UPPER GI BLEEDING, PUD, VARICES & GIST

PRESENTER: DR G SHAMHUYASHE

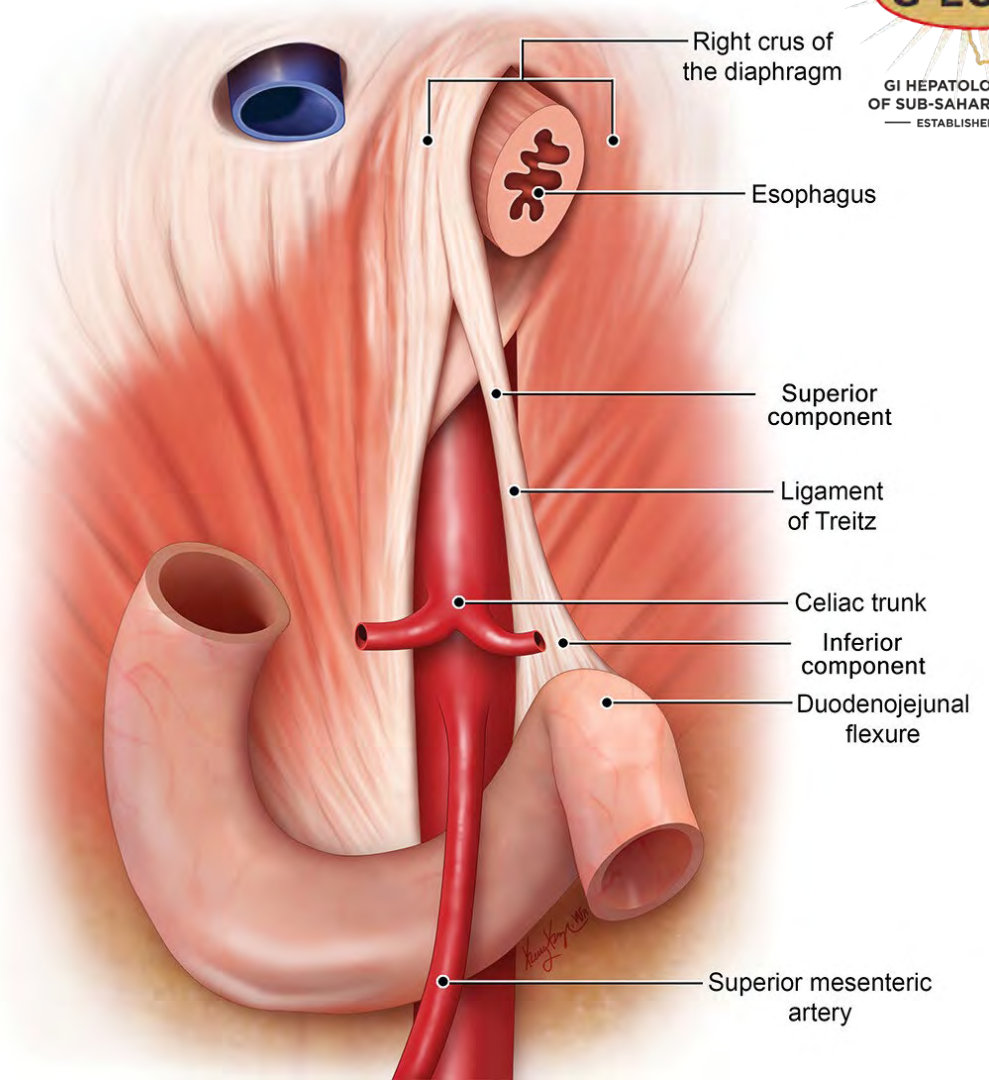
FACILITATOR: DR N RAMONATE

OUTLINE

- Definition
- Pre endoscopic assessment
- PUD
- Endoscopic management
- Variceal Bleeding
- GISTs

UPPER GI BLEEDING

- **DEFINITION**
- Bleeding originating proximal to the ligament of Trietz (duodenojejunal flexure) in 85% cases
- May be acute or chronic, slow or brisk, obscure or overt, depending on the underlying etiology, bleeding rate, and chronicity of blood loss



CLASSIFICATION

- **Non-Variceal**

-Peptic ulcer disease

-Erosive gastritis/duodenitis

-Mallory-Weiss Tear

- Dielafoy lesion

-Malignancy

-Angiodysplasia

-Esophagitis

- **Variceal**

-Esophageal varices

-Gastric varices

-Portal hypertensive gastropathy

-GAVE

ETIOLOGY OF NVUGIB

Peptic Ulcer disease	35-50%
Erosive gastritis/Duodenitis	10-15%
Variceal/Portal hypertension	5-20%
Esophagitis	5-10%
Mallory –Weiss tear	5-10%
Malignancy	3-5%
Vascular malformations	3%
Dielafoy lesion	1-2%
Post EMR/ESD bleeding	1%

Laine et al. Am J Gastroenterol 2021;116:899–917

Key History

- **HPC**
  - -Duration of bleeding
  - -Frequency/amount/type of bleeding
  - -Stool color
  - -Associated GI symptoms: Abdominal pains, dysphagia etc
  - -Orthostatic symptoms, dyspnoea, chest pains
  - -Any previous GI bleed?
- **Comorbidties**
  - -Liver disease/cirrhosis
  - -Coagulopathy
  - -Cardiopulmonary disease
- **Meds/Substances**
  - -ASA,NSAIDs
  - -Antiplatelets, anticoagulants
  - -PPI
  - -Alcohol, smoking
- **Procedural History**
  - -Surgery
  - -Endoscopy
  - -Radiation
- **Pre-procedure Questions**
  - -Last NPO?
  - -Consentable?

CLINICAL MANIFESTATION

- GI manifestations include hematemesis, coffee-ground emesis, hematochezia, or melena
- Patients may also experience systemic symptoms such as syncope, fatigue, palpitations, exertional dyspnea,or weakness.
- Timely triage, early resuscitation, and endoscopic evaluation are critical to improving outcomes for patients with upper GI bleeding

RISK FACTORS

- Peptic Ulcer Disease
- NSAIDs/ASA
- H pylori infection
- Tobacco smoking
- Steroids and ETOH are not independent risk factors
- Psychological stress
- Stress Ulcers: Intubation > 48hrs, Increase intracranial pressure, Burns >35% TBSA
- Esophagitis: Supine position
- Mallory Weiss Tears: after wretching
- Varices: Risks for liver disease or portal HPT

Risk stratification

- **Pre-endoscopy scoring systems for nonvariceal bleeding include:**
  -The Blatchford Score,
  -The Clinical Rockall Score,
  -Artificial neural network score,
  -The AIMS65 score
  -Harbinger Score
- **The post-endoscopy scoring system:**
  - The Complete Rockall Score
  - The Baylor Scoring System
  - The Cedars-Sinai Bleeding Index
  - Better at predicting mortality than rebleeding

Glasgow Blatchford Score

- Need for intervention or not
- Score 0.1-Low risk(No need for hospitalisation, outpatient Tx)
- Score >1: High risk and hemodynamically unstable (hospitalisation and inpatient management)

Table 2. Glasgow-Blatchford score

Risk factors at admission	Factor score
Blood urea nitrogen (mg/dL)	
18.2 to <22.4	2
22.4 to <28.0	3
28.0 to <70.0	4
≥70.0	6
Hemoglobin (g/dL)	
12.0 to <13.0 (men); 10.0 to <12.0 (women)	1
10.0 to <12.0 (men)	3
<10.0	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
<90	3
Heart rate (beats per minute)	
≥100	1
Melena	1
Syncope	2
Hepatic disease[a]	2
Cardiac failure[a]	2

[a]Hepatic disease and cardiac failure were not defined in the original report of the Glasgow-Blatchford score. One more recent study defined hepatic disease as known history, or clinical and laboratory evidence, of chronic or acute liver disease and cardiac failure as known history, or clinical and echocardiographic evidence, of cardiac failure (6).

