionately elevated urea
- Liver function tests (LFTs)
- Coagulation
- Cross-match
- Erect chest radiograph (CXR) looking for pneumoperitoneum indicative of bowel perforation

Further investigation of UGI haemorrhage

- UGI endoscopy is the definitive investigation and management
- *Helicobacter pylori* testing for those with peptic ulcer disease

Initial management of UGI haemorrhage

- Assess the patient from an ABCDE perspective

- Maintain a patent airway: use manoeuvres, adjuncts, supraglottic or definitive airways as indicated and suction any sputum or secretions
- Deliver high flow oxygen 15L/min via reservoir mask and titrate to achieve oxygen saturations (S_pO_2) 94-98% or 88-92% if known to have COPD
- Attach monitoring
 - Pulse oximetry
 - Non-invasive blood pressure
 - Three-lead cardiac monitoring
- Request 12 lead ECG and portable CXR
- Obtain intravenous (IV) access and take bloods and VBG
- Fluid resuscitation
 - Guided by clinical context
 - Treat shock aggressively
 - Give boluses of crystalloid 250-500 ml IV and re-assess after each
 - Aim for permissive hypotension so as not to disrupt any clots that have formed or are in the process of forming
 - Shock refractory to fluid resuscitation should be considered for referral to critical care for insertion of arterial and central lines and vasoactive drug therapy (vasopressors and/or inotropes)
 - Transfusion
 - Be aware that anaemia from haemorrhage will not be apparent initially and will be exacerbated by crystalloid fluid resuscitation
 - Once $\geq 30\%$ of circulating volume is lost, red transfusion should be initiated, ideally with fully cross-match blood, or with type specific or even group O rhesus negative (O negative) in an emergency. A trigger of $Hb < 8$ if often used
 - In variceal bleeding, a transfusion trigger of 7 is reasonable
 - Transfusion with additional products such as platelets, fresh frozen plasma, cryoprecipitate may be necessary
 - Activate the major haemorrhage protocol if necessary
 - Give PCC to anyone actively bleeding on warfarin
- Catheter to monitor fluid balance
- Antibiotics
 - Give broad spectrum antibiotics e.g. co-amoxiclav 1.2g TDS iv or tazocin 4.5g iv TDS to all patients with UGI haemorrhage and chronic liver disease. This has been shown to have a significant reduction on mortality
- Terlipressin
 - Give terlipressin 2g iv to all patients with suspected variceal haemorrhage prior to UGI endoscopy
 - It acts as a splanchnic vasoconstrictor, reducing portal hypertension and the degree of variceal haemorrhage
 - Contraindicated in patients with cardiovascular disease due to the risk of ischaemia: must have non-ishaemic ECG and be intravascularly replete prior to giving
- Prokinetic
 - Metoclopramide 10mg IV can be given to empty the stomach contents to allow better views at endoscopy
- UGI endoscopy
 - UGI endoscopy is the definitive investigation and management
 - Techniques include band ligation, clipping, injections of sclerosants and thermal coagulation
 - Timing depends on pre-endoscopy Rockall score and clinical context; if the patient is unstable and/or has active bleeding then UGI endoscopy should be performed once resuscitation has taken place
 - If immediate UGI endoscopy is unnecessary, it should be performed within 24 hours

- If UGI endoscopy fails to control haemorrhage, arterial embolisation or surgery may be required; the treatment of choice for uncontrolled variceal haemorrhage is transjugular intrahepatic portosystemic shunting (TIPS)
- Proton pump inhibitors (PPIs)
 - Current NICE guidance is NOT to give acid-suppression (PPIs, H2-RA) to patients with suspected non-variceal bleeds prior to endoscopy).
 - IV PPIs eg omeprazole 40 mg IV should be given following UGI endoscopy in patients found to have peptic ulcer disease
 - In practice however, this is still commonly given prior to endoscopy

Further management of UGI haemorrhage

- Sengstaken-Blakemore tube
 - In torrential UGI haemorrhage secondary to oesophageal varices consider balloon tamponade via insertion of a Sengstaken-Blakemore tube
 - The tube is inserted down the oesophagus, the gastric balloon inflated, then pulled back to occlude the gastro-oesophageal junction
 - The oesophageal balloon is then inflated to tamponade oesophageal varices
- Stop aspirin, NSAIDs and anticoagulants
- Warfarin may need urgent reversal depending on the international normalised ration (INR)
- Eradication therapy for those who test positive for *Helicobacter pylori*

Common questions concerning UGI haemorrhage:

- Define the term UGI haemorrhage in terms of its source of origin
 - Bleeding that arises proximal to the ligament of Treitz i.e. from the oesophagus, stomach or duodenum
- List the two main causes of UGI haemorrhage
 - Peptic ulcer disease
 - Oesophageal varices
- List the signs of chronic liver disease that you would look for in a patient with UGI haemorrhage
 - Clubbing
 - Dupuytren's contracture
 - Palmar erythema
 - Jaundice
 - Spider naevi
 - Gynaecomastia
 - Ascites
 - Splenomegaly
 - Caput medusa
 - Testicular atrophy
- What tool is used to risk stratify patients with UGI haemorrhage?
 - Pre-endoscopy Rockall score
- List the three components of this risk stratification tool
 - Age
 - Shock
 - Co-morbidities
- What is the definitive investigation and management of UGI haemorrhage?
 - UGI endoscopy
- What pharmacological components are there to managing UGI haemorrhage?
 - Fluid resuscitation
 - Antibiotics

- Terlipressin
- PPI IV post-endoscopy
- What non-pharmacological procedure may be life-saving in torrential UGI haemorrhage due to oesophageal varices?
 - Sengstaken-Blakemore tube