BRIGHAM HEALTH
BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

Massive Gastrointestinal Bleeding

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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

DISCLOSURES:

- EnteraSense- consultant
- Boston Scientific- consultant
- Cook Medical- consultant, research support
- Medtronic- consultant
- Olympus- consultant, research support
- Fuji- consultant
- GI Windows- consultant

LEARNING OBJECTIVES:

- Review:
  - Initial management of acute GI bleed (including "massive," usually UGIB)
  - Etiologies of GI bleed
  - Source control:
    - Endoscopic options, old and new
    - Endovascular options (IR), old and new
    - Surgery

WHAT IS "MASSIVE" GI BLEED?

- Active Hematemesis/Melena/Hematochezia
- Clinically unstable (hypotensive)
- Transfuse 3 units PRBC within the first 60 minutes, or 10 units pRBC within 24 hours

- This lecture will cover acute GIB, and touch on "massive" GIB where relevant

Rockall et al. Lancet 1996;347:1138
Blatchford et al Lancet 2000;356;1318
Kollef et al. Crit Care Med 1997;25:1125
Imperiale et al Arch Intern Med 2007;167:1291
Strate et al. Clin Gastro Hep 2008

INITIAL STRATEGY

- Resuscitation
- Transfusion strategy
  - Restrictive transfusion strategy (Hgb 7-9 g/dL)
  - Massive transfusion strategy
- Anticoagulation reversal / correcting coagulopathy
- Consider intubation
- Multidisciplinary help, ASAP if massive GIB
  - GI, IR, Surgery
- Determine location: upper vs lower GIB

UPPER GI BLEED

ETIOLOGIES OF UPPER GI BLEED

NON-VARICEAL (80-90%)

- Peptic ulcer (30-56%)
- Mallory-Weiss tear (15-20%)
- Erosive gastritis, duodenitis (10-15%)
- Esophagitis (5-10%)
- Arteriovenous malformation (AVM) (5%)
- Dieulafoy (2%)
- Neoplasm (1-2%)
- Other (5%)

VARICEAL (10-20%)

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VARICEAL (10-20%)

ROCKALL SCORE

	Rockall score[a]			
	0	1	2	3
Age	<60 years	60–79 years	≥80 years	
Shock	"No shock": SBP >100 mm Hg and HR <100 bpm	"Tachycardia": SBP >100 mm Hg and HR >100 bpm	"Hypotension": SBP <100 mm Hg	
Comorbidity			IHD, CHF, any major comorbidity	Renal failure, liver failure, disseminated malignancy
Diagnosis[b]	Mallory-Weiss tear or no lesion observed	Peptic ulcer disease, erosive esophagitis	Malignancy of UGI tract	
Stigmata of recent hemorrhage[b]	Clean-based ulcer, flat pigmented spot		Blood in UGI tract, clot, visible vessel, bleeding	

Score	Relapse bleeding	Mortality
<3	5%	1%
3-5	15%	5%
≥6	>30%	>15%

Rockall et al. Lancet 1996;347:1138

GLASGOW-BLATCHFORD SCORE

	Glasgow-Blatchford score[c]					
	0	1	2	3	4	6
Blood urea nitrogen, mg/dL	<18.2		≥18.2 to <22.4	≥22.4 to <28	≥28 to <70	≥70
Hemoglobin, men, g/dL	≥13	≥12 to <13		≥10 to <12		<10
Hemoglobin, women, g/dL	≥12	≥10 to <12				<10
Systolic blood pressure, mm Hg	≥110	≥100 to <109	≥90 to <99	<90		
Other markers		Pulse rate ≥100 bpm; melena[d]	Syncope[d]; hepatic disease[d]; heart failure[d]			

- GBS Score of <= 1 optimal threshold for predicting survival without intervention
- GBSC >= 7 optimal threshold for predicting need for endoscopic treatment

Blatchford et al Lancet 2000;356;1318
Stanley et al, BMJ 2017

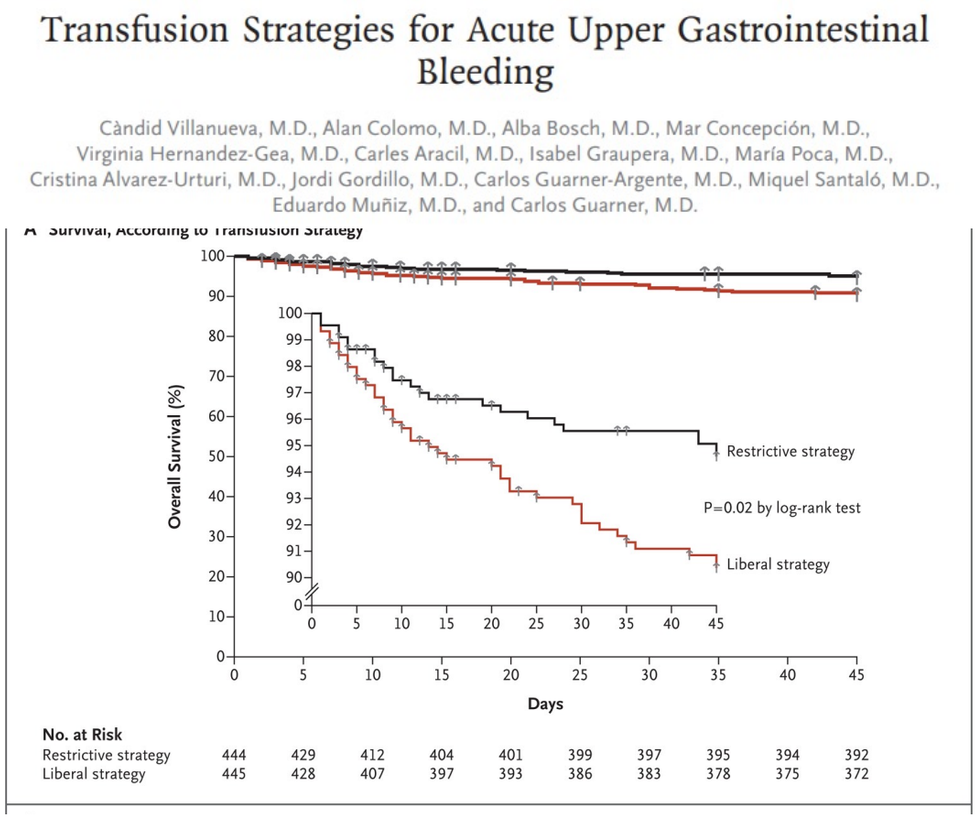
AIMS65 SCORE

	AIMS65 score[e]
Albumin <3.0 g/dL	1
INR >1.5	1
Altered mental status	1
Systolic blood pressure <90 mm Hg	1
Age >65 years	1

AIMS65 Score	In-hospital Mortality Rate
0	0.3%
1	1.2%
2	5.3%
3	10.3%
4	16.5%
5	24.5%

Saltzmanl et al. Gastrointest Endsoc 2011;74:1215

RESTRICTIVE TRANSFUSION STRATEGY



Transfusion Strategies for Acute Upper Gastrointestinal Bleeding

Càndid Villanueva, M.D., Alan Colomo, M.D., Alba Bosch, M.D., Mar Concepción, M.D., Virginia Hernandez-Gea, M.D., Carles Aracil, M.D., Isabel Graupera, M.D., María Poca, M.D., Cristina Alvarez-Urturi, M.D., Jordi Gordillo, M.D., Carlos Guarner-Argente, M.D., Miquel Santaló, M.D., Eduardo Muñiz, M.D., and Carlos Guarner, M.D.

A Survival, According to Transfusion Strategy

No. at Risk

Restrictive strategy	444	429	412	404	401	399	397	395	394	392
Liberal strategy	445	428	407	397	393	386	383	378	375	372

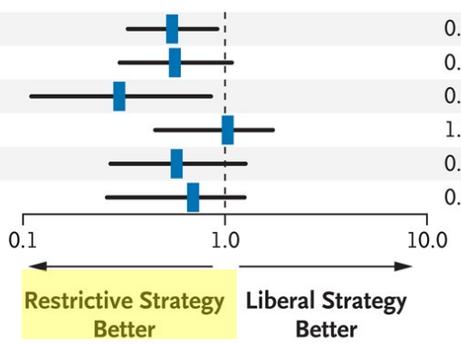
- 921 pts with acute UGIB randomized to
  - Restrictive strategy (transfuse for **< 7g/dL**)
  - Liberal strategy (transfuse for < 9g/dL)
- 30% had cirrhosis; Mean Rockall score 5.3; Mean admission HgB 9.5 g/dL
- 51% of restrictive strategy vs 14% of liberal strategy did not receive transfusions
- 6 week survival significantly improved in restrictive-strategy group (95% vs 91%, P=0.020
- Rate of further bleeding was significantly lower in restrictive strategy (10%) vs liberal strategy (16%)

Villanueva C, et al. NEJM 2013;368:

RESTRICTIVE TRANSFUSION STRATEGY

B Death by 6 Weeks, According to Subgroup

Subgroup	Restrictive Strategy	Liberal Strategy	Hazard Ratio (95% CI)	P Value
	no. of patients/total no. (%)			
Overall	23/444 (5)	41/445 (9)	0.55 (0.33–0.92)	0.02
Patients with cirrhosis	15/139 (11)	25/138 (18)	0.57 (0.30–1.08)	0.08
Child–Pugh class A or B	5/113 (4)	13/109 (12)	0.30 (0.11–0.85)	0.02
Child–Pugh class C	10/26 (38)	12/29 (41)	1.04 (0.45–2.37)	0.91
Bleeding from varices	10/93 (11)	17/97 (18)	0.58 (0.27–1.27)	0.18
Bleeding from peptic ulcer	7/228 (3)	11/209 (5)	0.70 (0.26–1.25)	0.26



- Subgroup analysis showed restrictive strategy was superior to liberal strategy for:
  - Peptic ulcer bleeding
  - Cirrhosis
    - Child-Pugh class A or B (not C)
  - Variceal bleeding
- Portal pressure gradient increased significantly in patients assigned to liberal strategy (P=0.03) but not restrictive strategy
- TRIGGER study- UK multicenter study showed no evidence of worse outcomes with restrictive strategy

Villanueva C, et al. NEJM 2013;368:
Jairath V, et al. Lancet. 2015;11.386:137-44

MASSIVE TRANSFUSION PROTOCOL

- Mainstay for hemorrhagic shock
- Landmark MTP studies (PROMMTT and PROPPR) support 1:1:1 strategy (1U pRBC, 1U FFP, 1U PLT)
- Many centers now emphasize earlier PLT and FFP use and include delivery of 6U type O RBCs, 6U FFP, and 1U apheresis PLT

Cable CA, et al. Crit Care Med 2019
Holcomb JB, et al. JAMA Surg 2013;148:127-136
Farooq N, et al. J Crit Care 2018;43:65-69.
Holcomb JB, et al. JAMA 2015;313:471-482.

MANAGEMENT OF ANTITHROMBOTICS

- Low dose ASA for secondary cardiovascular prophylaxis should not be interrupted
- For dual antiplatelet therapy (DAPT) for secondary cardiovascular prophylaxis, ASA should not be interrupted but second antiplatelet should. Suggest consulting surgery.
- Routine platelet transfusions, transexamic acid not advised
- For vitamin K antagonists, if patient is unstable, low dose Vitamin K supplemented with IV prothrombin complex concentrate (PCC), or FFP if PCC not available
- For direct oral anticoagulants (DOAC), use of reversal agent or IV PCC should be considered with severe ongoing bleeding

Gralnek I, et al. Endoscopy 2021;53:300-332.

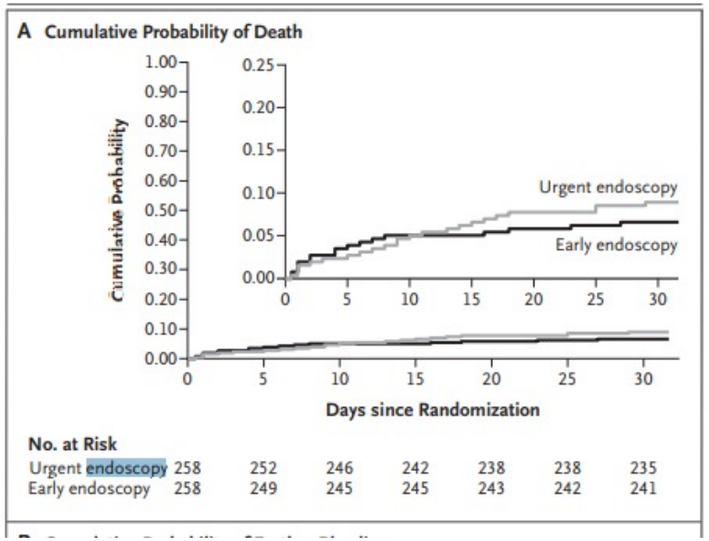
CHECKLIST FOR UPPER GI BLEED

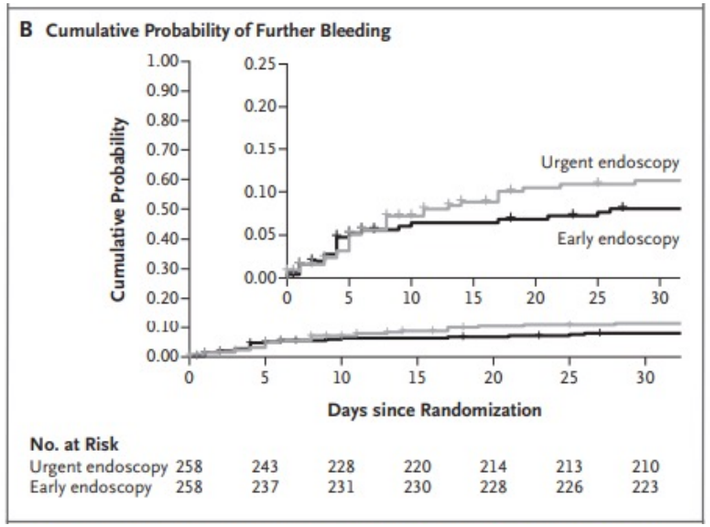
- PPI: 80 mg IV bolus, 8 mg/h or IV BID
- Give IV erythromycin 250 mg IV 30-45 min before EGD
- EGD within 24 hours (but within 12 hours if ongoing bleeding)

TIMING OF ENDOSCOPY

Timing of Endoscopy for Acute Upper Gastrointestinal Bleeding

James Y.W. Lau, M.D., Yuanyuan Yu, Ph.D., Raymond S.Y. Tang, M.D., Heyson C.H. Chan, M.B., Ch.B., Hon-Chi Yip, M.B., Ch.B., Shannon M. Chan, M.B., Ch.B., Sally W.Y. Luk, M.B., Ch.B., Sunny H. Wong, Ph.D., Louis H.S. Lau, M.B., Ch.B., Rashid N. Lui, M.B., Ch.B., Ting T. Chan, M.B., Ch.B., Joyce W.Y. Mak, M.B., Ch.B., Francis K.L. Chan, M.D., and Joseph J.Y. Sung, M.D.