Rockall Score

- **Preendoscopic** (estimate mortality)
- **Endoscopic**

-No lesion

-Lesion found(MW, malignancy, bleeding ulcer)

The Rockall Scoring System

Variables	Responses	Scores
Age (in years)	< 60	0
	60-79	1
	>80	2
Shock	No shock	0
	Tachycardia (SBP > 100 mmHg, Pulse > 100 beats/minute)	1
	Hypotension (SBP < 100 mmHg, Pulse > 100 beats/minute)	2
Co-morbidity	None	0
	Cardiac failure, IHD, any major co-morbidity	2
	Renal/liver failure, metastatic malignancy	3
Diagnosis (post-endoscopy)	Mallory-Weiss tears	0
	All other diagnoses	1
	Malignancy of the upper GI tract	2

RESUSCITATION

- Closely monitor airway, clinical status, vital signs, cardiac rhythm, urine output: Stable vs Unstable
- Examine pt including PR
- Trendelenburg position(head down)
- Large bore iv lines >> PICC lines
- Bloods: FBC, CMP, U&E, Creat, LFTs, PT/INR/ PTT. Type and crossmatch
- Restrictive vs Aggressive fluid resuscitation- colloid/crystalloids
- Restrictive red blood cell transfusion strategy
  - Target HB: 7-9g/dl. (≥10g/dl for active CAD)
- Risk Stratification: High risk vs low risk
  - Pt triage(ICU, inpatient, outpatient)
  - Timing of endoscopy
- Consult appropriate colleagues: ICU, IR, Surgery

WHEN TO INTUBATE?
Prophylactic ET intubation in UGI Bleeds

- **Indications**

-Massive hematemesis

-Altered mental status

-Airway protection

- **Considerations**

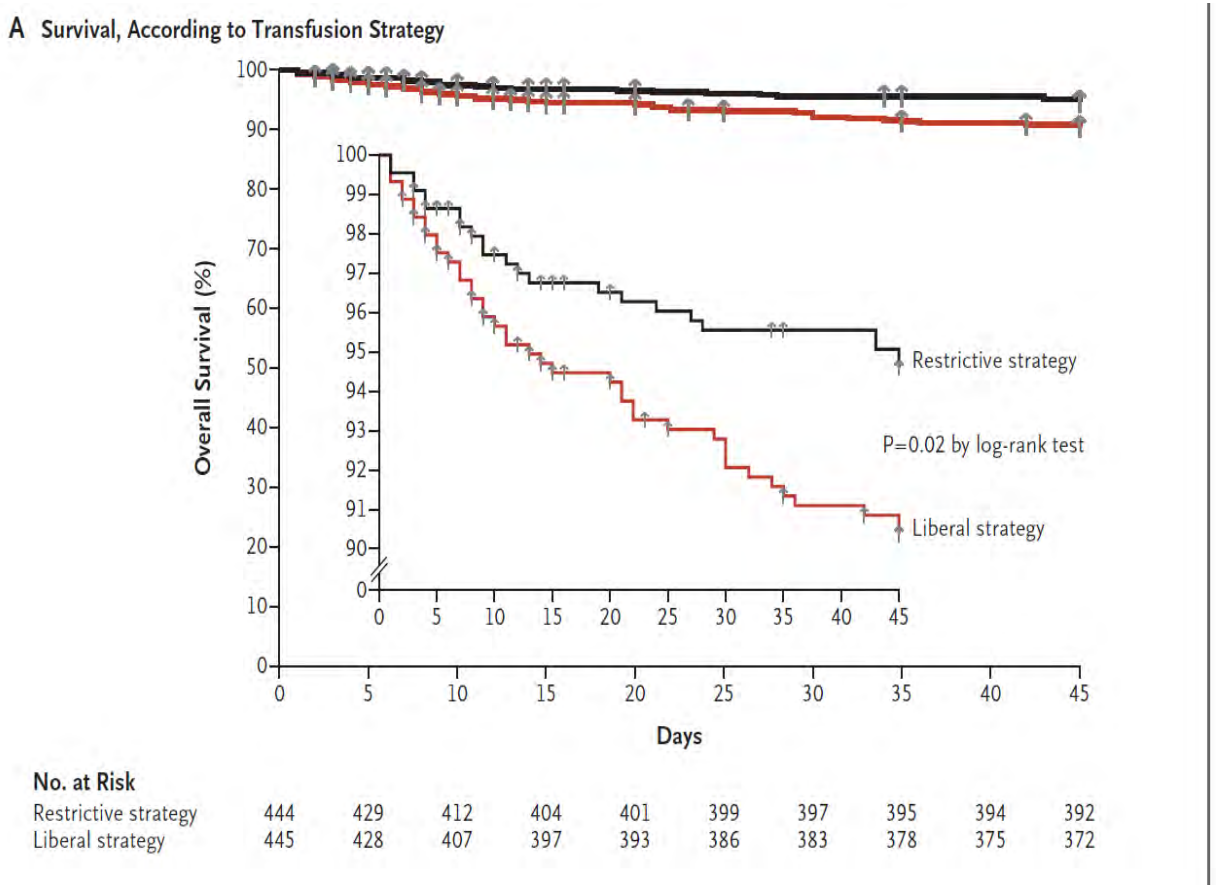
- Potential risk of aspiration pneumonia
- Potential risk of cardiac adverse events(shock)

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 JANUARY 3, 2013 VOL. 368 NO. 1

Transfusion Strategies for Acute Upper Gastrointestinal Bleeding

Càndid Villanueva, M.D., Alan Colomo, M.D., Alba Bosch, M.D., Mar Concepción, M.D.,

- Enrolled 921 pts with severe acute UGIB and randomly assigned 461 of them to a restrictive strategy (Tf when the Hb < 7 g /dl) and 460 to a liberal strategy (transfusion when the Hb fell below 9 g/dl).
- Probability of survival at 6 weeks was higher in the restrictive-strategy group than in the liberal-strategy group (95% vs. 91%; HR for death with restrictive strategy, 0.55; 95%.CI- 0.33 to 0.92; P = 0.02)
- Further bleeding occurred in 10% of the patients in the restrictive-strategy group as compared with 16% of the patients in the liberal-strategy group (P=0.01)
- Adverse events occurred in 40% as compared with 48% (P = 0.02).
- As compared with a liberal transfusion strategy, a restrictive strategy significantly improved outcomes in patients with acute UGIB



Pre Endoscopic Prokinetic Agents

- **Pre-endoscopic Erythromycin**

- 250mg iv, 20-90minutes before endoscopy: **ACG Guidelines 2021**
- Adequate gastric mucosal visualisation
- Need for second-look endoscopy reduced
- Length of hospital stay reduced

- Limited data on metochlopromide

Benefits of PPI use before Endoscopy

- ASGE guidelines recommend iv PPI before endoscopy
- ACG 2021 Guidelines no longer reach consensus on pre-endoscopic PPI use
- **Dosage**: 80mg iv bolus x1 followed by8mg/hr iv for 72hrs
- Rebleeding rates reduced, need for surgery reduced,
- Iv PPI is also recommended to decrease further bleeding if endoscopy is delayed or cannot be performed

CLINICAL PREDICTORS OF POOR OUTCOME

- Age > 60 years
- Comorbid diseases
- Red blood hematemesis or NG aspirate
- Persistent Hypotension
- Packed Red blood Cell Transfusion of > 6 units
- Inpatient status at time of bleeding
- Coagulopathy

TIMING OF ENDOSCOPY

- Post hemodynamic resuscitation, multi-society guidelines recommend early (≤24hours) EGD
- Very early (<12hrs) EGD may be considered in patients with;