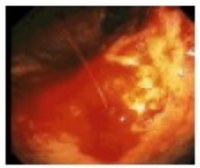




- RCT: 516 pts with overt acute UGIB and GBS >12 randomized to:
  - Urgent EGD (within 6 h)
  - Early EGD (6-24h)
- 30d mortality 8.9% (Urgent) vs 6.6% (Early)
- Further bleed within 30d occurred in 10.9% (Urgent) vs 7.8% (Early)
- No improved mortality for urgent EGD

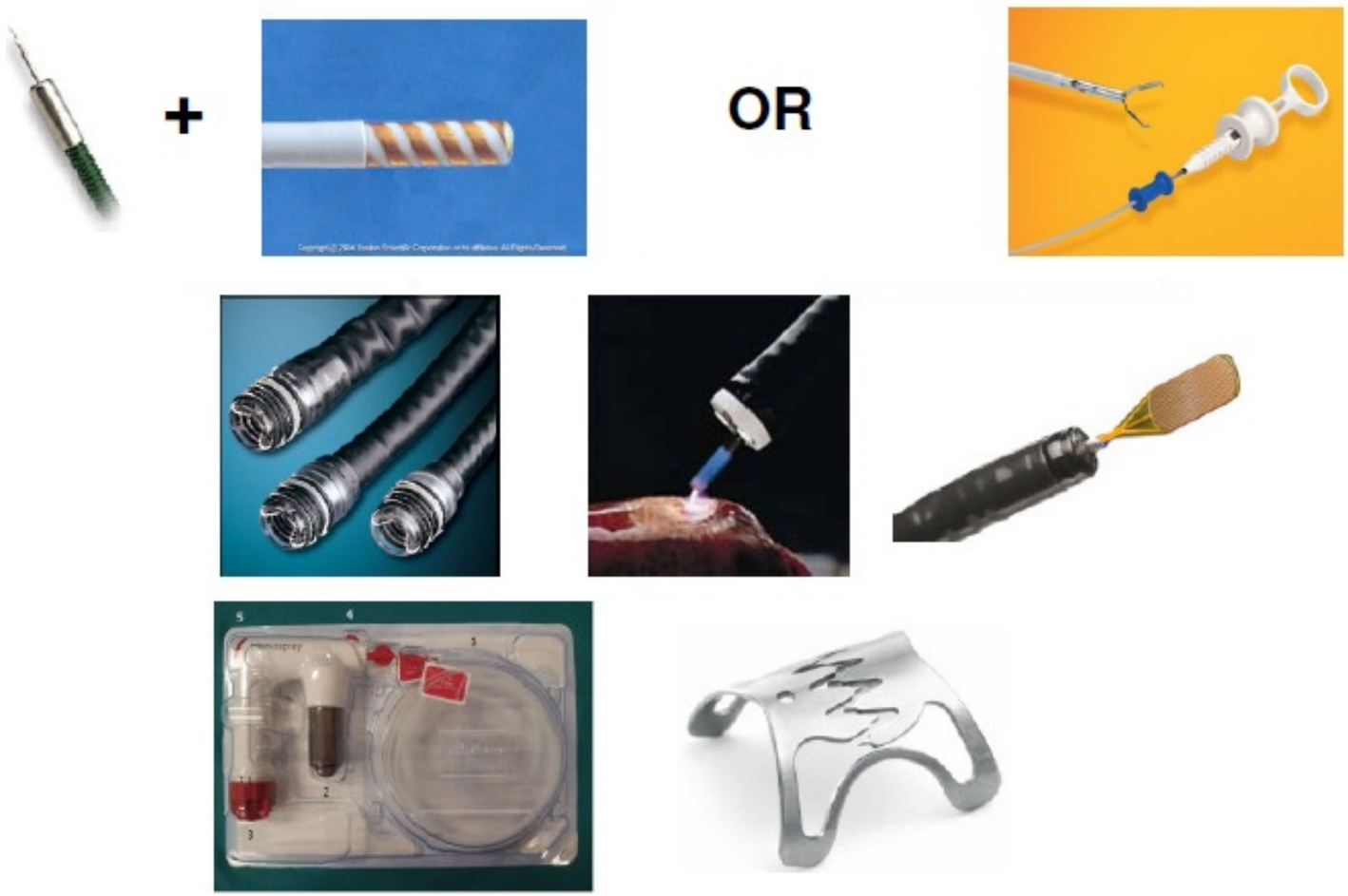
Lau JYW, et al. NEJM 2020

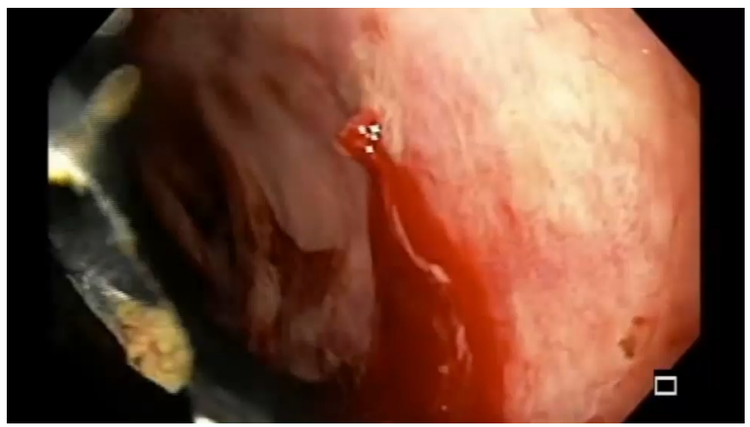
STIGMATA OF ULCERS

	Endoscopic stigmata	% Rebleed	
	Clean-based ulcer	<3%	Low risk
	Pigmented flat spot	<8%	
	Adherent clot	20%	High risk
	Nonbleeding visible vessel	40%	
	Active bleeding	55%	

Laine et al. NEJM 1994;33:717.

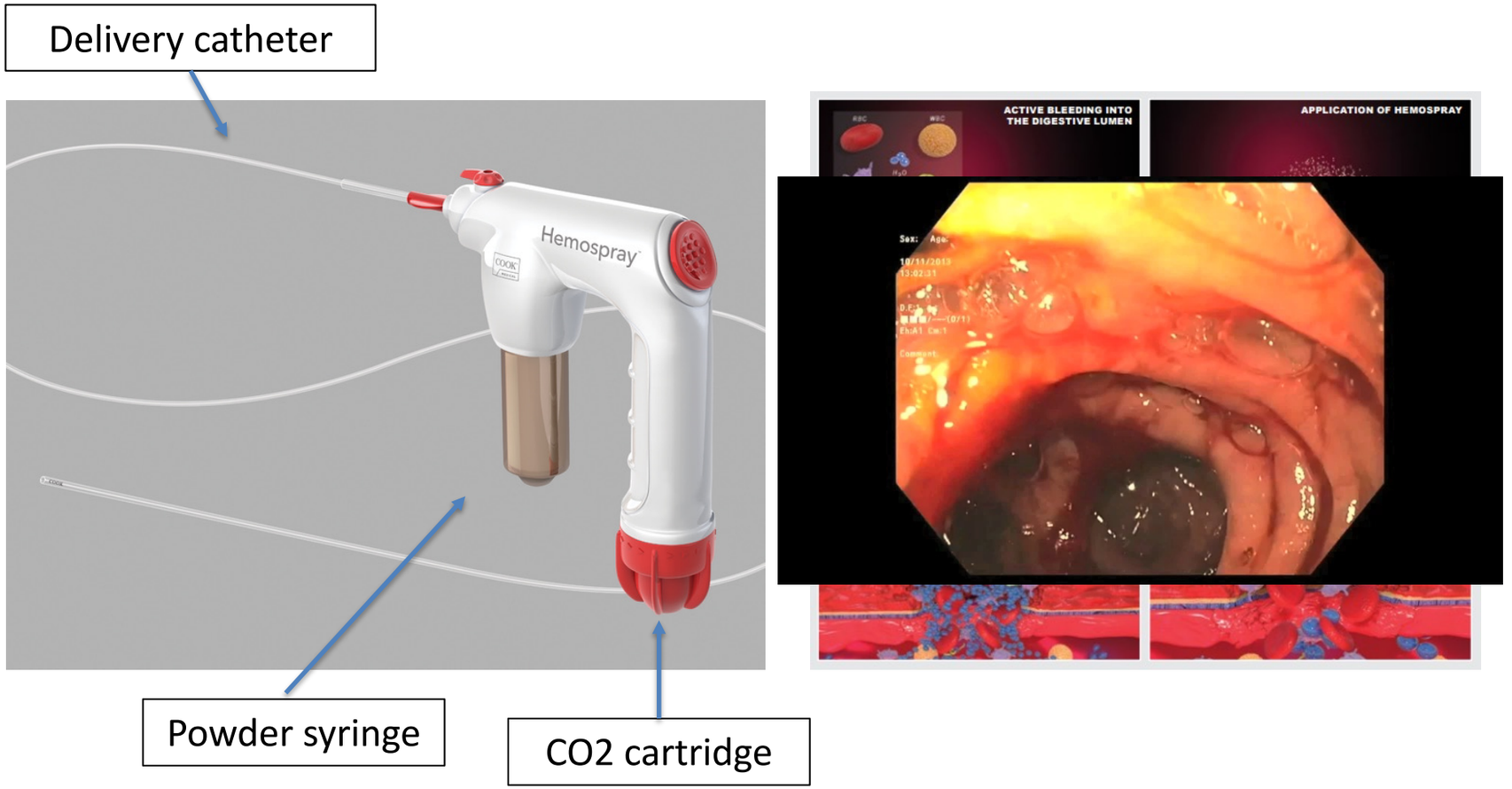
ENDOSCOPIC THERAPIES





Video from Mansour Parsi, VideoGIE 2019;4;285

RECENT ADDITION: HEMOSPRAY



- Hemospray (T325) absorbs water (dessicant) from blood
- Acts both cohesively and adhesively, forming mechanical barrier over bleeding site
- Does not affect clotting cascade

Huang ES et al. Gastrointest Endosc 2011
Rocket D et al J Invest Med 2017
Video from Gastrointest Endosc 2014;80:1170

▶ **Fig. 1** Endoscopic images of a peptic ulcer bleed. **a** A Forrest classification Ib oozing peptic ulcer bleed. **b** Hemospray application. **c** Immediate hemostasis achieved.

▶ **Table 2** Outcomes in overall ulcer bleeding cohort.

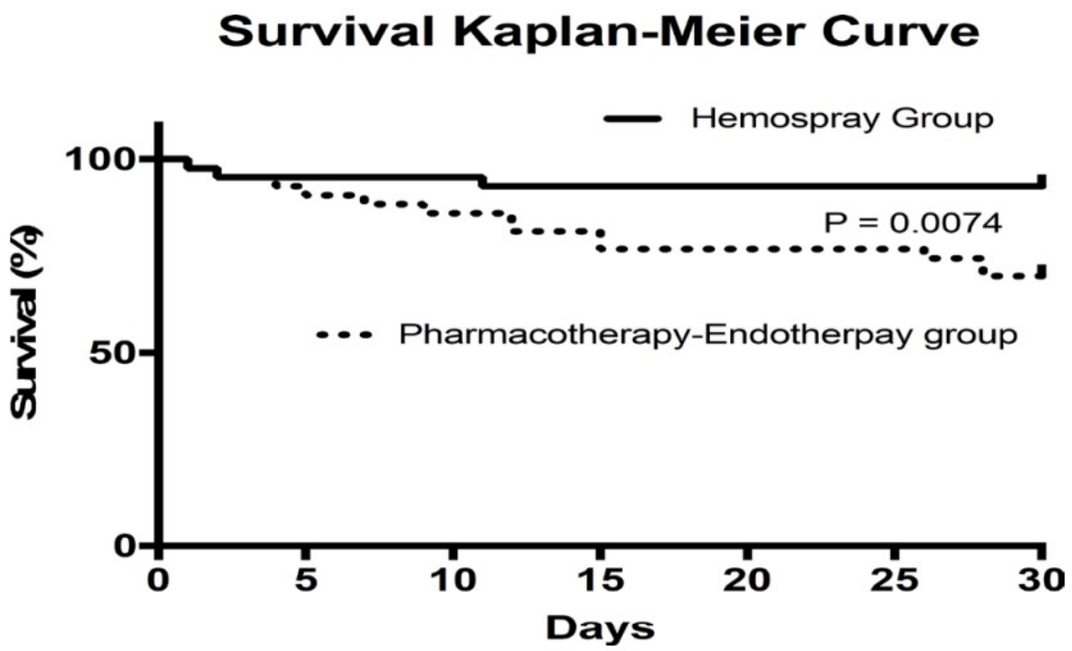
	Ulcers (n = 202), n/N (%)	Rockall score, median (IQR)	Blatchford score, median (IQR)
Hemostasis rate	178/202 (88)	7 (6 – 8)	12 (10 – 14)
Rebleeding rate	26/154 (17)	7 (6 – 8)	13 (12 – 14)
7-day mortality	21/175 (12)	8 (7 – 8)	15 (13 – 17)
30-day mortality	38/175 (22)	8 (7 – 8)	14 (10 – 16)

- Largest international registry study for Hemospray
- Hemospray may play role in achieving immediate hemostasis in high risk ulcers
- If used as monotherapy or rescue therapy, second look endoscopy is warranted

Huseein et al. Endoscopy 2021

ORIGINAL ARTICLE

Early application of haemostatic powder added to standard management for oesophagogastric variceal bleeding: a randomised trial



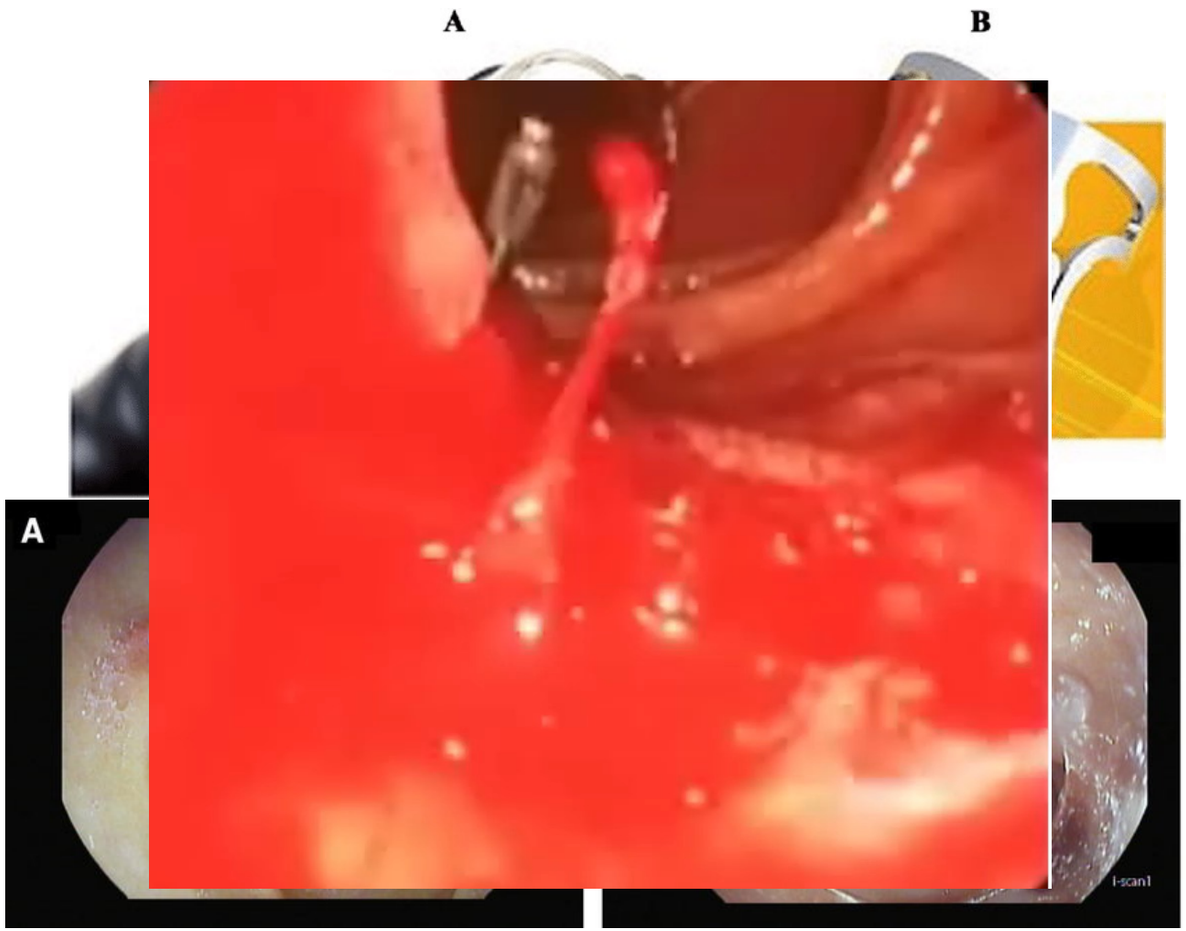
- 86 cirrhotic patients with acute variceal bleed randomized to
  - Hemospray within 2 hours followed by early EGD the next day
  - Early elective EGD within 24h
- 5/43 (12%) in study group vs 13/43 (30%) in control group had failure of hemostasis (p=0.034)
- 6 week survival was significantly improved in study group (7% vs 30%, p=0.006)

Ibrahim et al. Gut 2019

HEMOSPRAY: SUMMARY

- Pros: easy to use, not much skill required, safe, effective
- Cons: obscures endoscopic view, temporary measure
- Unknowns: control of spurter, recurrent bleeding risk, performance characteristics relative to other modalities and in combination with other modalities

SPOTLIGHT: OVER-THE-SCOPE CLIP (OTSC)



Compared to hemoclips, OTSC can:

- Handle bigger ulcers
- Take care of deeper (and probably larger) vessels
- Close perforations at the same time

Video from Prof Chiu, Prince of Wales Hospital

Randomized Controlled Trial of Over-the-Scope Clip as Initial Treatment of Severe Nonvariceal Upper Gastrointestinal Bleeding

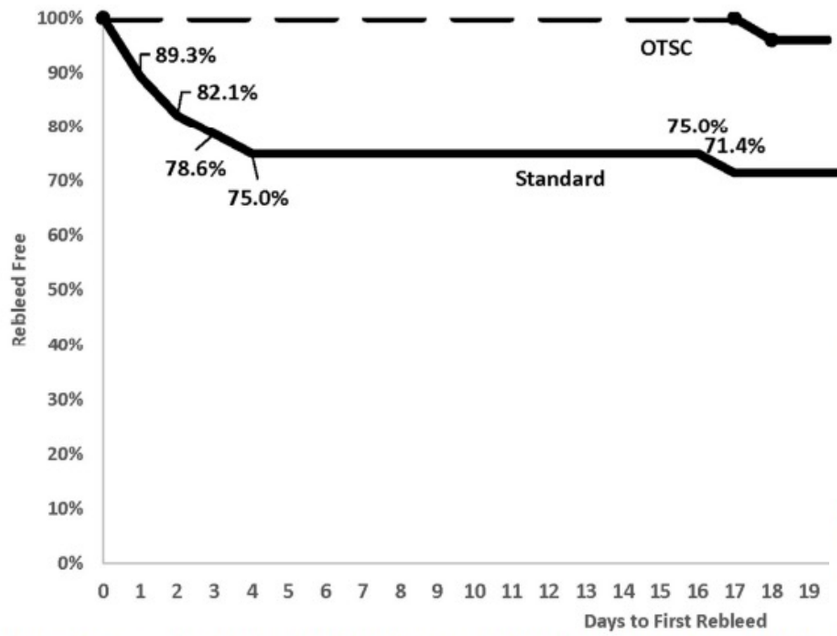


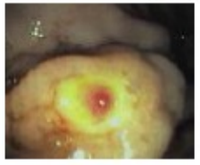
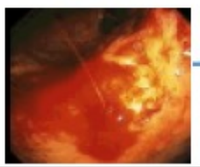
Table 2. 30 Day Clinical Outcomes of Patients by Endoscopic Treatment

	OTSC (n = 25)	Standard treatment (n = 28)	*P* value
Further bleeding[a]	1 (4)	8 (28.6)	.017
Severe complications[a]	0 (0)	4 (14.3)[b]	.049
Angiographic embolization[a]	0 (0)	2 (7.1)	.173
Surgery	0	0	—
Deaths	0	0	—
Units RBCs after randomization	0.04 ± 0.2	0.68 ± 1.56	.030
Hospital days	7.56 ± 8.17	10.0 ± 16.19	.227
ICU days	2.40 ± 3.48	11.11 ± 37.06	.236

- 53 patients with bleeding ulcers and stigmata of hemorrhage randomized to
  - OTSC (Clip)
  - Standard therapy with hemoclips or multipolar electrocoagulation
- OTSC significantly reduced rates of rebleeding, severe complications, and post randomization blood transfusions
- Patients with major stigmata of hemorrhage (spurting, visible vessel or clot) benefited significantly from OTSC, while lesser stigmata did not

POST-EGD MANAGEMENT OF NON-VARICEAL UGIB



Feed and discharge

PO PPI QD with GI f/u

Check H. pylori

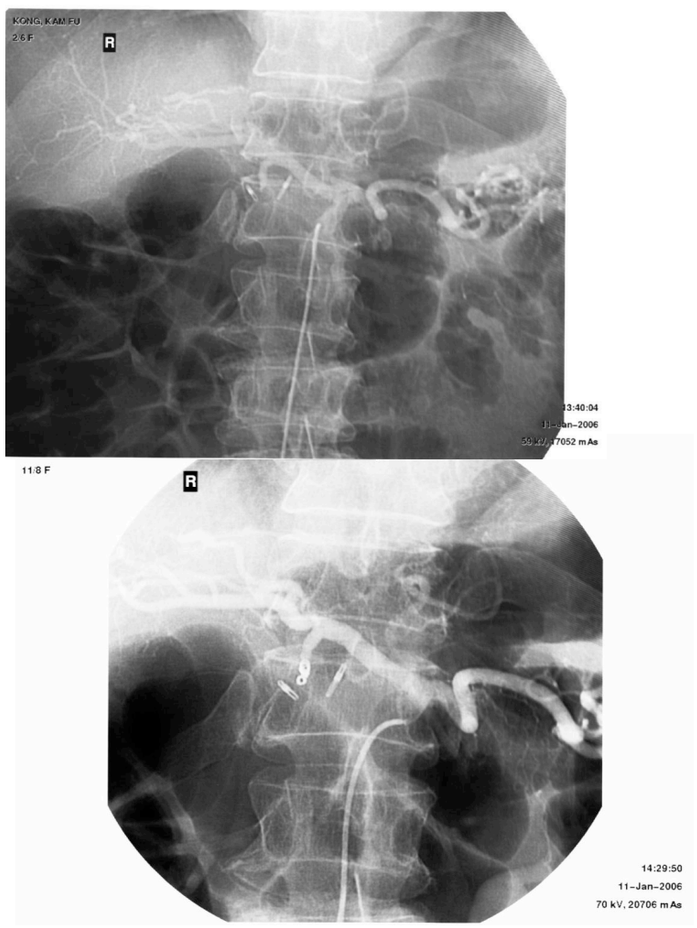
Watch 72h

IV PPI BID x 72 h, then PO BID x 14d, then PO QD x14d

- H pylori ulcer:
  - Treat H. pylori & stop PPI
- NSAID-induced ulcer:
  - Only continue PPI if continuing NSAID
- Idiopathic ulcer:
  - Continue PPI indefinitely
- If anemic, IV iron one dose or PO iron x 3 months

Laine L et al. JAMA 2014.
Hwang JH et al. GIE 2012.
Barkun A et al. Ann Int Med 2010.
Cheng HC et al. Gut 2014.

ANGIOGRAPHY vs SURGERY AS RESCUE



- Retrospective study of 3271 pts with bleeding peptic ulcer
- 1254 (38%) required endoscopic hemostasis
- 1218 (97%) had successful hemostasis
- 36 (3%) failed and underwent transarterial embolization (13) or surgery (23)
- 166 (13.6%) had rebleeding, of which 52 (31.3%) failed 2nd endoscopic Rx
  - These went to TAE (19) or Surgery (33)

Wong, et al. Gastrointest Endosc 2011

ANGIOGRAPHY vs SURGERY AS RESCUE

Outcomes	Embolization n = 32	Surgery n = 56
Mean Age (Yr)	73	71
Mean transfusion (Units)	15.6	14.2
Mean days of hospitalization	17.3	21.6
Recurrence of bleeding	11 (34.4%)	7 (12.5%)#
Complications	40.6%	67.9%#
Death	8 (25%)	17 (30%)

Wong, et al. Gastrointest Endosc 2011

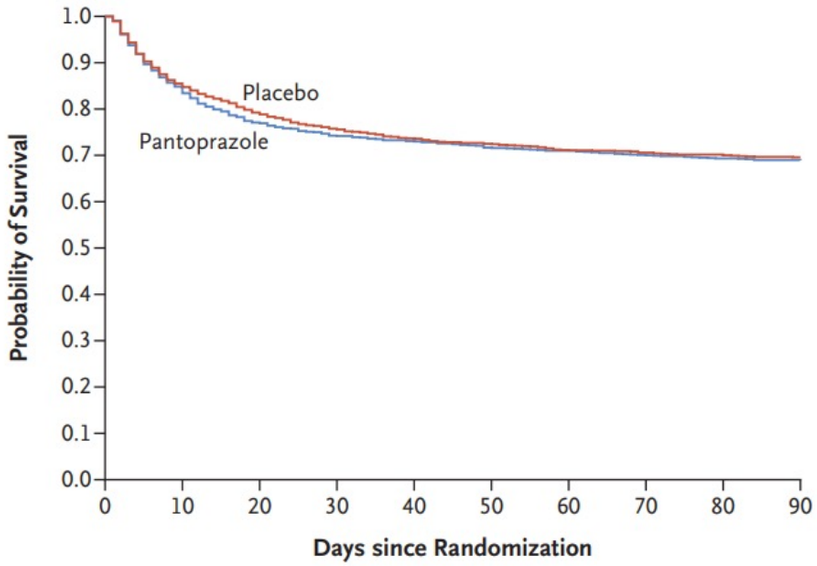
WHAT ABOUT STRESS ULCERS?

- Prior guidelines: Stress ulcer prophylaxis (SUP) should only be for ICU patients with risk factors for "clinically important bleeding" which appears related to
  - overall severity of illness,
  - use of organ support (mech ventilation, circulatory support, and renal replacement therapy)
  - Coexisting diseases (coagulopathy, liver disease)
- PPI favored over H2B
- PPIs associated with increased infections (C dif, pneumonia)

Barletta et al Crit Care Med 2016

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 DECEMBER 6, 2018 VOL. 379 NO. 23

Pantoprazole in Patients at Risk for Gastrointestinal Bleeding in the ICU



- European, multicenter, parallel group, blinded
- 3298 ICU patients randomized to IV Pantoprazole vs placebo
- No difference in 90-d mortality (31.1% vs 30.4%)
- 2.5% of PPI cohort had clinically important GIB vs 4.2% in placebo
- 21.9% of PPI cohort vs 22.6% of placebo cohort had composite GIB, pneumonia, C dif, or MI

SUMMARY: NON-VARICEAL UPPER GI BLEED

- Use GBS for pre-endoscopy risk stratification (unless obviously clinically hemorrhaging)
- Following hemodynamic resuscitation, early EGD (<24h) should be performed; <12h does not lead to improved outcomes
- In hemodynamically stable patients with acute UGIB, restrictive transfusion strategy (goal HgB>7 g/dL)*
- Stopping antithrombotic and possibly giving reversal agent is warranted in severe bleeding

SUMMARY: NON-VARICEAL UPPER GI BLEED

- For actively bleeding ulcers, endoscopic combination therapy is warranted
- For bleeding refractory to standard hemostasis modalities, consider hemospray or OTSC clips
- High-dose PPI for patients who receive endoscopic Rx
- If failed 2nd endoscopic attempt or severe bleeding, consider angiographic embolization
- For patients who require ongoing anticoagulation (AC), resume as soon as bleeding has been controlled, preferably within 7 days, based on thromboembolic risk

ETIOLOGIES OF UPPER GI BLEED

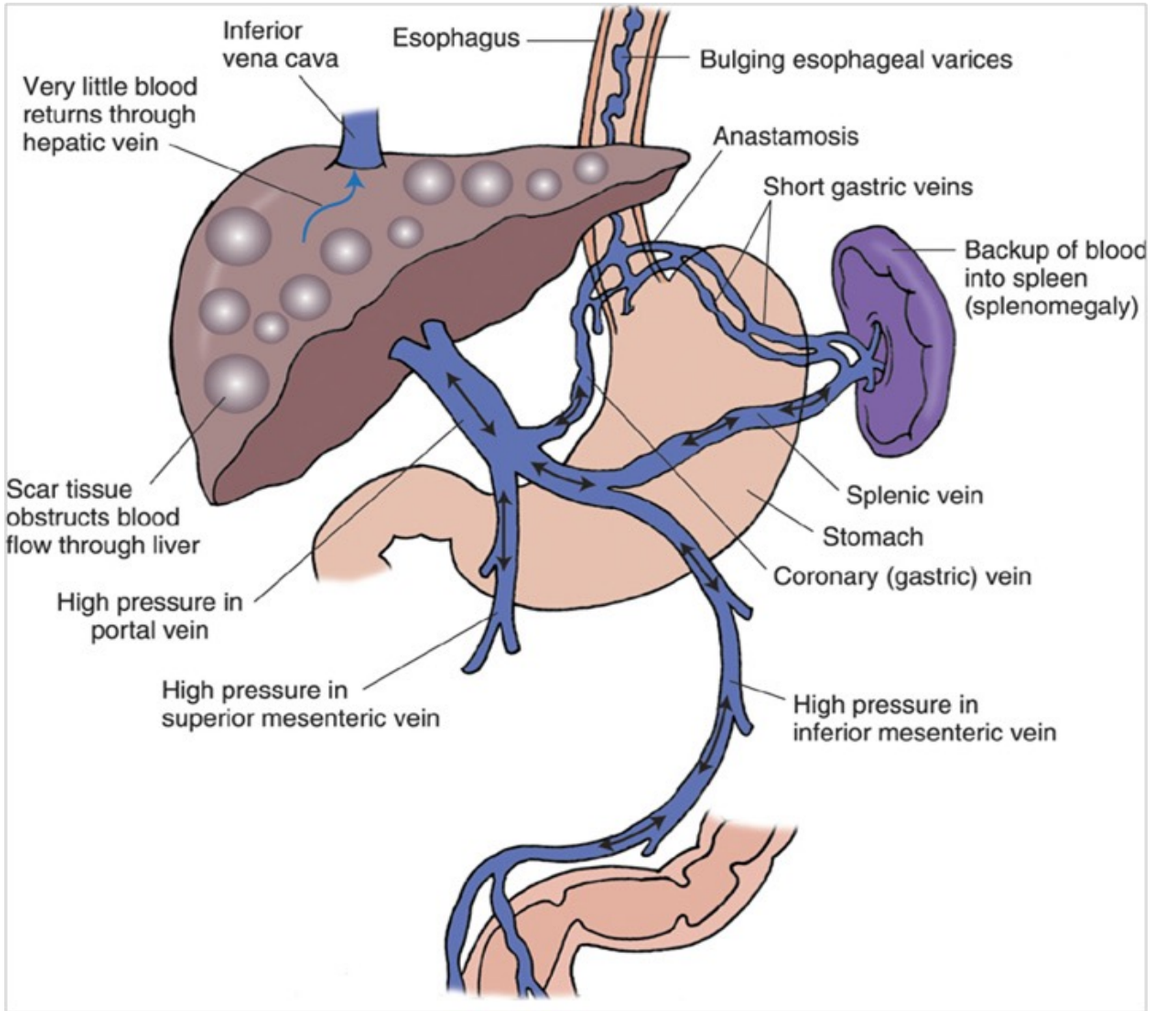
NON-VARICEAL (80-90%)