-Haemodynamic instability refractory to resuscitation

- Frank hematemesis or NG aspirate

- Contraindications to the interruption of anticoagulation

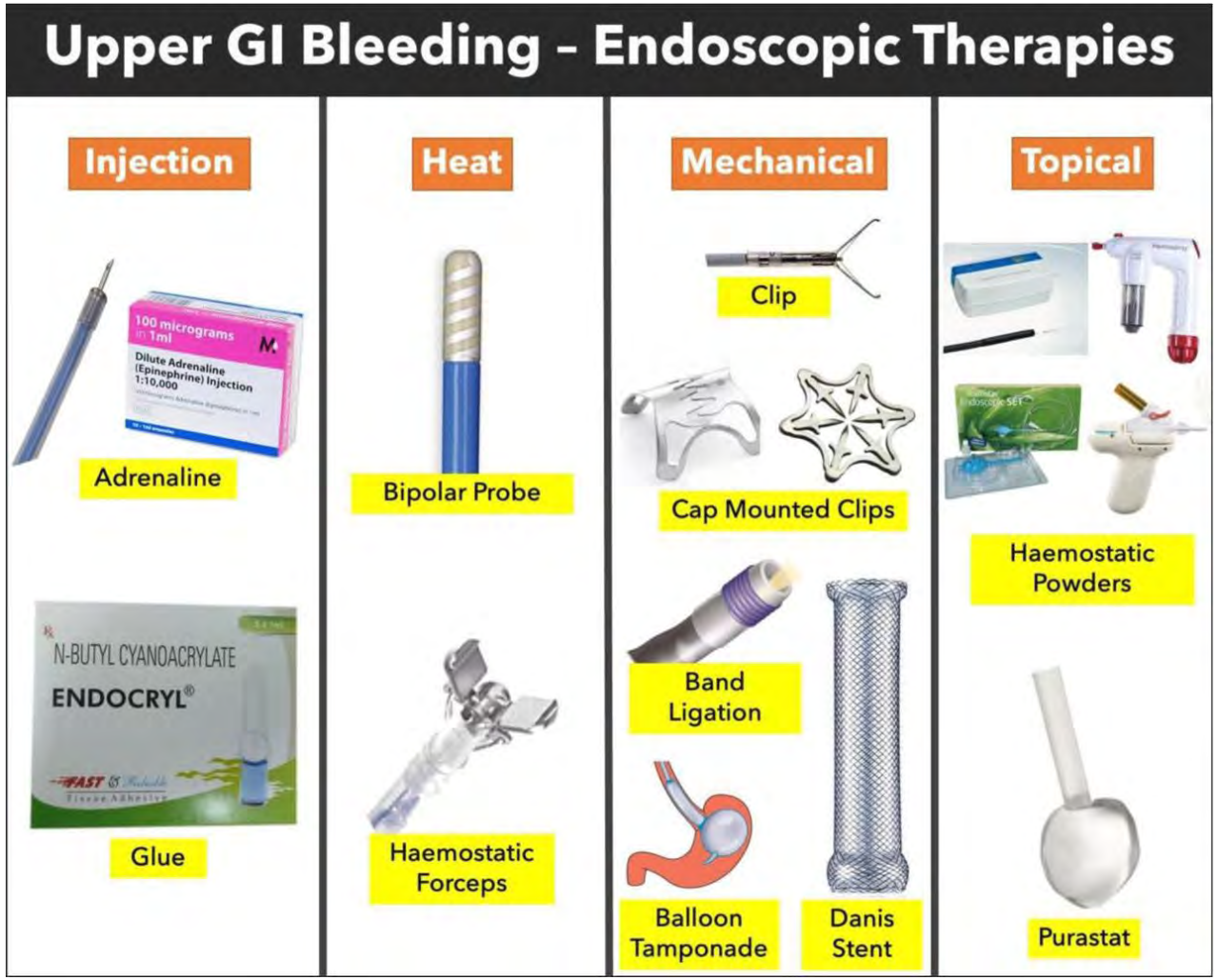
- Emergent endoscopy(<6hours) is associated with worse outcomes

- Likely under-resuscitation and insufficient time on PPI IV to stabilise the clot

James Y W et al. N Engl J Med 2020;382:1299-308.

ENDOSCOPIC TOOLBOX

- Immediate access to multiple devices
- Directly improves outcomes
- Ability to tailor therapy
- Improves primary hemostasis rates
- Reduced rebleeding rates
- Decreased need for repeat endoscopy or surgery
- Enhanced procedural efficiency



PEPTIC ULCER BLEEDING

BOX 20.1 Factors Predictive of a Poor Prognosis After Hemorrhage From Peptic Ulcer

- Age >60 years
- Bleeding onset in hospital
- Severe comorbid medical illness
- Shock or orthostatic hypotension
- Fresh blood in NG tube
- Coagulopathy
- Multiple transfusions required
- Higher lesser curve gastric ulcer (adjacent to left gastric artery)
- Posterior duodenal bulb ulcer (adjacent to gastroduodenal artery)
- Endoscopic finding of arterial bleeding or visible vessel
- Residual arterial blood flow after endoscopic treatment

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Forrest Classification

Stage	Characteristics	Re-bleeding
Ia	Spurting Bleed	60 - 100 %
Ib	Oozing Bleed	50%
IIa	Non-Bleeding Visible Vessel	40 - 50 %
IIb	Adherent Clot	20 - 30 %
IIc	Flat Spot in ulcer crater	7 - 10 %
III	Clean Base Ulcer	3 -5 %

Ia	Ib	IIa	IIb	IIc	III
Spurting bleed	Oozing bleed	Non-bleeding visible vessel	Adherent clot	Flat spot in ulcer crater	Clean base ulcer

Forrest classification and management of peptic ulcer bleeding

Stigmata	Forrest classification	Management
Active bleeding		
• **Arterial, spurting hemorrhage**	Ia	Dual endoscopic therapy* + IV PPI for 72 hours
• **Oozing hemorrhage**	Ib	
Recent hemorrhage		
• **Visible vessel**	IIa	Dual Endoscopic therapy* + IV PPI for 72 hours
• **Adherent clot**  Video 7-1	IIb	• Aggressive irrigation or suction to expose and treat the underlying lesion (video 7-1) • Consider removing the clot with a snare. • If the clot cannot be removed, consider epinephrine injection in high-risk patients • Give intensive PPI therapy post EGD (IV drip or b.i.d. PPI)
• **Flat pigmented spot**	IIC	No endoscopic therapy. PO PPI
Lesions without active bleeding		
• **Clean base**	III	No endoscopic therapy. PO PPI
*Dual endoscopic therapy: epinephrine injection plus thermocoagulation or endoclips		

ENDOSCOPIC MANAGEMENT

- **Injection:**

-Adrenaline

- Sclerosant: absolute ethanol, Ethanolamine, STD, polidoconol, histoacryl glue(gastric varices)
- Thrombin, fibrin

- **Thermal:**

-Contact: BICAP, Gold Probe, Heater probe

-Non contact: APC , Laser

- **Mechanical:**

-Clips

-Banding

- **Hemostatic Powder sprays, Purastat**
- **Others**: Stents

RISK FACTORS FOR FAILURE

-Large ulcer > 2cm

-Posterior duodenal bulb location

-Forrest 1a/1b

-Hemodynamic instability

-Coagulopathy/anticoagulation

ADRENALINE

- For non-variceal UGIB and not for use as monotherapy
- Causes vasoconstriction and tamponade
- Usual dilution 1: 10 000, 0.5-2mls aliquots
- Volume:

-Large volume(>13mls) better than low volume(5-10mls) for reducing recurrent bleed in high-risk PUD (Lin 2002)

-Injection of 30 mL diluted epinephrine can effectively prevent recurrent bleeding with a low rate of complications (Liou 2006)

PO Box 2345, Beijing 100023, China
www.wjgnet.com
wjg@wjgnet.com

World J Gastroenterol 2006 May 21; 12(19): 3108-3113
World Journal of Gastroenterology ISSN 1007-9327