- Peptic ulcer (30-56%)
- Mallory-Weiss tear (15-20%)
- Erosive gastritis, duodenitis (10-15%)
- Esophagitis (5-10%)
- Arteriovenous malformation (AVM) (5%)
- Dieulafoy (2%)
- Neoplasm (1-2%)
- Other (5%)

VARICEAL (10-20%)

ESOPHAGEAL VARICES

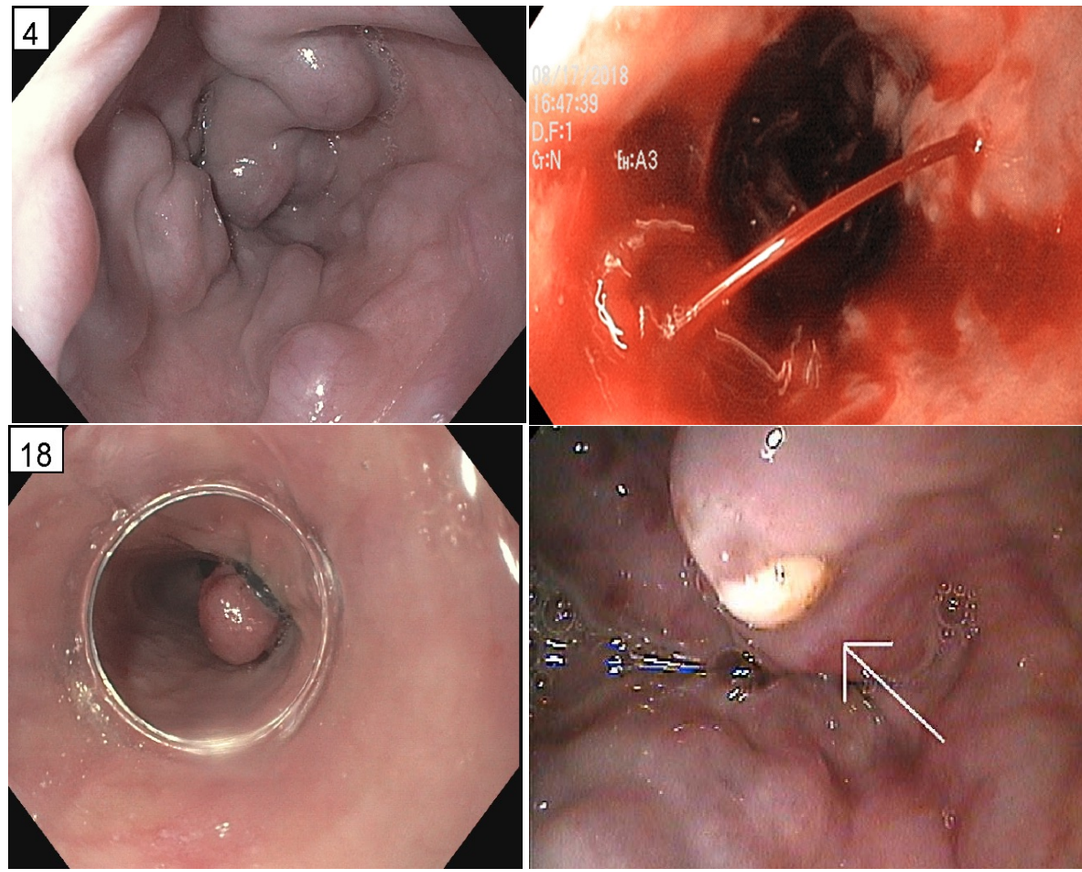
- 5%-15% of cirrhotic pts per year develop EV
- EV correlate with severity of liver disease
  - 40% of Childs A; 85% of Child C
- 6-week mortality among patients with index variceal bleeding is 20%
- Risk of rebleeding without endoscopic intervention is 60%
- In cirrhotic pts, assume it's EV bleeding until proven otherwise



Boregowda et al. World J of Gastro Pharm and Therapeutics 2019.

MANAGEMENT OF ACUTE EV BLEEDING

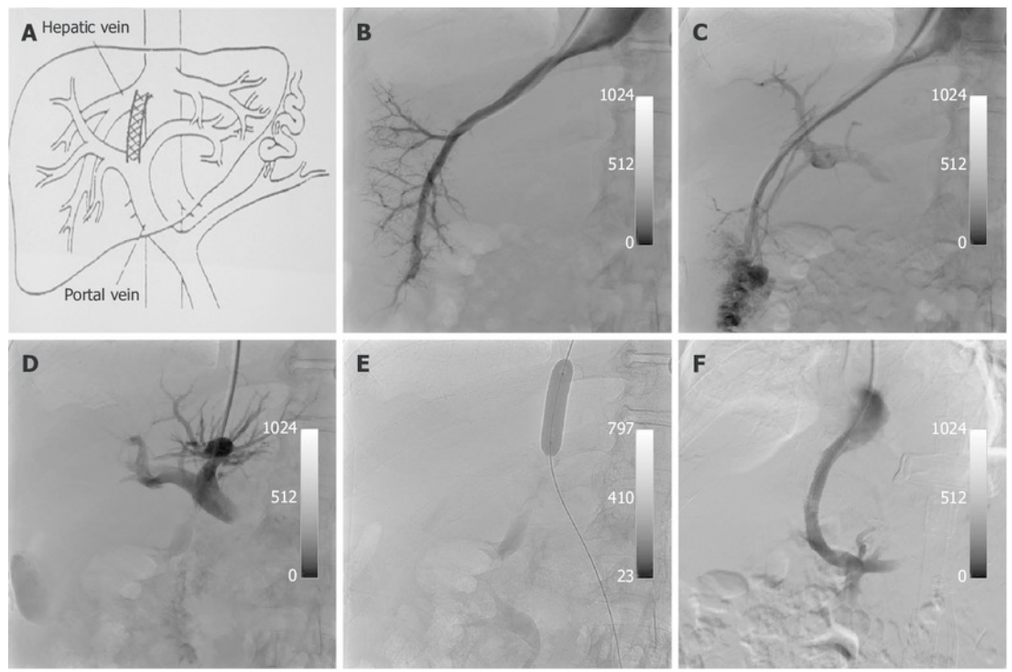
- Hgb goal 7-9 g/dL (restrictive)
- Ceftriaxone 1 g daily→ max of 7 days
- Octreotide for 2-5 days (Terlipressin not available in US)
- EGD within 12 hours
- EVL if you see active bleeding, EV + blood in stomach or white nipple sign
- Endoscopic sclerotherapy acceptable as rescue
- No role for recombinant factor VIIa or FFP
- Plt transfusion? No recommendations



Garcia-Tsao, et al. Hepatology 2017. Vol 65; 310-335

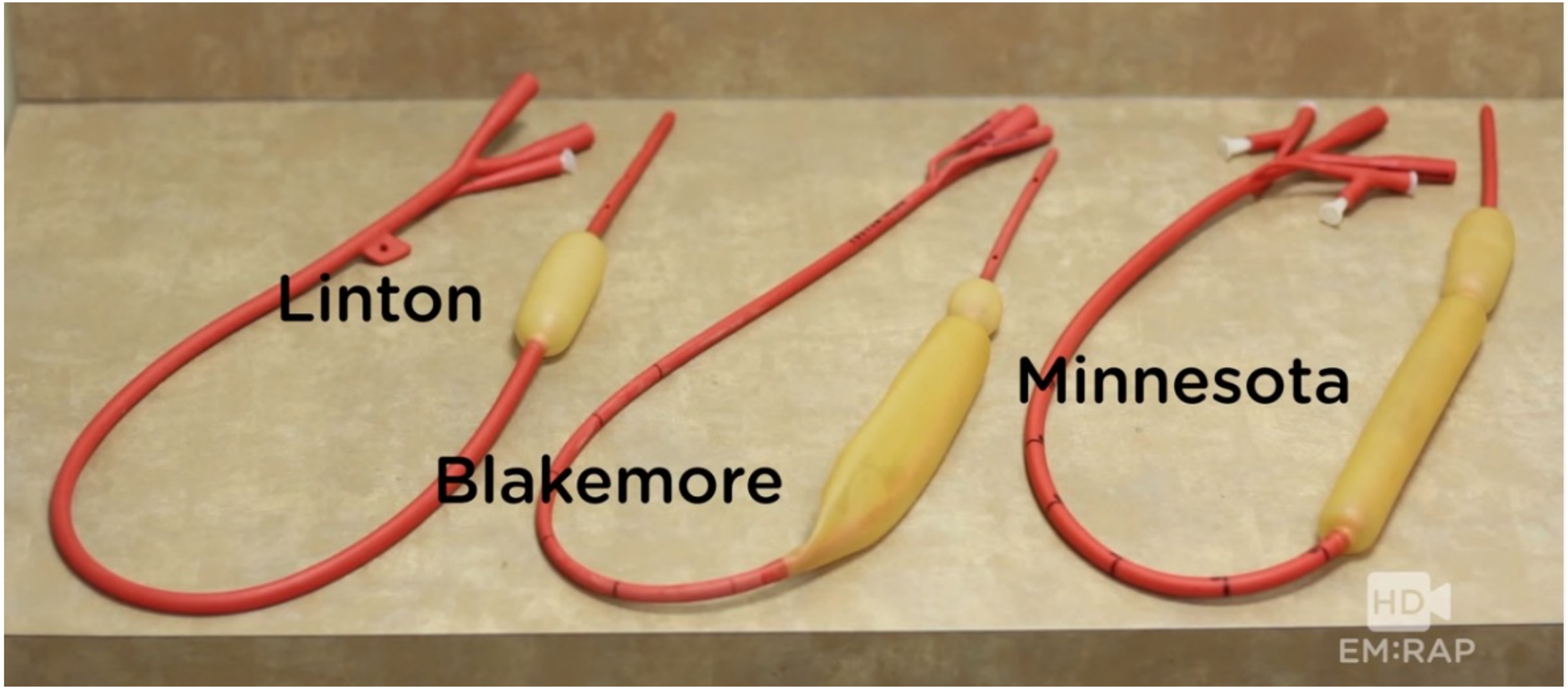
MANAGEMENT OF ACUTE EV BLEEDING

- Transjugular Intrahepatic Portosystemic Shunt (TIPS)
  - –"Early" within 72 hrs in select patients → recommended if no contraindications and deemed high risk with:
    - •HVPG > 20 mm Hg
    - •CTP Class C or B with active bleeding
  - –Or if bleeding recurs despite EVL and vasoactive drugs



Garcia-Tsao, et al. Hepatology 2017. Vol 65; 310-335

SPOTLIGHT: BALLOON TAMPONADE



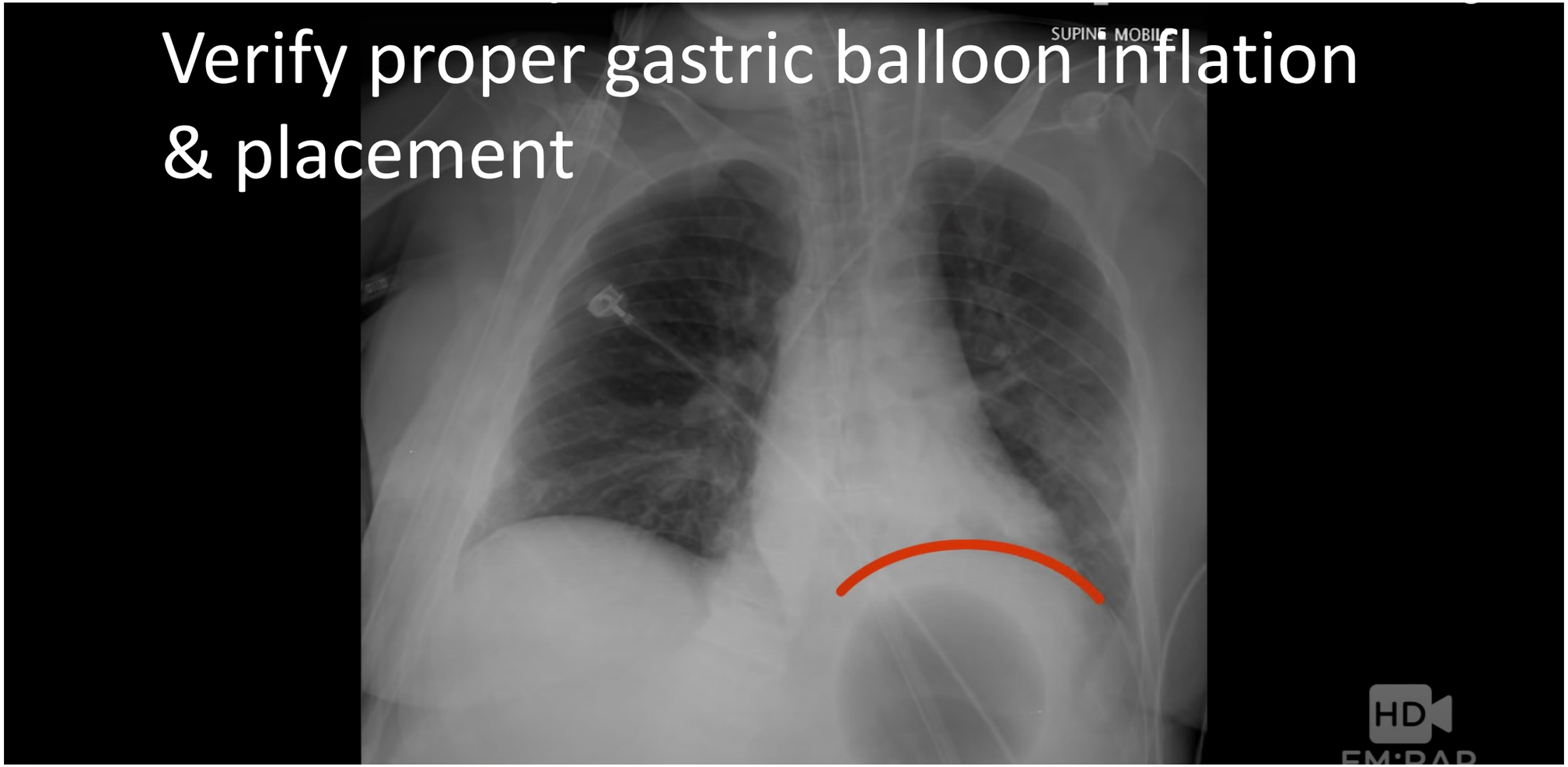
Placement of a Blakemore Tube for Bleeding Varices - YouTube