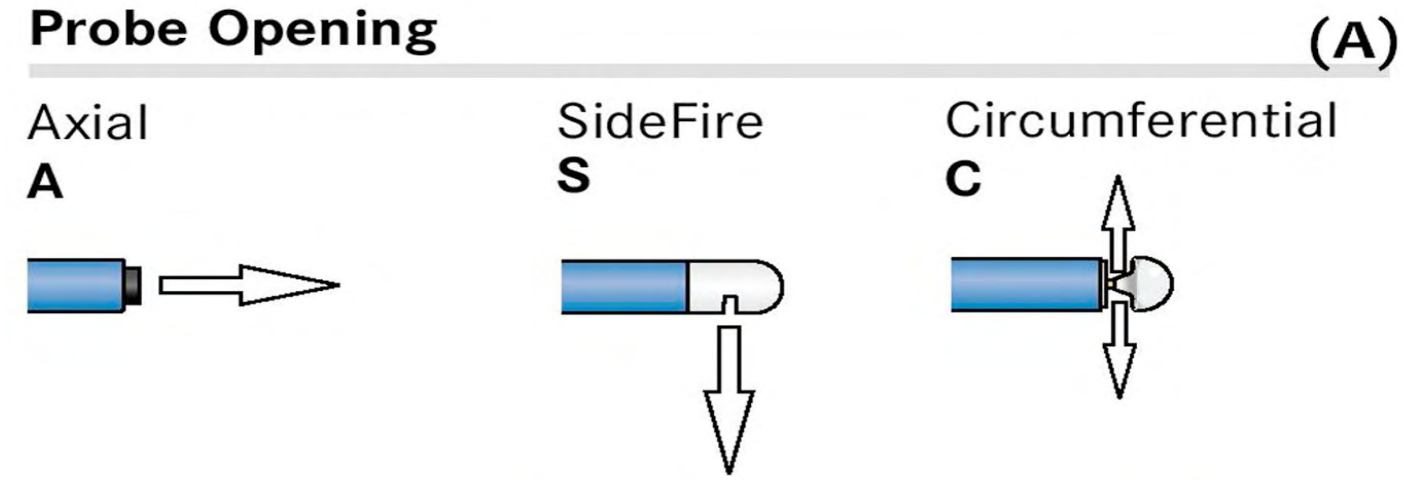
RAPID COMMUNICATION

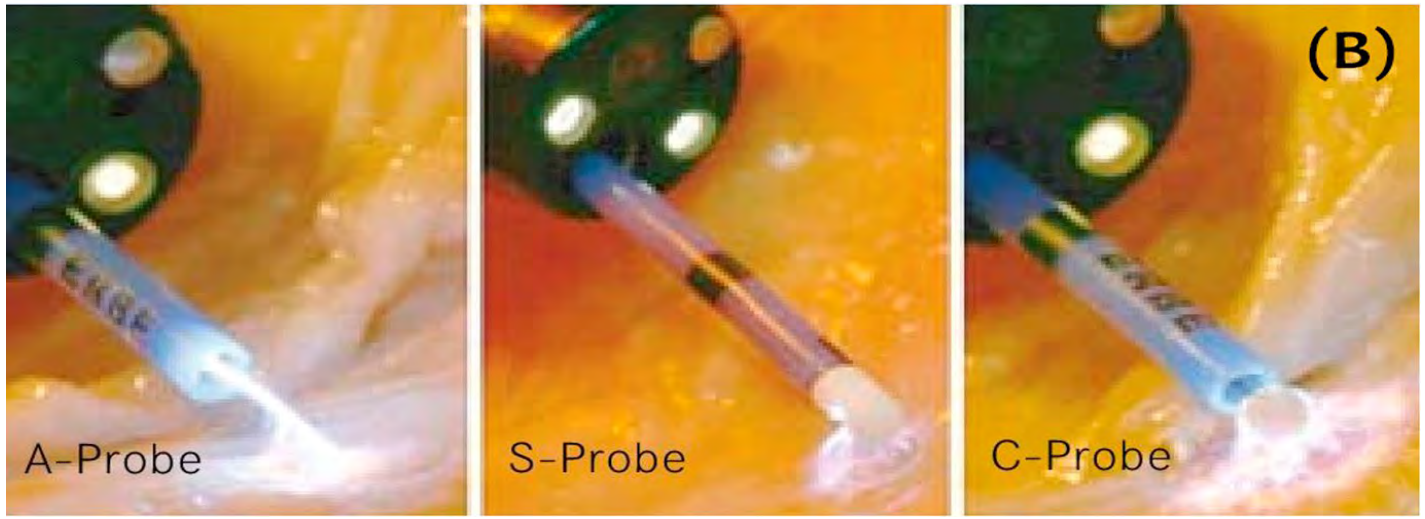
Optimal injection volume of epinephrine for endoscopic treatment of peptic ulcer bleeding

Tai-Cherng Liou, Shee-Chan Lin, Horng-Yuan Wang, Wen-Hsiung Chang

Argon Plasma Coagulation

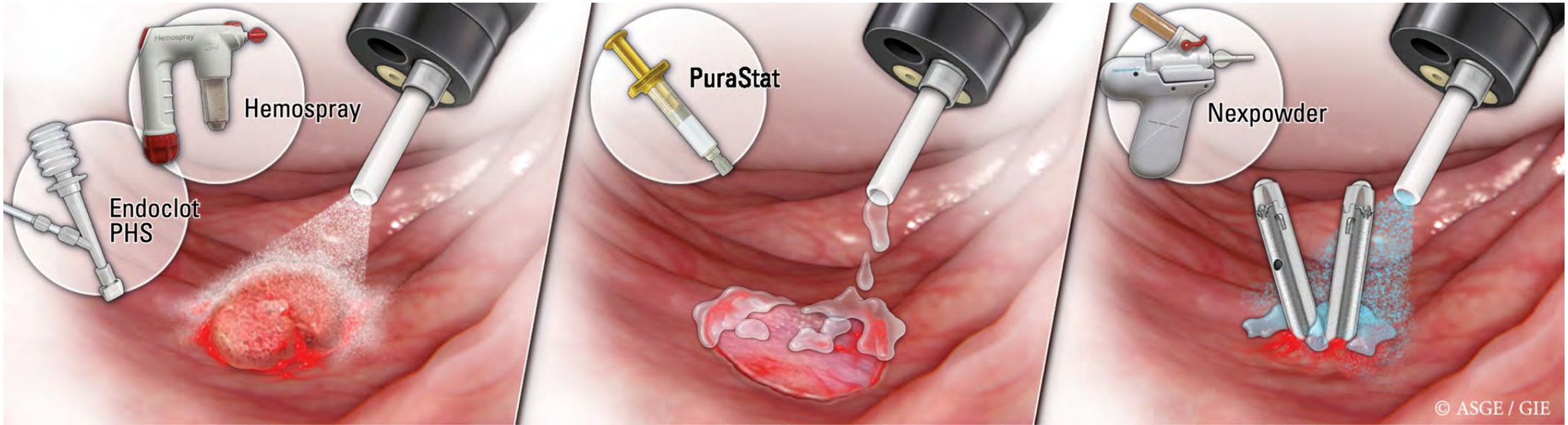
- Non-contact thermocoagulation
- Plasmajet follows path of least resistance: axial, radial and corners
- Uniform, shallow(3mm) coagulation
- Coagulation depth depends on power setting, duration of application and distance from the probe tip to the target tissue