[Placement of a Blakemore Tube for Bleeding Varices - YouTube]

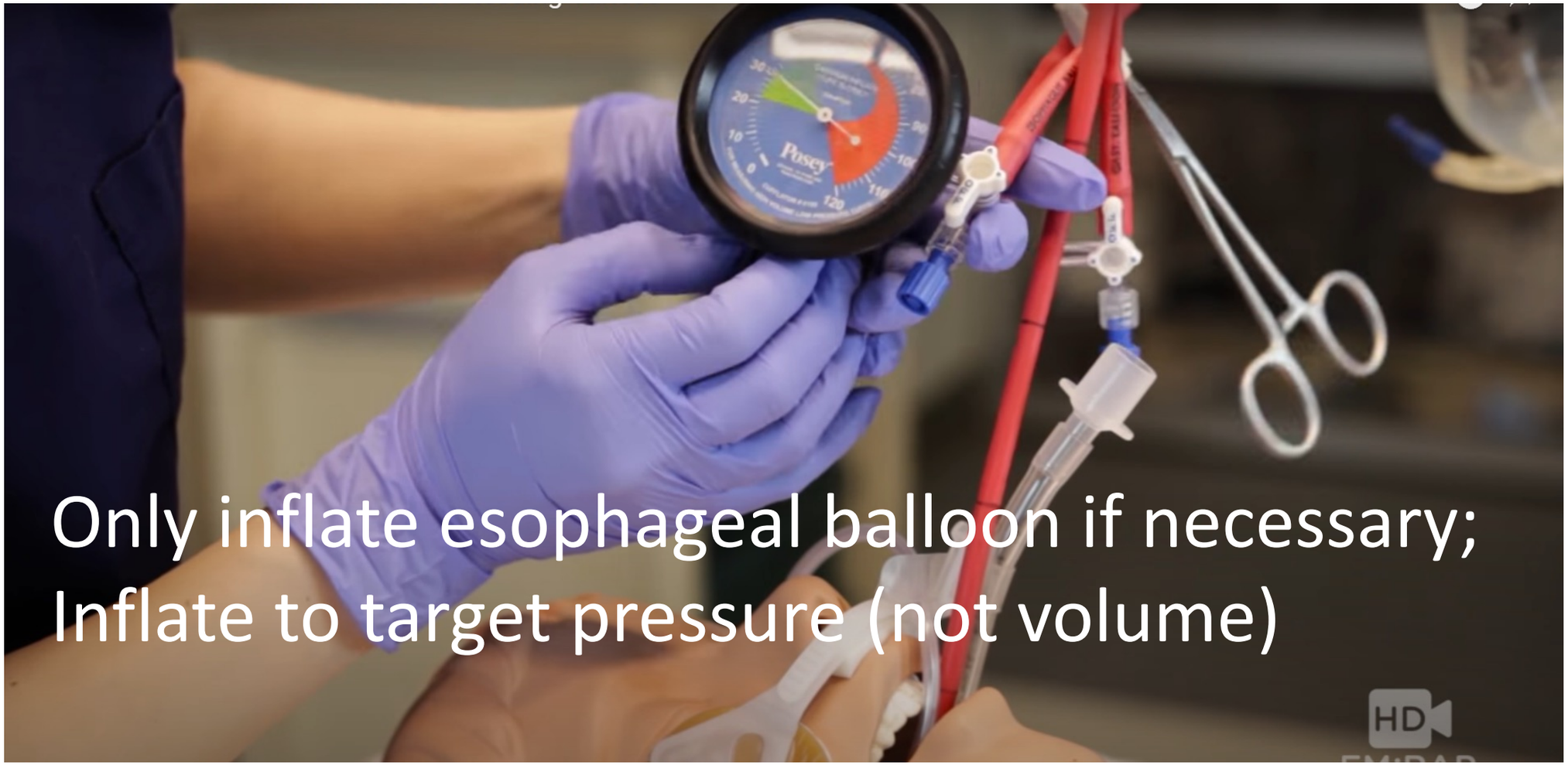
[Placement of a Blakemore Tube for Bleeding Varices - YouTube]

Placement of a Blakemore Tube for Bleeding Varices - YouTube

Verify proper gastric balloon inflation & placement



Placement of a Blakemore Tube for Bleeding Varices - YouTube

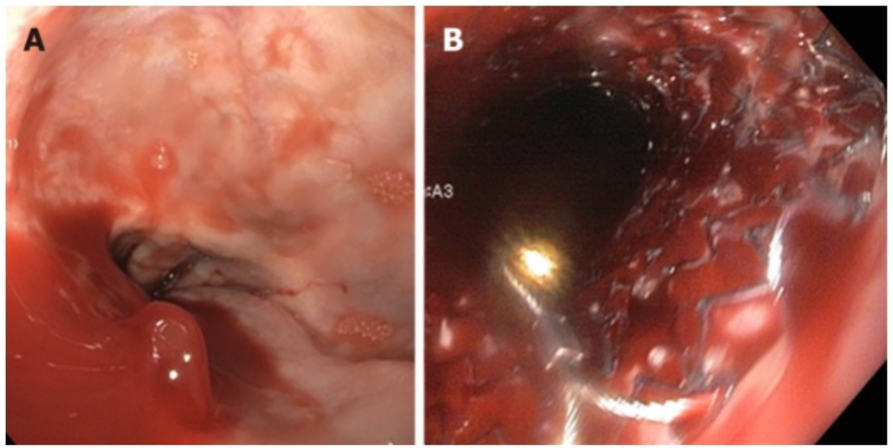


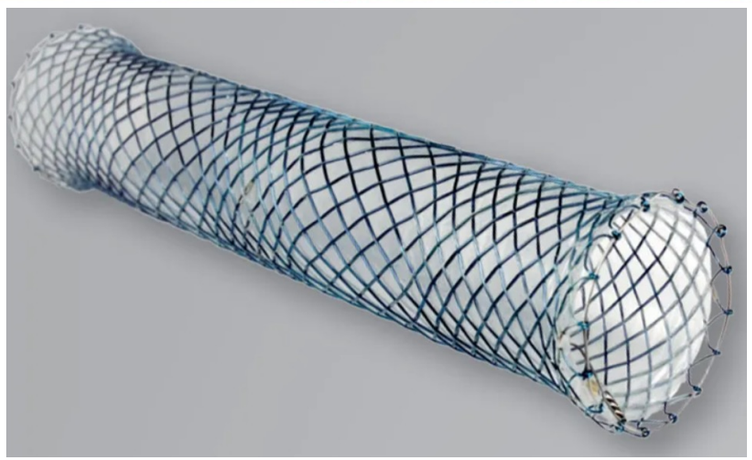
Only inflate esophageal balloon if necessary;
Inflate to target pressure (not volume)

Placement of a Blakemore Tube for Bleeding Varices - YouTube

Placement of a Blakemore Tube for Bleeding Varices - YouTube

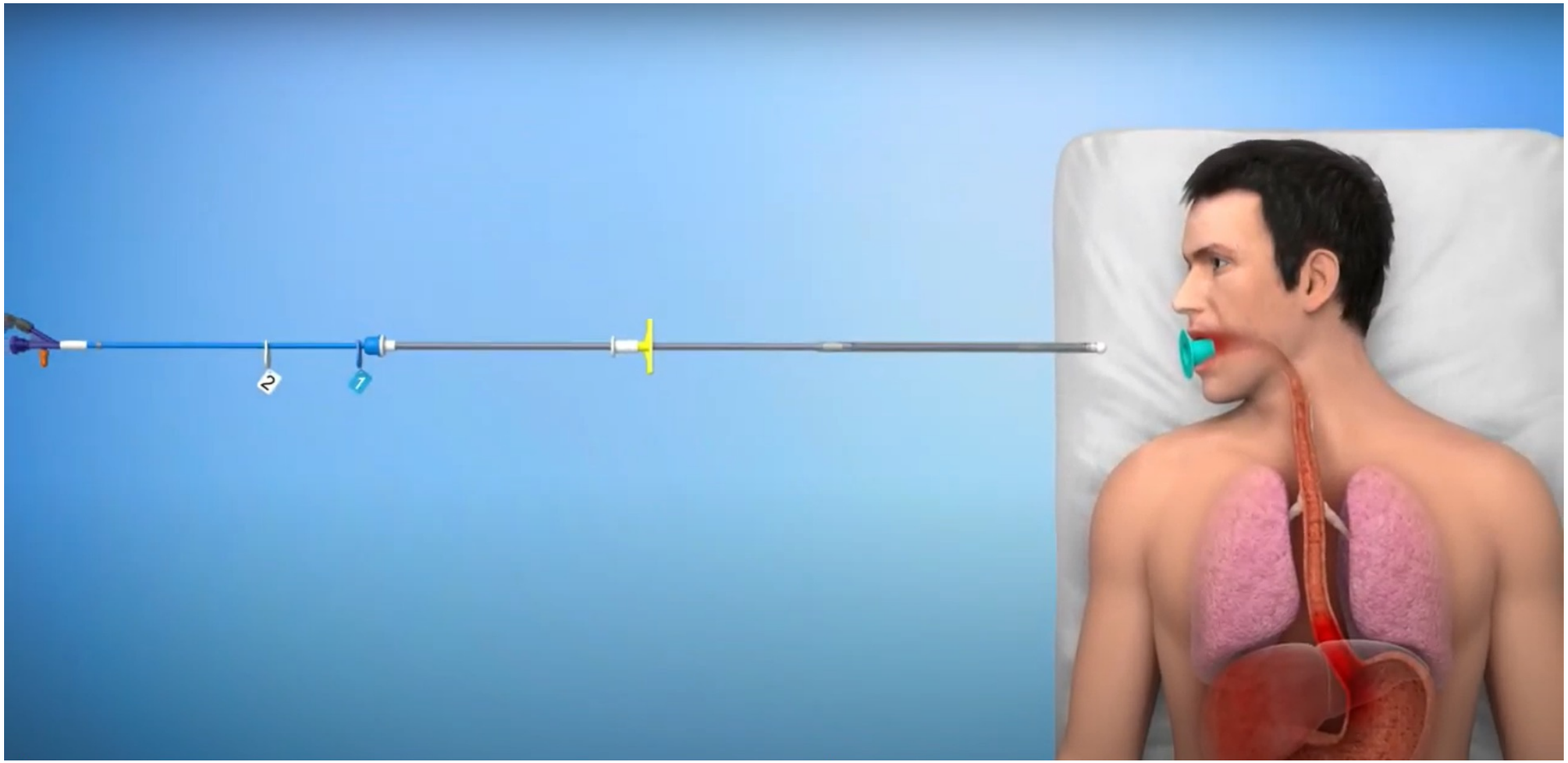
SPOTLIGHT: ESOPHAGEAL STENT (BRIDGE)



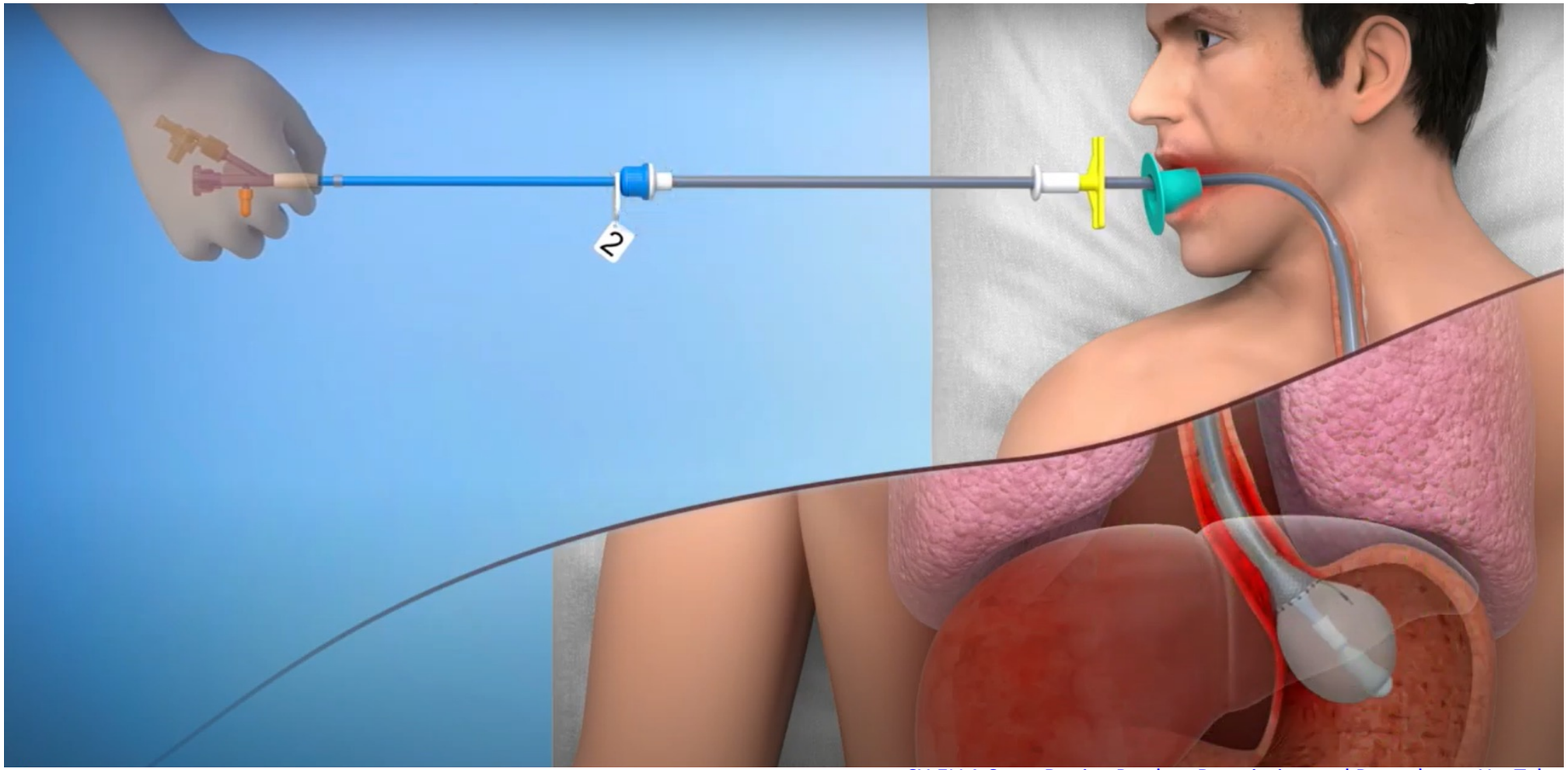


- RCT: in refractory acute EV bleeding, self-expandable esophageal covered metal stents (SEMS) had greater efficacy (66%) and less serious adverse events (15%) compared to balloon tamponade therapy (efficacy 20%, SAE 47%)
- This particular stent is currently unavailable in the US, although other through-the-scope esophageal stents are being used
- Some expert centers now favor esophageal stents over balloon tamponade therapy for refractory variceal bleeding