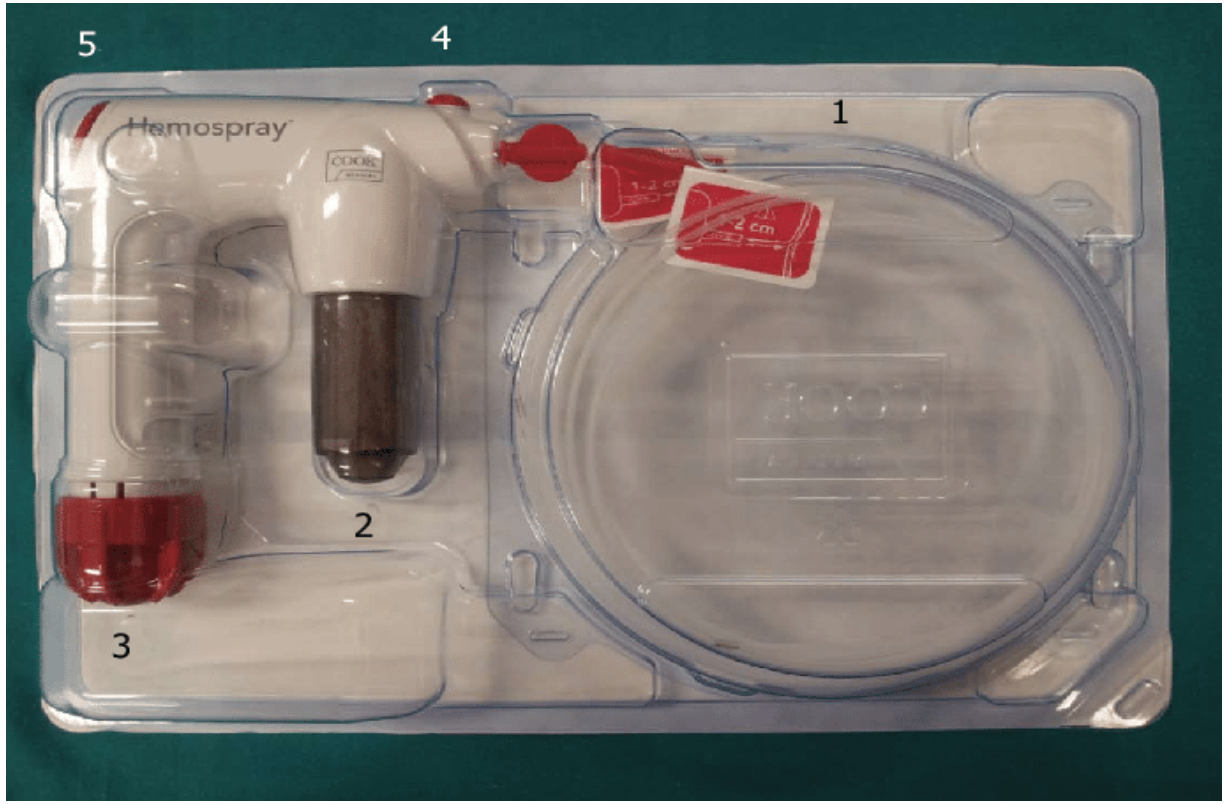
Hemostatic Powder Indications
The 5 Can’ts

- 1. **Cant Stop:** Refractory bleeding
- 2. **Cant Reach** – Difficult positions-Cardia, posterior duodenum
- 3. **Can’t finish**_ Diffuse bleeding (ischemic ulcers, GAVE, radiation)
- 4. **Can’t touch** –Risk of perforation- Thin-walled ulcer, diverticulum, ampulla
- 5. “**Cant’cer”** – Bleeding neoplasms



HEMOSPRAY

- Greatest level of evidence
- CO2 delivery
- Lasts 24hrs
- Promotes clot formation and mechanical plug
- Can be used in anticoagulated pts
- **LIMITATIONS**
- No suction allowed
- Must dry the scope channel(flush)
- Cannot get the catheter tip wet or else it clogs (use of Bonewax)



Hemospray™ package. 1: Spray catheters; 2: Powder cartridge; 3: Activation knob; 4: Security valve; 5: Trigger.

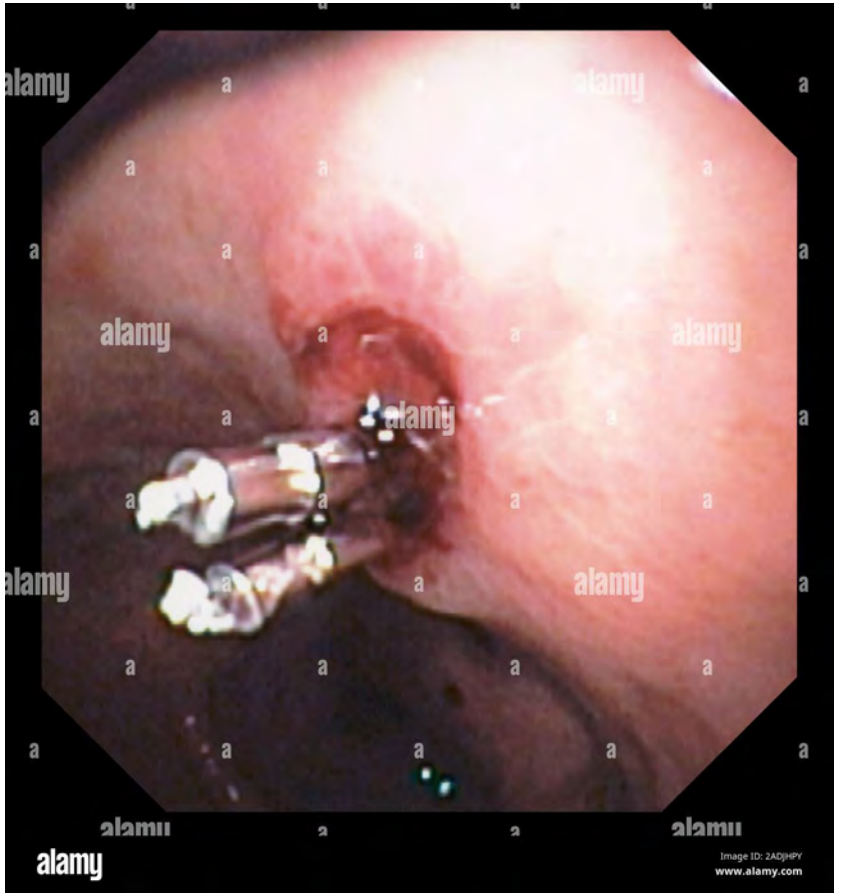
- **NEXPOWDER**
- Room air delivery
- Adjustable velocity of spray-less clogging
- Blue visualisation
- Becomes a gel, most adhesive
- Lasts 48-72hrs
- Not approved for LGIB

- **ENDOCLOT**
- 3-5g powder, needs air compressor
- Room air delivery
- Adjustable delivery(tapping/ tilting)
- Not for arterial bleeding
- Absorbs water from bleeding lesions, concentrates platelets, clotting factors, and RBC, promoting clot formation and a gelled matrix

- **PURASTAT**
- 3-5ml, needs fridge, extremely user-friendly
- The viscous liquid is applied to a bleeding area, forming a transparent gel matrix which induces hemostasis
- Does not clog
- FDA approved for prophylaxis (EMR/ESD)

Through the scope(TTS) Clips

- Directly close the vessel and provide durable hemostasis



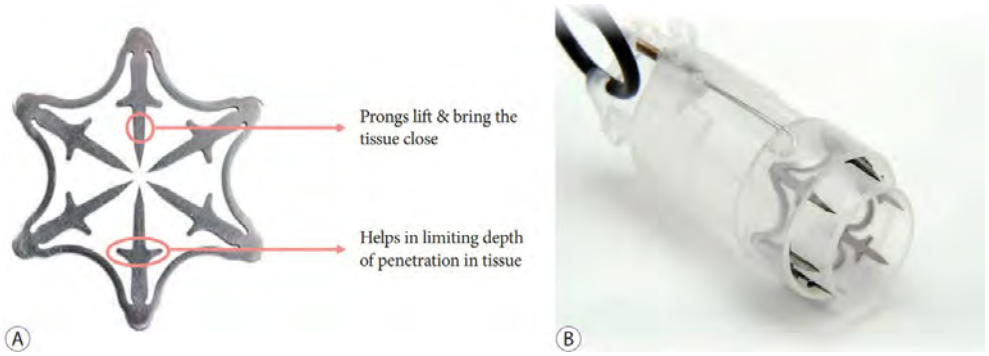
Over The scope Clips (OTSC)

- Grasp more tissue and deeper layers compared to conventional clips
- Can be used for failed prior endoscopic therapy
- **LIMITATIONS**

- Difficult in narrow or angulated locations
- More technically demanding
- Cost

Figure 1: Ovesco® over -the-scope clip.