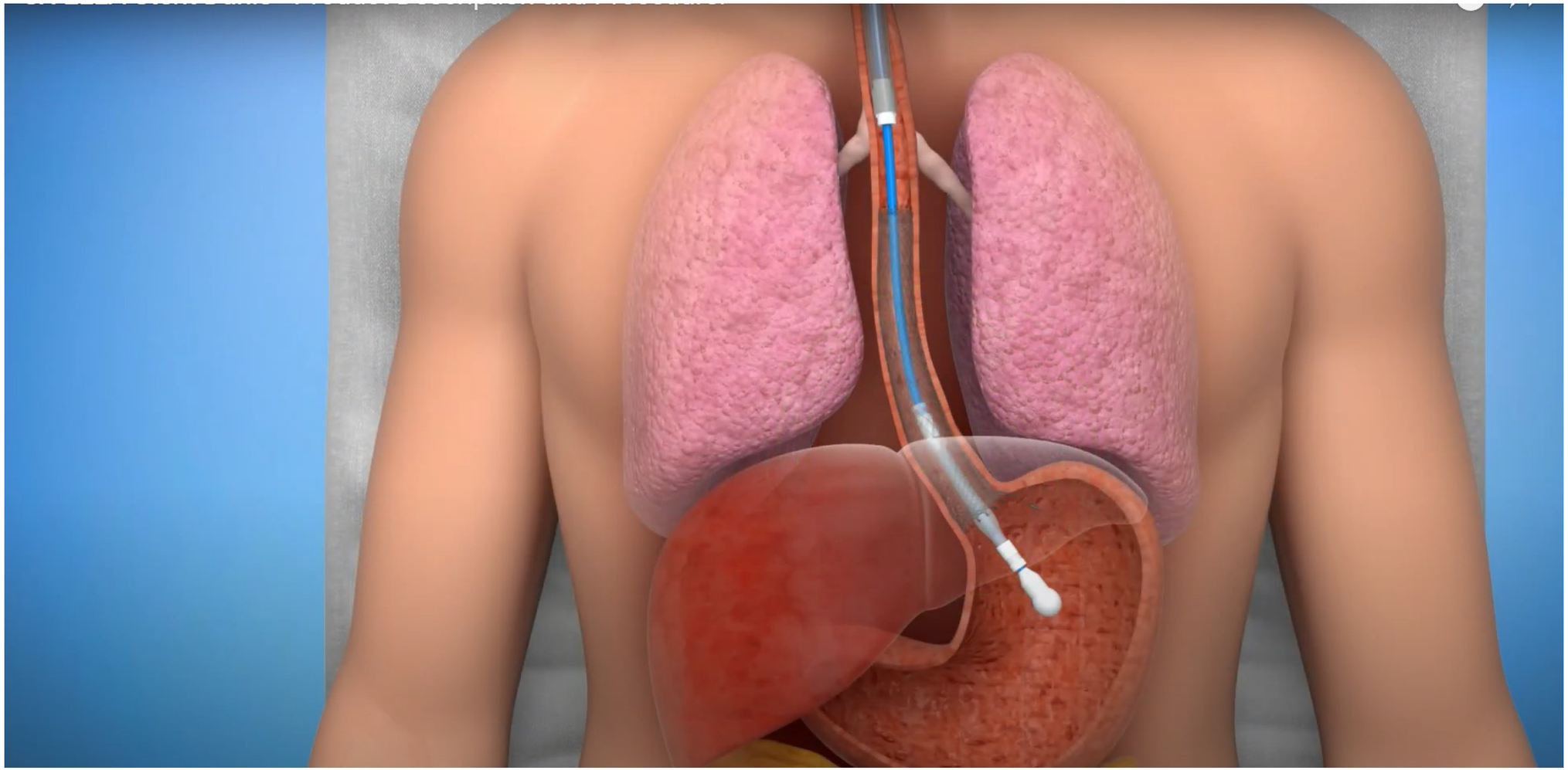
Escorsell A, et al. Hepatology 2016;63:1957-67



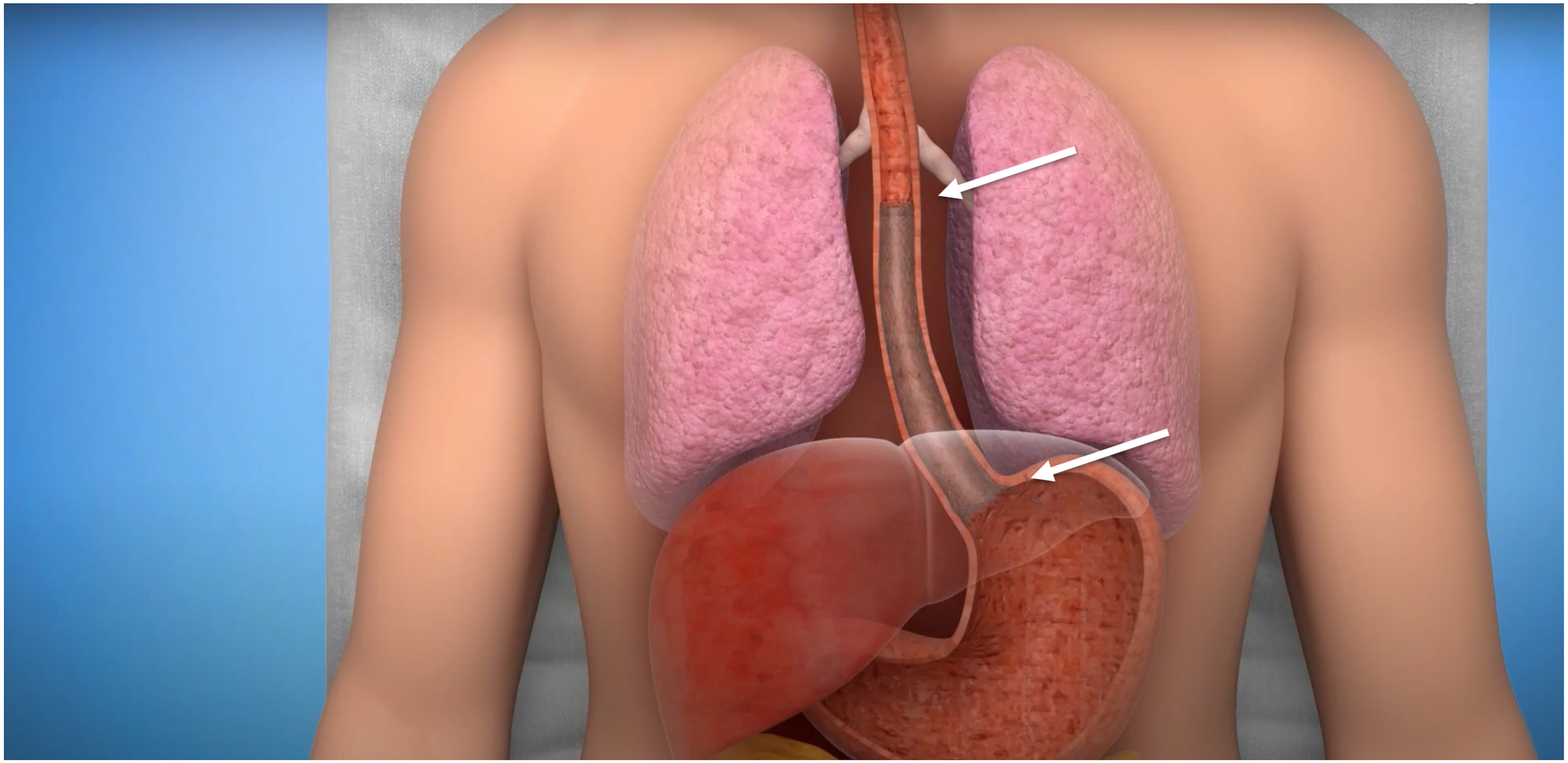
SX-ELLA Stent Danis - Product Description and Procedure. - YouTube



SX-ELLA Stent Danis - Product Description and Procedure. - YouTube



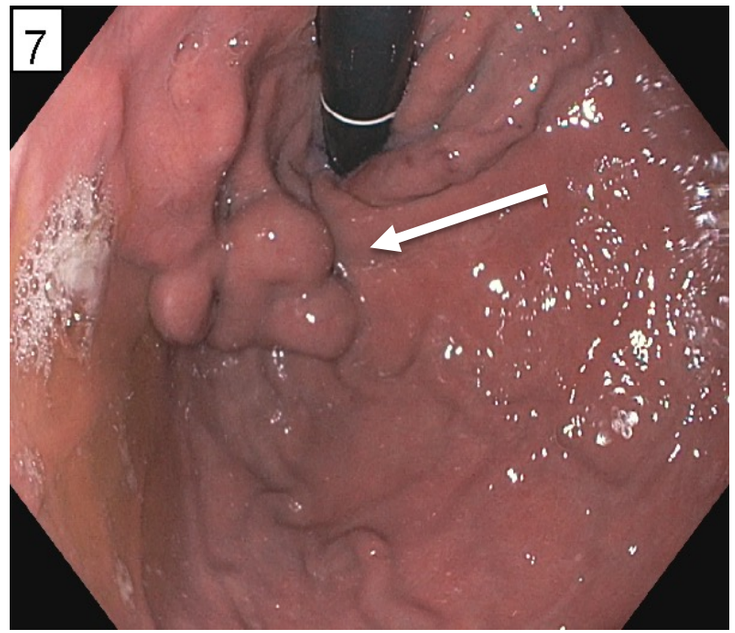
SX-ELLA Stent Danis - Product Description and Procedure. - YouTube



SX-ELLA Stent Danis - Product Description and Procedure. - YouTube

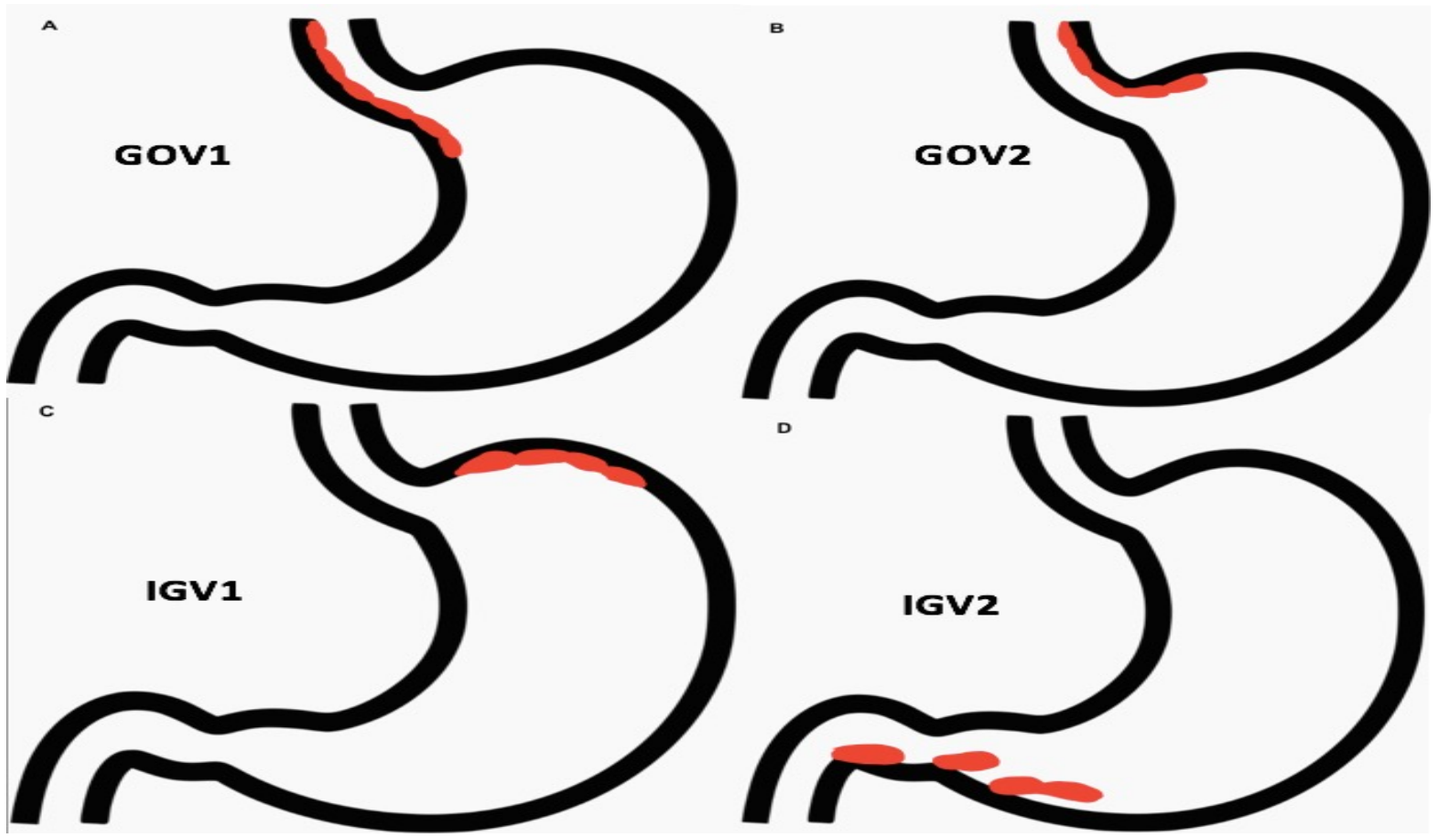
ACUTE GASTRIC VARICEAL (GV) BLEED

- 10-20% of all Variceal bleeding
- Higher risk of bleeding and more severe bleeding
- High mortality rates
- Fewer well established guidelines
- Most common cause: Portal Hypertension, although can occur with splenic venous thrombosis



Bazarbashi AN, Ryou M. Current Opinions in Gastroenterology 2019.