Image courtesy of Ovesco ®



PADLOCK

SUSPECTED VARICEAL BLEED

- **Warning signs:** Cirrhosis/portal HPT, ETOH, Elevated LFTs, jaundice, Thrombocytopenia, coagulopathy, ascites, prior varices
- Esophageal varices(EV) develop above the 10mmHg HVPG threshold, subsequently increasing the risk of bleeding (typically HVPG>12mmHg)

  -HVPG >20mmHg is a strong predictor of early rebleeding and death
- Hemodynamic stabilisation
- **VARICEAL B**leed

-**V**asoconstrictor therapy

-**A**ntibiotics

-**R**esuscitation

-**IC**U level care

-**E**ndoscopy

-**AL**ternative/Rescue Therapies

-**B**eta blockade

Vasoconstrictor Therapy

- Reduce splanchnic blood flow
- Terlipressin is the only agent shown to control bleeding and mortality in RCTs amd meta-analysis
- Octreotide: 50mcgiv bolus x1 then 50mcg/hr iv for 3 – 5 days if variceal bleed on EGD
- Alternatives: vasopressin, somatostatin
- Vasopressin and nitroglycerine- too many adverse effects

Antibiotics

- Bacterial infection occurs in up to 66% of patients with cirrhosis and variceal bleed
- Prophylactic antibiotics reduces incidence of bacterial infection, significantly reducing early rebleeding
- Ceftriaxone 1g iv q24h or quinolone or broader to start, then may switch eventually to po to complete a 7-day course

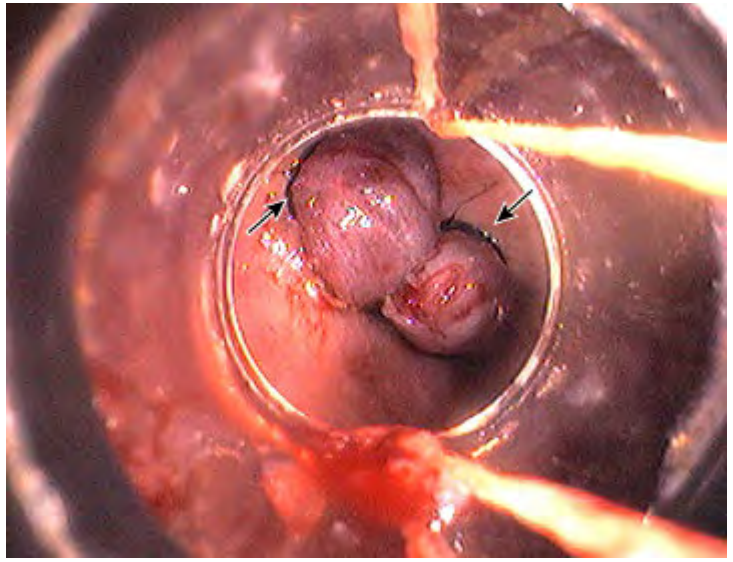
Resuscitation

- Promptly but with caution
- Goal: to maintain hemodynamic stability, HB-7-9g/dl, CVP:4-8mmHg

  -Restrictive transfusion strategy
- Avoid excessively rapid overexpansion of volume, may increase portal pressure, greater bleeding
- Platelets: consider transfusion if < 50 000
- Correct coagulopathy: consider transfusing FFPs if INR 1.5-2.0
- Consider Endotracheal intubation
- Consult colleagues: ICU. IR for possible TIPS

Endoscopy

- Should be performed as soon as possible after resuscitation (within 24hrs)
- Endoscopic variceal ligation-esophageal varices
- Sclerotherapy
- Cyanoacrylate for gastric varices
- Ballon tamponade/ Esophageal stents
- TIPS
- Surgical –mortality up to 50%
  - Non-shunt operations
  - Shunt operations
- **Experimental Approaches**
  -Hemostatic nanopowder
- IR for TIPS/BRTO if treatment failure or gastric varices



Alternative /Rescue Therapies

- TIPS
- Early placement of shunt (within 24-72 hours) is associated with improved survival among high-risk patients
- Sengstaken-Blakemore tube

  -very effective for immediate temporary control

  -High complication rate-aspiration, migration, necrosis, perforation of esophagus
- Esophageal stents

Refractory Esophageal Variceal Bleeding

- FCSEMS is superior to Blakemore tube in refractory EVB
- RCT of 29 pts randomized to FCSEMS(n=13) vs Blakemore tube (n=15) in refractory EVB
- Overall success(66% vs 20%: P=0.025)
- Control of Immediate bleeding(85% vs 47%; P=0.037)
- Less transfusions (2 vs 6 PRBC: p=0.08)
- Less SAEs (15% vs 47%; P=0.077)

HEPATOLOGY

HEPATOLOGY, VOL. 63, NO. 6, 2016

LIVER FAILURE/CIRRHOSIS/PORTAL HYPERTENSION

Esophageal Balloon Tamponade Versus Esophageal Stent in Controlling Acute Refractory Variceal Bleeding: A Multicenter Randomized, Controlled Trial

Àngels Escorsell,[1,2] Oana Pavel,[2,3] Andrés Cárdenas,[2,4] Rosa Morillas,[2,5] Elba Llop,[2,6] Càndid Villanueva,[2,3] Juan C. Garcia-Pagán,[1,2] and Jaime Bosch[1,2]; for the Variceal Bleeding Study Group

Beta blockade

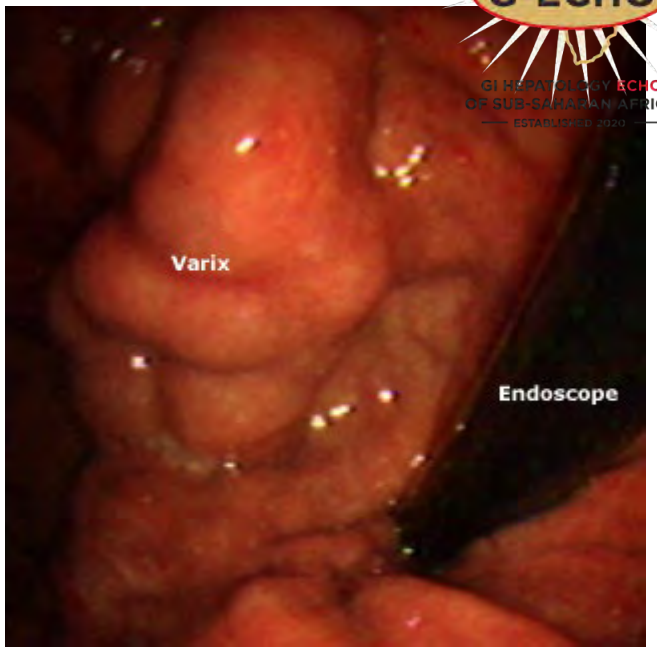
- Reduces risk of recurrent variceal bleeding
- Use of nonselective beta blockers
- Splanchnic vasoconstriction, decrease cardiac output

GASTRIC VARICES (GV)

- Rare but bleed more severely than esophageal varices and are difficult to control with higher mortality
- The vascular anatomy of GV can be highly variable and therefore not always amenable to one particular treatment option
- Goals of initial endoscopic evaluation include identification of the bleeding source and classification of the variceal bleeding site
- Following initial endoscopic hemostasis, cross-sectional (MR or CT) imaging with portal venous contrast phase should be obtained to determine vascular anatomy, including the presence or absence of portosystemic shunts and gastrorenal shunts

Zakary H et al. Clinical Gastroenterology and Hepatology 2021;19:1098–1107

GV located on the posterior and/or greater curvature side of the cardia are likely to have a distinct vascular supply from EV and are better described as **Cardiofundal GV**



GV located on the lesser curve of the cardia are more likely to have similar vascular supply as EV and are better described as **Lesser Curve GV**

GV in the gastric body and antrum are better described as **Distal GV**. These are rare, often associated with splenic vein thrombosis and and managed differently compared to GV in other sites.[13]

Table 6. Classification, prevalence and risk of bleeding of gastric varices.