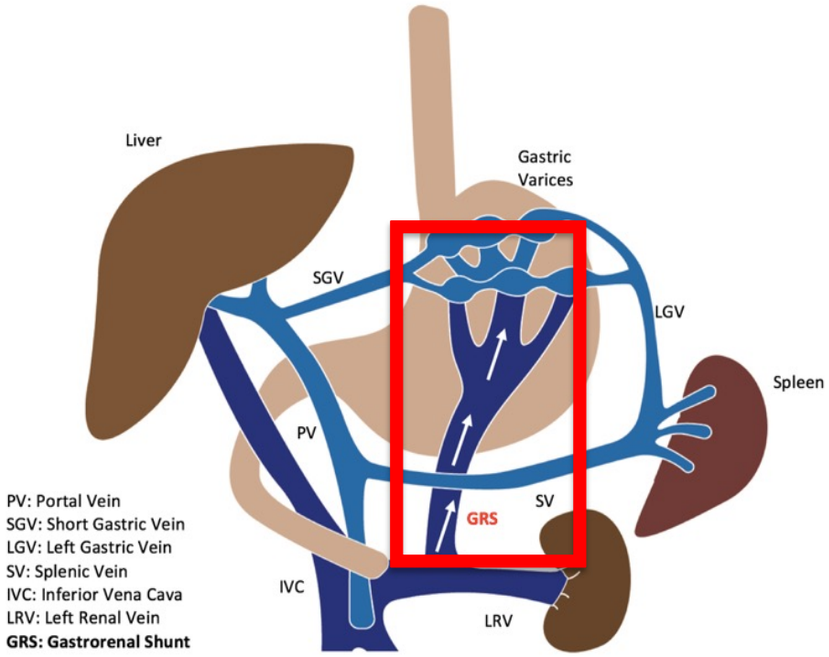
GV CLASSIFICATION



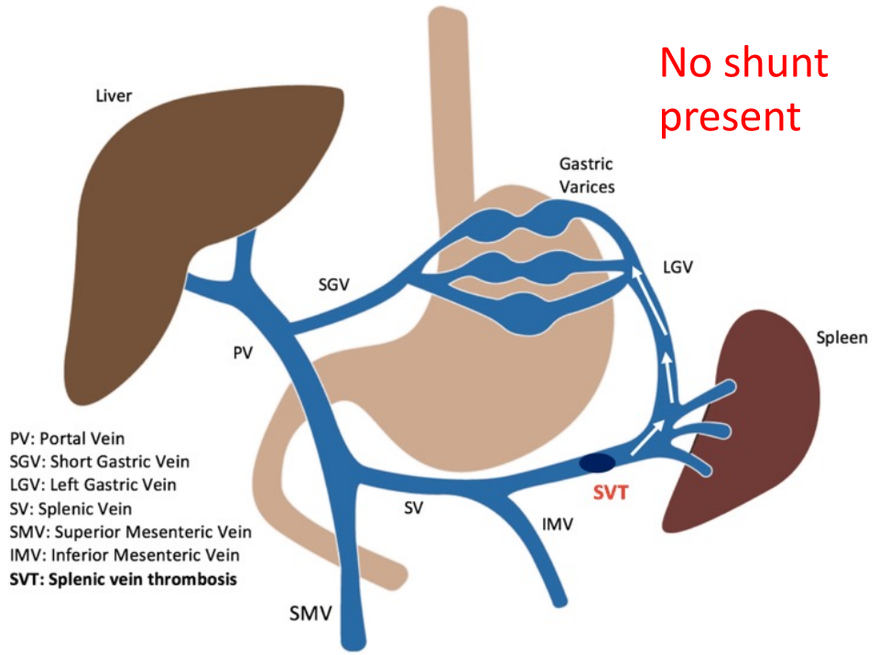
Bazarbashi AN, Ryou M. Current Opinions in Gastroenterology 2019.

ETIOLOGIES OF GASTRIC VARICES

GV in the setting of portal hypertension



GV in the setting of splenic vein thrombosis



Bazarbashi AN, Ryou M. Current Opinions in Gastroenterology 2019.
Bazarbashi AN, Ryou M. ACG Case Report Journal. 2019

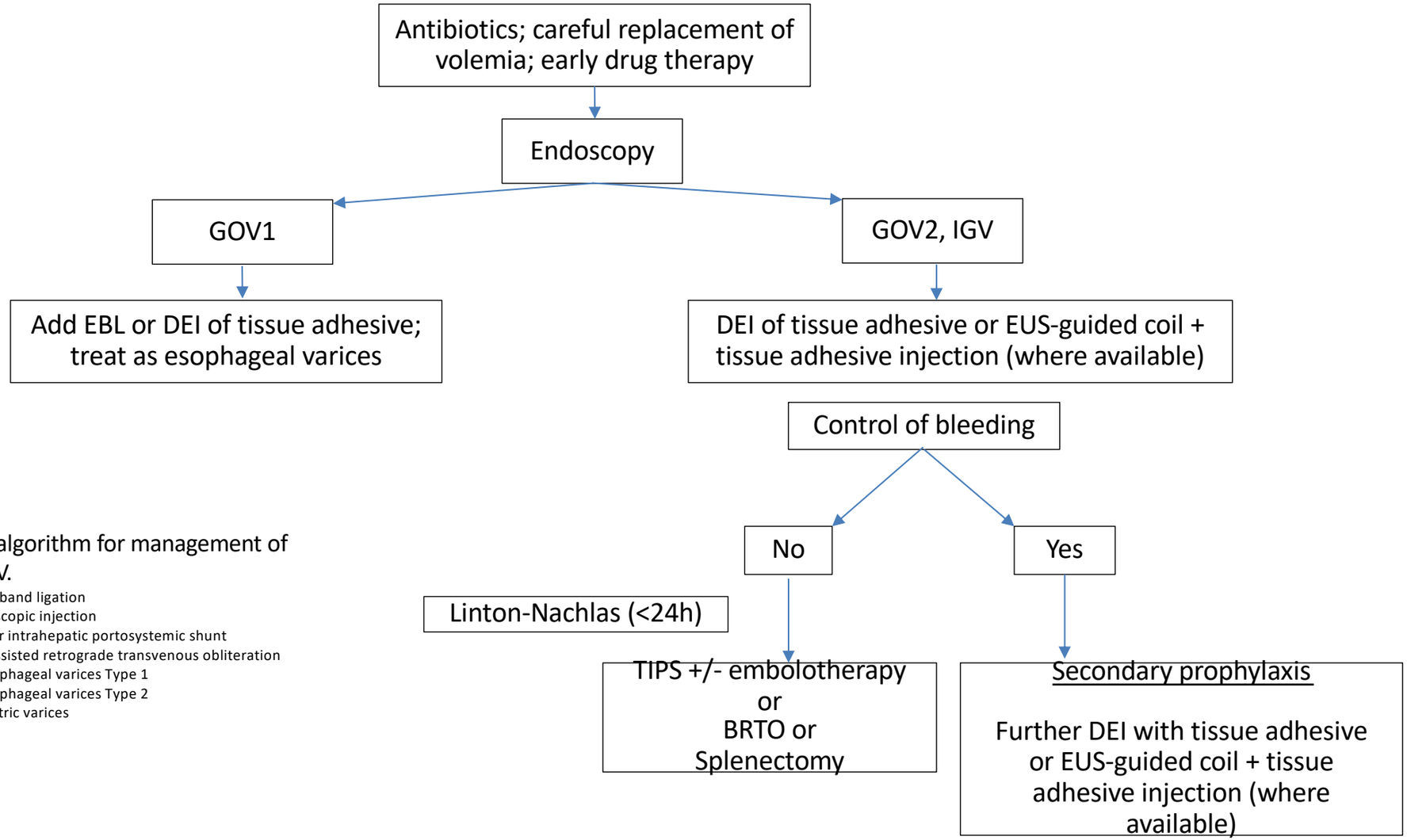
ACUTE GV BLEED: MANAGEMENT

- Hgb goal 7-9 g/dL (restrictive)
- Ceftriaxone 1 g daily→ max of 7 days
- Octreotide → data not available

- **Endoscopy within 12h to diagnose and potentially treat**
- **Traditional endoscopic Rx = glue injection**
- **However, if offered, EUS-guided injection therapies is preferred endoscopic therapy**
- **If recurrent bleeding and/or HD unstable→ IR (TIPS or BRTO)**

ASGE clinical guidelines on variceal bleeding. 2014
Bazarbashi AN, Ryou M. Current Opinions in Gastroenterology 2019.
Bazarbashi AN, Ryou M. ACG Case Report Journal. 2019
Bazarbashi AN et al. Endoscopy International Open. 2019

Bleeding Gastric Varices (GV)



Figure

Suggested algorithm for management of bleeding GV.

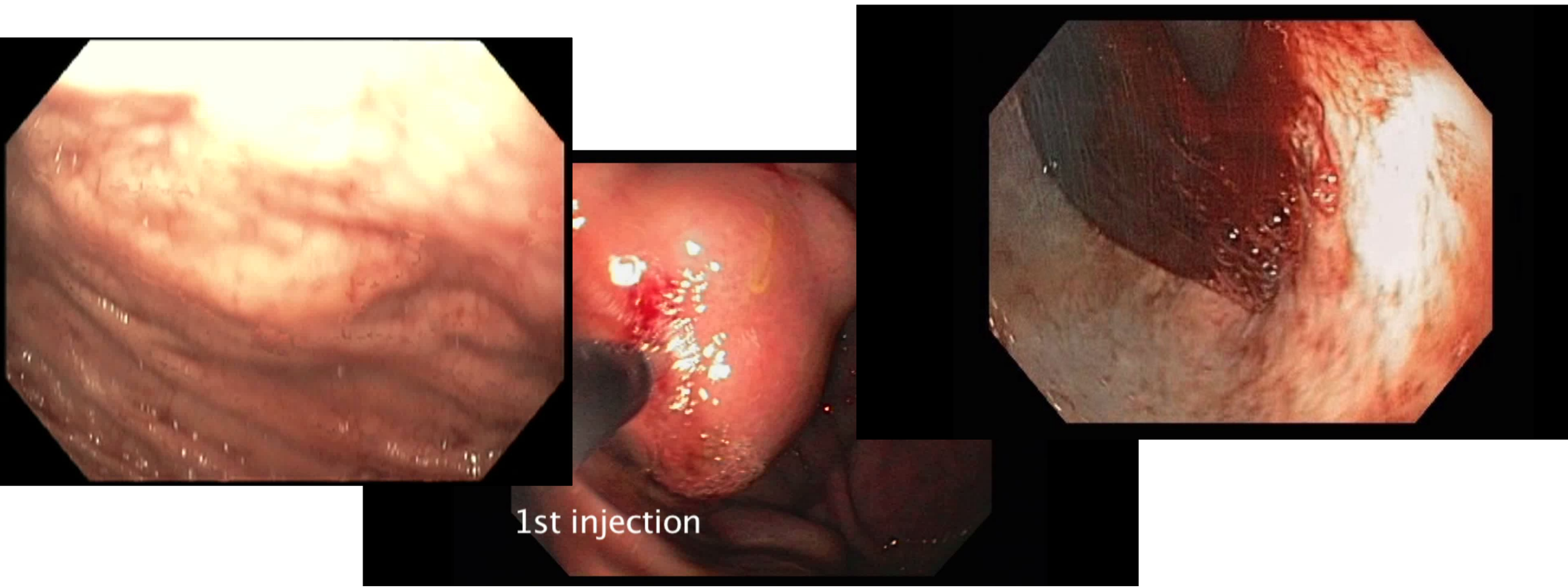
EBL=endoscopic band ligation
DEI=direct endoscopic injection
TIPS=transjugular intrahepatic portosystemic shunt
BRTO=balloon assisted retrograde transvenous obliteration
GOV1=gastroesophageal varices Type 1
GOV2=gastroesophageal varices Type 2
IGV=isolated gastric varices

ENDOSCOPIC VARICEAL GLUE INJECTION

- Endoscopic management of GV has been premised on synthetic glue injection, such as cyanoacrylate (CYA) or histoacryl
- Glue can be injected directly or under EUS guidance
- Hemostasis 93-100%; rebleed 10-30%
- GV obliteration 36-91%
- Problems ? Embolization, de-roofing varices, risk of re-bleeding

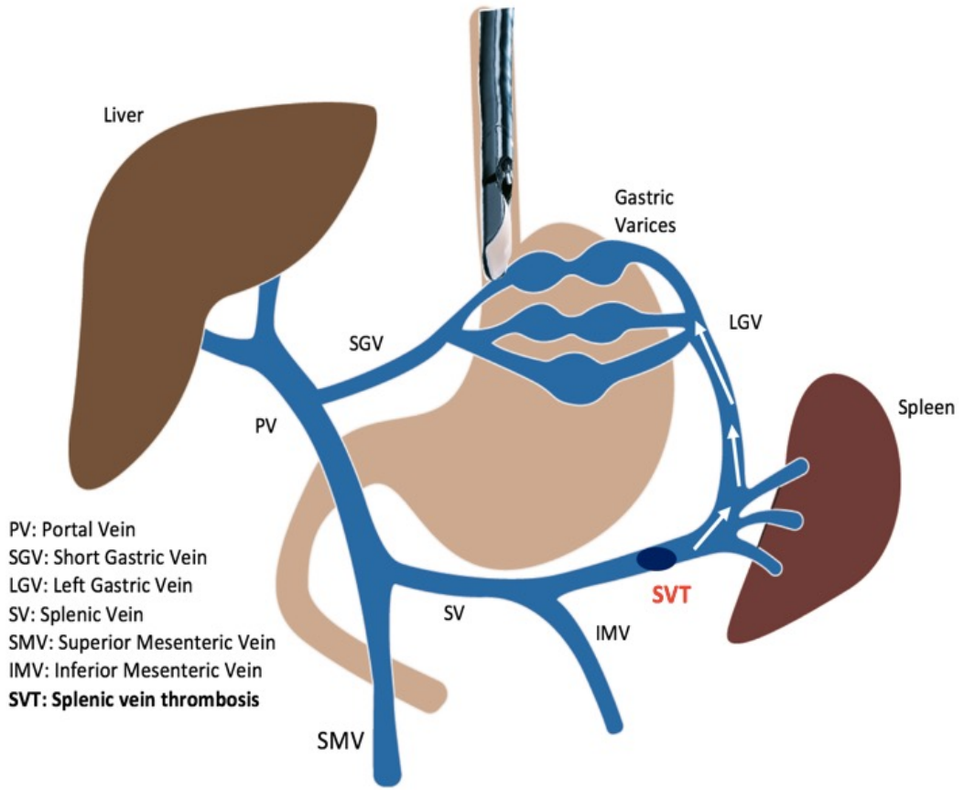
Oh Saek Eeh et al. World J Gastro. March 2015
Wolfgang Lee at al. JAMA Surgery. 2019