Type	Definition	Relative frequency	Overall bleeding risk without treatment
GOV 1	OV extending below cardia into lesser curvature	70%	28%
GOV 2	OV extending below cardia into fundus	21%	55%
IGV 1	Isolated varices in the fundus	7%	78%
IGV 2	Isolated varices else in the stomach	2%	9%

GOV, gastro-oesophageal varices; IGV, isolated gastric varices; OV, oesophageal varices.

Management of gastric varices with acute bleeding

- Management is similar to esophageal varices (resuscitation, antibiotics, vasoactive medications)
- Variceal Banding – for GOV1(managed like esophageal varices).
- Cyanoacrylate injection therapy can be attempted if available.
- IGV1 are usually seen in splenic vein thrombosis without cirrhosis. In these patients, treatment is with splenectomy
- Coil embolization with gelatin sponge injection
- Thrombin injection
- Elastic bands and detachable snares
- TIPS
- Balloon occluded retrograde transvenous obliteration (BRTO)
- Vascular plug and gelatin sponge-assisted retrograde transvenous obliteration

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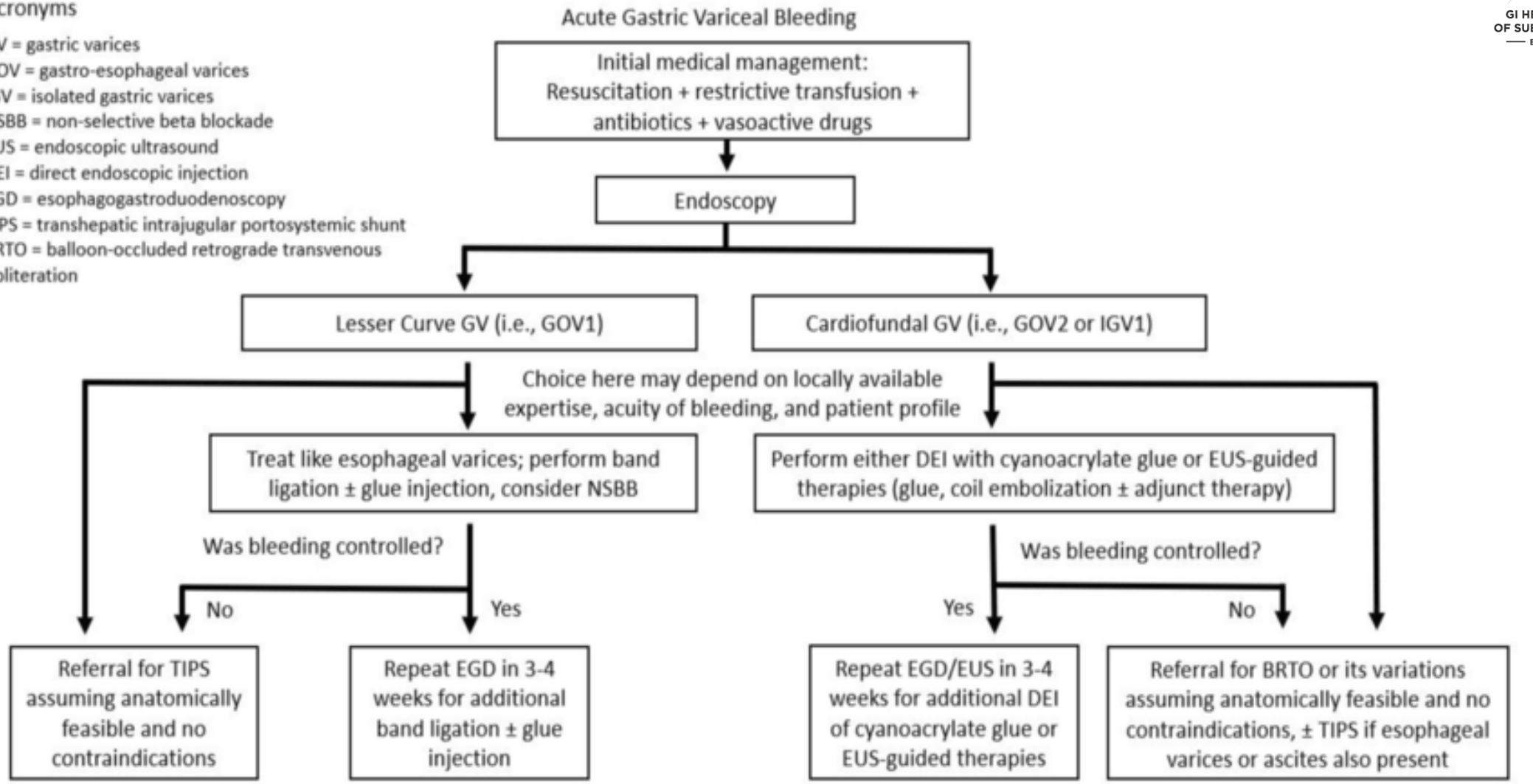
ESTABLISHED 2020

Proposed Algorithm for Management of Acute gastric Variceal Bleeding

Acronyms

GV = gastric varices
GOV = gastro-esophageal varices
IGV = isolated gastric varices
NSBB = non-selective beta blockade
EUS = endoscopic ultrasound
DEI = direct endoscopic injection
EGD = esophagogastroduodenoscopy
TIPS = transhepatic intrajugular portosystemic shunt
BRTO = balloon-occluded retrograde transvenous obliteration