ENDOSCOPIC VARICEAL GLUE INJECTION

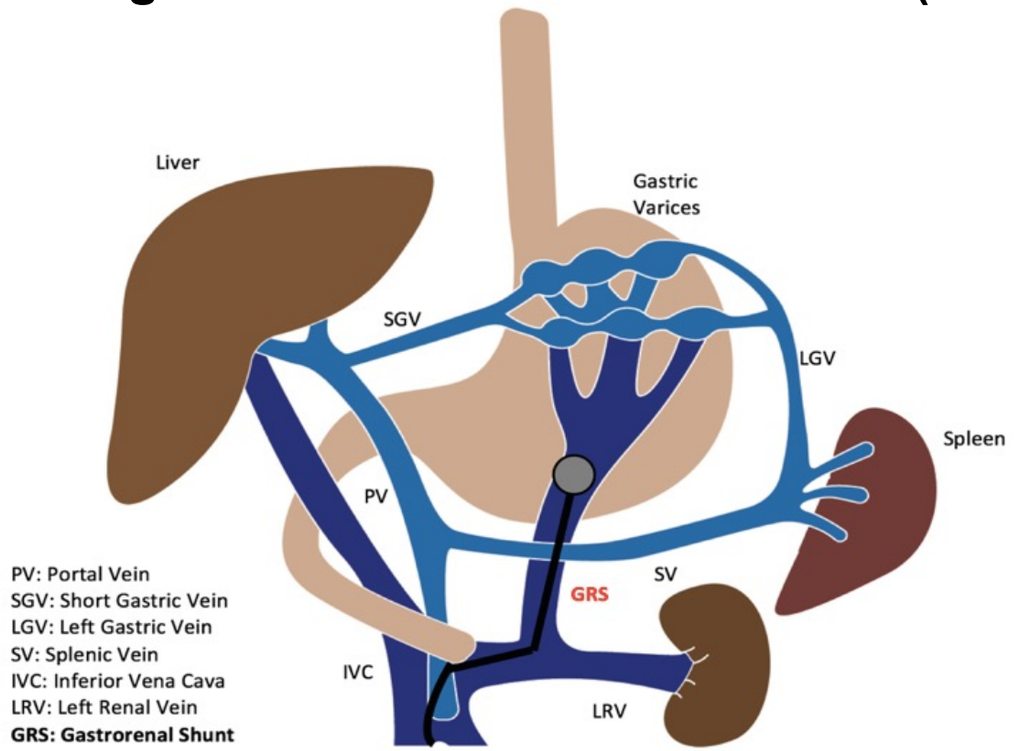


EMERGING OPTIONS: EUS AND BRTO

EUS guided treatment



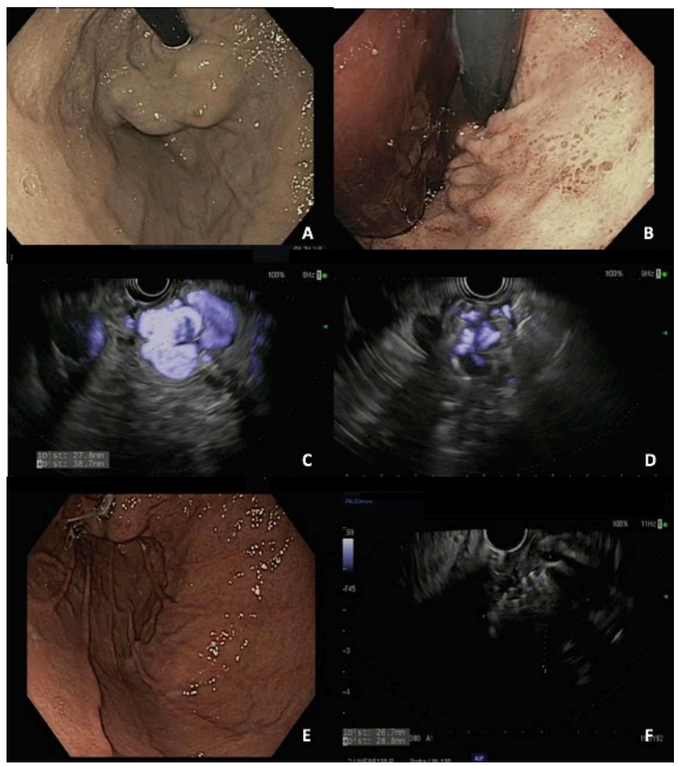
Balloon Retrograde Transvenous Obliteration (BRTO)



Bazarbashi AN, Ryou M. Current Opinions in Gastroenterology 2019.
Bazarbashi AN, Ryou M. ACG Case Report Journal. 2019

SPOTLIGHT: ENDOSCOPIC ULTRASOUND (EUS) GUIDED TREATMENT OF GASTRIC VARICES

- EUS coiling + glue
- EUS allows direct intravariceal delivery of hemostatic agents
- Doppler provides real-time feedback about hemostasis



Bazarbashi AN et al. Endoscopy International Open. 2019

ENDOSCOPIC ULTRASOUND (EUS)-GUIDED TREATMENT OF GASTRIC VARICEAL BLEED

Ge PE, Bazarbashi AN et al. VidGIE 2018

SUMMARY: ACUTE VARICEAL BLEED

- ✓ Antibiotics, vasoactive medications, careful replacement of volemia
- ✓ Endoscopy within 12 hours:
  - ✓ For EV, band ligation or sclerotherapy is preferred
  - ✓ For GV, glue injection is gold standard but EUS-guided injection therapies (where available) may be superior
- ✓ In case of refractory bleeding:
  - ✓ For EV: esophageal stent (where available) is preferred over balloon tamponade as bridge to TIPS
  - ✓ For GV: BRTO or TIPS depending on anatomy

LOWER GI BLEED

LOWER GI BLEEDING (LGIB)

- Accounts for 20% of all GIB
- Most LGIB stop spontaneously with favorable outcomes but morbidity & mortality increased in older patients with comorbidities
- Colonoscopy should be initial diagnostic and potentially therapeutic procedure for all hemodynamically stable LGIB

Strate et al Am J Gastro 2016
Green et al Am J Gastro 2005
Laine et al Am J Gastro 2010

CAUSES OF LOWER GI BLEEDING (LGIB)

- Diverticulosis (20-65%)
- Neoplasia (1-17%)
- Ischemic colitis (1-19%)
- Angiodysplasia (3-15%)
- Hemorrhoids (5-10%)
- Post-polypectomy (2-6%)
- UGI source (11-15%)
- Inflammatory bowel disease
- Infectious colitis
- NSAID
- Radiation
- Diuelafoy's
- Rectal varices
- Small bowel source
- Unknown (12%)

TIMING OF COLONOSCOPY

- In hemodynamically stable patients, colonoscopy recommended <u>at some point during hospitalization because there is no high quality evidence that early colonoscopy influences outcomes</u>
  - RCT: 100 pts with acute LGIB randomized to urgent colonoscopy (within 8 hours) vs standard of care showed significantly improved definitive diagnoses (42% vs 22%) but not rebleeding, surgery, or LOS
  - RCT: 72 patients with acute LGIB randomized to urgent colonoscopy (within 12 hours) vs 30-60 hours showed no differences in rebleeding, diagnoses or need for therapy between groups
- **<u>No role</u>** for **<u>unprepped</u>** colonoscopy/sigmoidoscopy

Konstantinos, et al. Endoscopy 2021
Strate et al Am J Gastro 2016
Green et al Am J Gastro 2005
Laine et al Am J Gastro 2010
Tsay et al, Clin Gastro Hep 2020

TRANSFUSIONS/ ANTITHROMBOTIC MANAGEMENT

- 2021 ESGE Guidelines for LGIB recommendations:
  - Similar restrictive RBC transfusion strategy (<7g/dL); more liberal strategy (<8g/dL) for history of acute/chronic cardiovascular disease
  - Similar management of antithrombotic management

Konstantinos, et al. Endosccopy 2021

DIFFERENTIATING UPPER VS LOWER SOURCE

- 10-20% of "LGIB" have UGI source
- Clues to UGIB: hematochezia with hemodynamic instability, h/o UGIB, elevated BUN (BUN/Cr > 30 → UGIB)
- Nasogastric Tube NOT routinely recommended

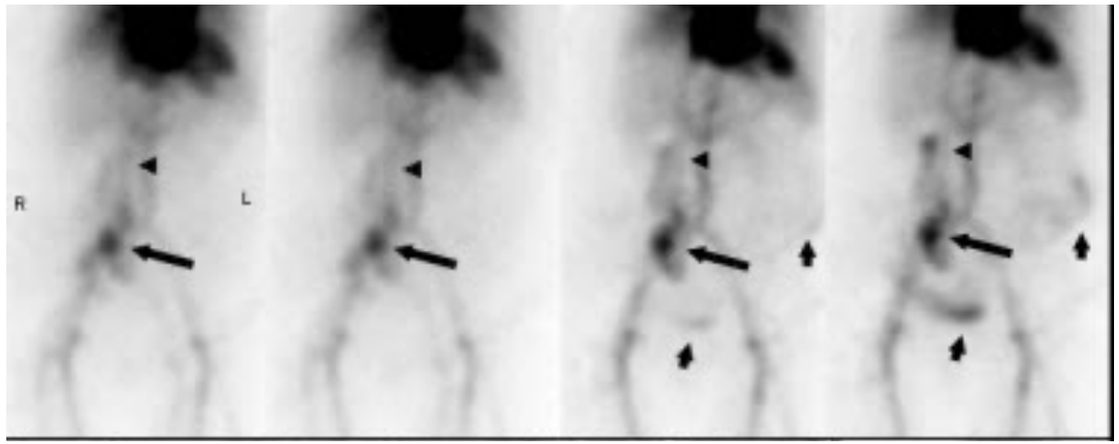
NGT aspirate to predict UGIB

Sensitivity	Specificity	PPV	NPV
42-84%	55%	32-45%	80-85%

  - UGIB randomized NGT vs no NGT: no difference in MD's ability to predict high-risk lesion requiring therapy (39% vs 38%)

Huang ES et al. Gastrointest Endosc 2011
Rockey D et al J Invest Med 2017

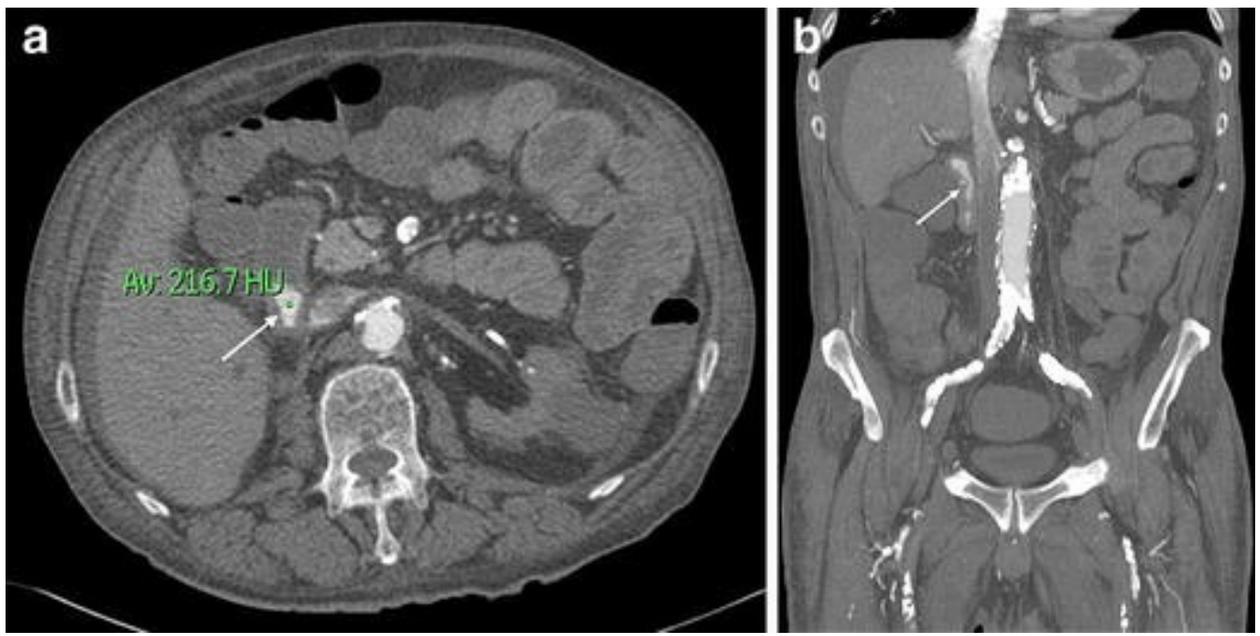
TAGGED RBC SCAN



- >0.1 mL/min
- (99Tcm) pertechnetate-labelled RBC (24h)
- Sensitivity 78-97%
- Specificity 70-100%
- 24-91% accurate localization
- Logistical considerations
- Being replaced by CTA in recommended treatment algorithm

Krevsky. GIE Clin N Am 1997.
Dusold et al. Am J Gastro 1994
Zuckier et al. Radiol Clin N Am 2003.
Currie et al. J Clin Gastro 2011.

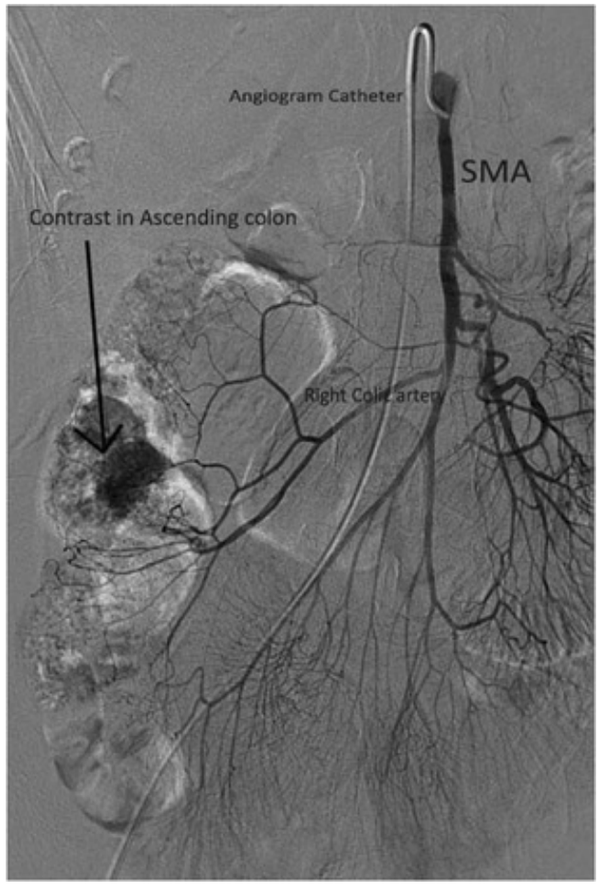
MULTIDETECTOR CT ANGIOGRAPHY



- >0.3-0.5 mL/min
- For acute bleeding
  - Sensitivity 79-95%
  - Specificity 95-100%
- For obscure GI bleeding
  - Sensitivity 45-47%
  - Specificity 92-95%
- Increase diagnostic yield of colonoscopy by 15%
- Higher precision and correlation with angiography findings than tagged RBC
- More readily available than tagged RBC

Marti et al Radiology 2012
Geffroy et al Radiographics 2011
Chan et al Cardio Int Rad 2014
Nagata et al J GI 2015
Fuerstein et al AJR 2016

ANGIOGRAPHY EMBOLIZATION



- >1 mL/min
- Ideally within 1 hour after CTA
- Angiography without scan
  - Hemodynamically unstable
  - Severe bleeding
- 60% sensitivity; 100% specificity
- Hemostasis: 40-100% of diverticular bleeding; rebleeding 0-50%
- Embolization with superselective microcatheter (arteries <1mm)
- Risk of embolization induced bowel ischemia 1-4%

Funaki. Abd Imaging 2004.
DeBarros et al. Dis Colon Rectum 2002.
Maleux et al. Am J Gastro 2009.

LGIB: OVERALL APPROACH

Low-risk LGIB, Stable	Ongoing LGIB, Stable	Severe LGIB, Unstable
Colonoscopy (Outpatient vs Inpatient)	Consider Upper Source CT Angio Tagged RBC scan no longer recommended	Exclude Upper Source Angiography Consider surgery

SUMMARY: LOWER UPPER GI BLEED

- Similar transfusion guidelines and anti-thrombotic management recommendations as UGIB
- Prepped colonoscopy as initial evaluation for stable LGIB at some point in hospitalization; urgent colonoscopy has not been shown to improve outcomes
- Otherwise rule out UGIB and CTA or Angio for unstable LGIB (Tagged RBC scan no longer recommended)

QUESTION 1:

A 56 year old man with history of cirrhosis is admitted to the ICU with large-volume hematemesis. Do all of the following EXCEPT:

A) Give antibiotics (e.g. Ceftriaxone)
B) Call GI for urgent endoscopy
C) Start vasoactive medication (e.g. octreotide)
D) Administer FFP to reverse INR
E) Transfuse for goal HgB 7-9 g/dL (restrictive transfusion strategy)

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QUESTION 2:

The following bleeding etiologies are correctly paired with endoscopic and endovascular therapies EXCEPT:

1) Peptic ulcer bleed and Over-the-Scope Clip
2) Diverticular bleed and Hemospray
3) Esophageal variceal bleed and Esophageal Stent
4) Gastric variceal bleed and BRTO
5) Esophageal variceal bleed and Endoscopic Band Ligation

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