Ryou M et al. Current Hepatology Reports. 2024

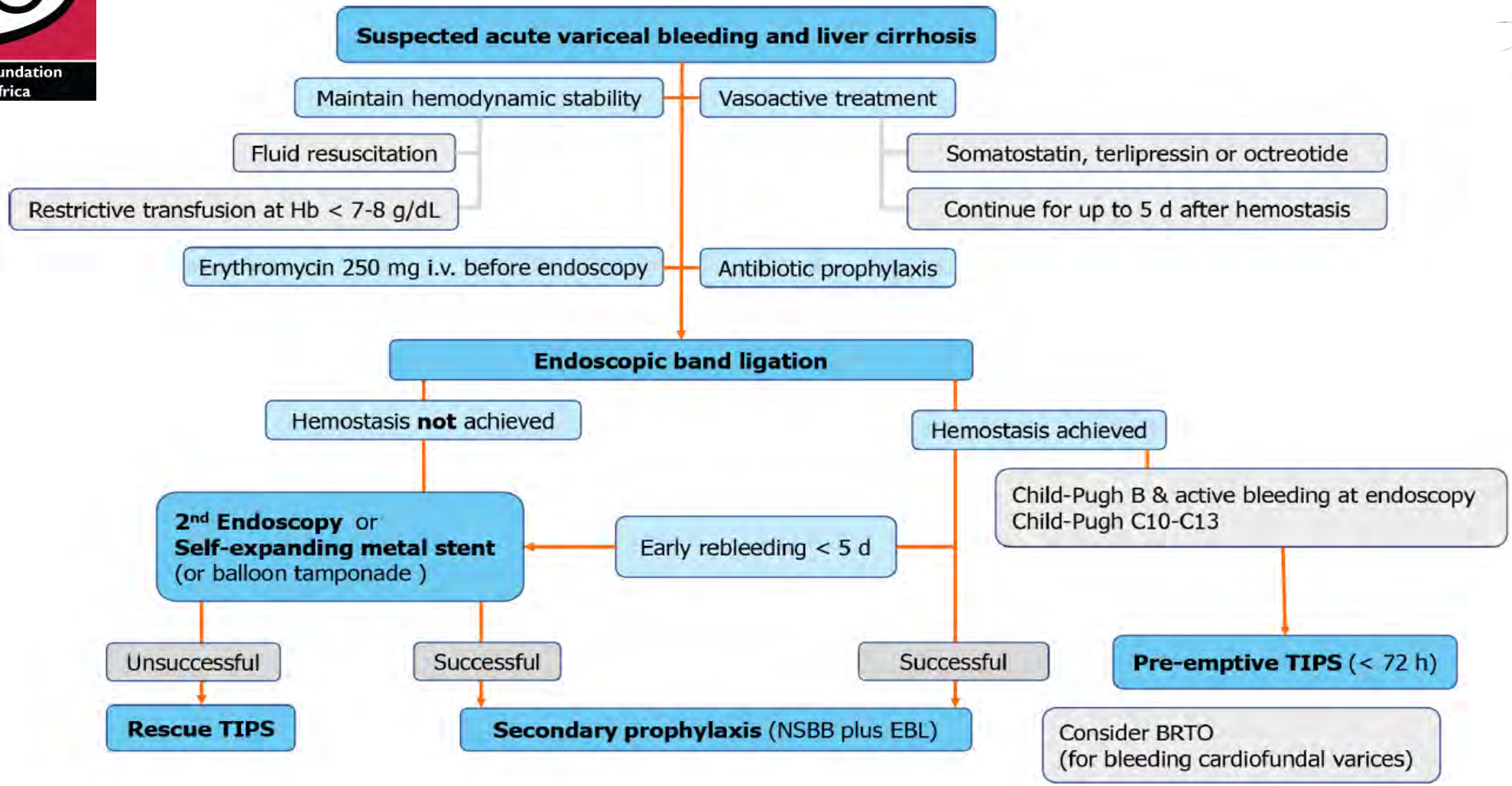


Figure 2 Clinical algorithm for treatment of patients with acute variceal bleeding (adapted from the Austrian Billroth-III guidelines)

Pfisterer et al. World J Hepatol. 2021

Gastrointestinal Stromal Tumors (GISTs)

- >95% express c-KIT (CD117)
- **Poor prognostic factors**

-Tumor size >5cm

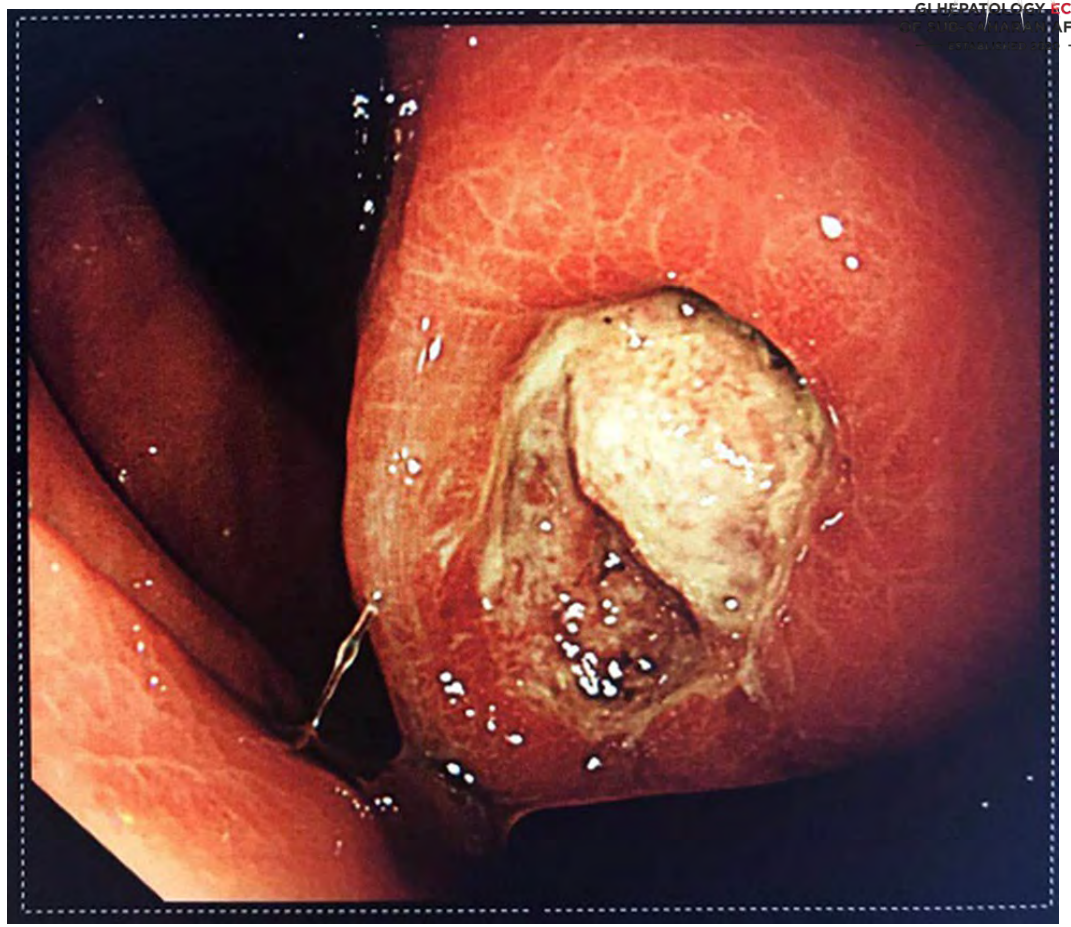
- Tumor location: small intestine> stomach
- Mitotic index 5/50hpf – aggressive behaviour
- Tumor rupture
- Haemorhagic GIST
- Positive expression of CD34
- P53 mutation
- Ki-67 expression

- **Risk stratification systems**

- They combine tumor size, mitotic rate and location

-NIH (Fletcher criteria)

-AFIP (Miettinen Criteria)



Liu et al. Cancer Management and Research 2018:10 735–743

Causes of GI Bleeding in GISTs

- Occurs in about 30-40% of GISTs
- Mucosal and submucosal destruction by tumor growth,
- Invasion of nutrient vessels leading to vascular rupture,
- Tumor necrosis,
- Joint action of digestive juices, gastrointestinal peristalsis, and fecal transmission
- Studies have shown that the proportion of stromal tumor bleeding in the small intestine is much greater than in the stomach
- Avoid biopsy during active bleeding

Treatments for GIST with GI Bleeding

- ABC/Resuscitation
- Surgery is the treatment of choice- Higher R0 resection rate
- Endoscopic techniques
- Neoadjuvant therapy-Imatinib before surgery- large tumors and chronic bleeding
- Adjuvant targeted therapy- TKIs

Endoscopic GIST Treatment

- Saline-diluted adrenaline
- Sclerotherapy
- Argon coagulation
- Clips(hemoclip or OTSC)
- Hemostatic powder
- **Limitations**

-Tumor is submucosal- bleeding source often deep

- Higher failure rate and rebleeding rates compared to peptic ulcers

Dieulafoy's lesion

- Bleeding episodes can be recurrent, profuse, or often self-limited
- Endoscopic hemostasis may be achieved with a combination of epinephrine injection followed by bipolar probe coagulation, heater probe thermal coagulation, or endoscopic clip placement
- Other approaches that have been used successfully include endoscopic band ligation, argon plasma coagulation, and cyanoacrylate injection
- Endoscopic band ligation- risk of perforation
- If rebleeding:

  -Repeat endoscopic hemostasis

  -Angiographic embolization,

  -Surgical wedge resection of the lesion

Post-Endoscopic Management

- PPI iv bolus and infusion x 72hrs if high-risk stigmata present, oral daily PPI if flat spot/ clean base ulcer
- Routine second-look endoscopy 24hrs post-EGD with endoscopic therapy is not recommended
- Repeat endoscopy if clinical evidence of recurrent bleeding is preferred over angiography or surgery
- After the second therapeutic EGD, if evidence of further bleeding (or if endoscopic control is not achieved), recommend interventional radiology angiography/embolization over surgery

ACG 2021 Guidelines

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