We're Going to Need a Bigger Band: Challenges in Management of Variceal Hemorrhage

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NCSG Annual Meeting 2023
Saturday, February 18th, 2023

Disclosures

- I have no relevant financial disclosures

- I will be discussing off-label use of products for variceal bleeding
  - Hemospray
  - Self-Expanding Metal Stents

Overview/Roadmap

- Basics of Variceal Bleeding Management
- Challenges with Bleeding Esophageal Varices
- Management of Bleeding Gastric Varices

Case Presentation: Unfortunate Billy Rubin

- 52 year old M with known alcohol-related cirrhosis who presents to the ED with hematemesis
- Relapse into drinking after UNC lost to Duke the other night
- Clinical Data:
  - HR 103, BP 105/76
  - Hgb down to 9, baseline 11-12
  - A&O x 3 currently

Preparing for Endoscopy

Vasoactive Agents

- Octreotide 50 mcg bolus → 50 mcg/hr infusion
- Brief, but large ↓ in portal pressure

Antibiotics

- Ceftriaxone 1g IV q24 hours
- Reduces all cause mortality, re-bleeding and bacterial infections

Restrictive Transfusions

- Goal Hgb > 7 g/dL
- No routine correction of INR or PLT

PPI Infusion

- 30% of UGIB in cirrhosis is PUD
- Otherwise, not helpful

Other

- Erythromycin for stomach purge/improve visualization
- Intubate for airway protection

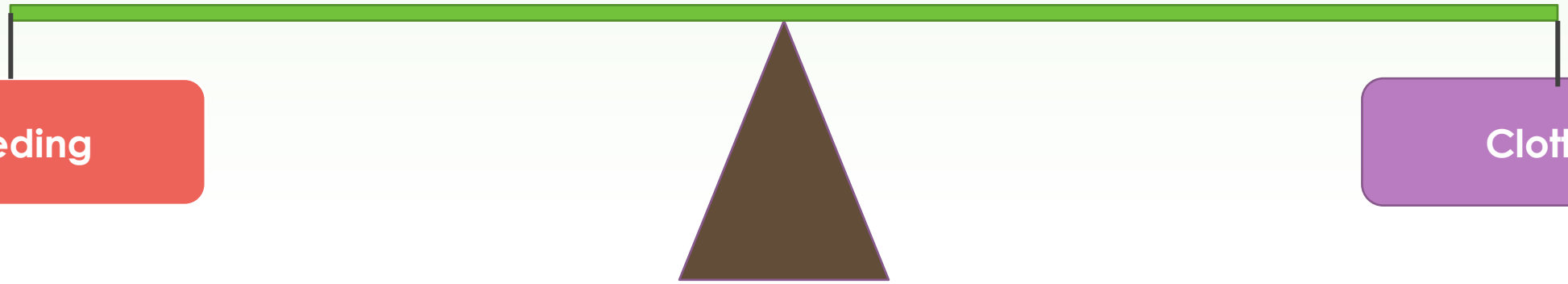
Adapted from Liver Fellow Network: Quick Tips July 29, 2020

Re-Balanced Hemostasis in Cirrhosis

- Low Levels of F II, V, VII, IX, X, XI
- Thrombocytopenia
- Low Fibrinogen

Traditional laboratory measures of hemostasis, such as PT/INR, aPTT, and platelet count are not reliable!

- Low Levels of Protein C/S and ATIII
- Elevated levels of vWF
- Elevated Factor VIII



Bleeding

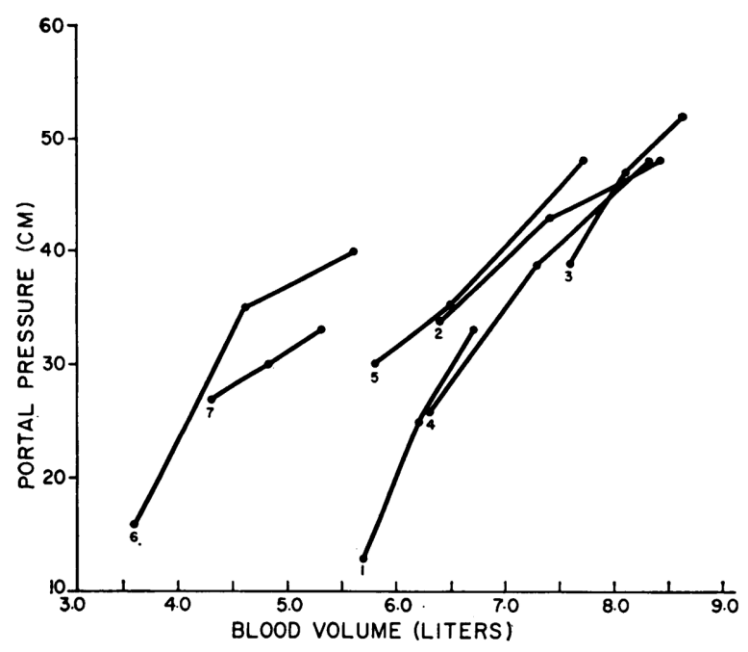
Clotting

Don't Give Routine FFP, Cryo or PLT

Gut, 1974, **15**, 99-101

The portal pressure-blood volume relationship in cirrhosis[1]

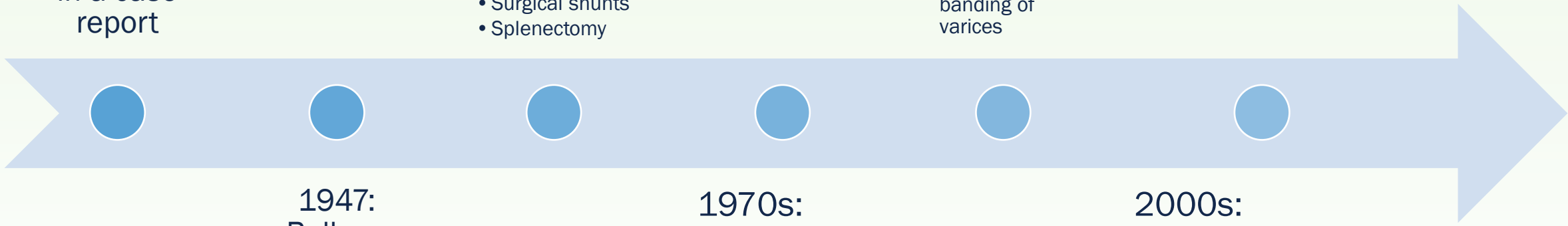
DAVID S. ZIMMON AND RICHARD E. KESSLER



~500 mL of blood products can <u>DOUBLE</u> the portal pressure

- 2 units of FFP
- ~1.5 units of PLT
- ~5 bags of cryo

Evolution of Therapy for Variceal Bleeding



1939: Quinine for sclerotherapy in a case report

1947: Balloon Tamponade

Pre-1970s: Surgery prevails

- Esophagectomy
- Surgical shunts
- Splenectomy

1970s: Endoscopic therapy

- Alcohol sclerosis

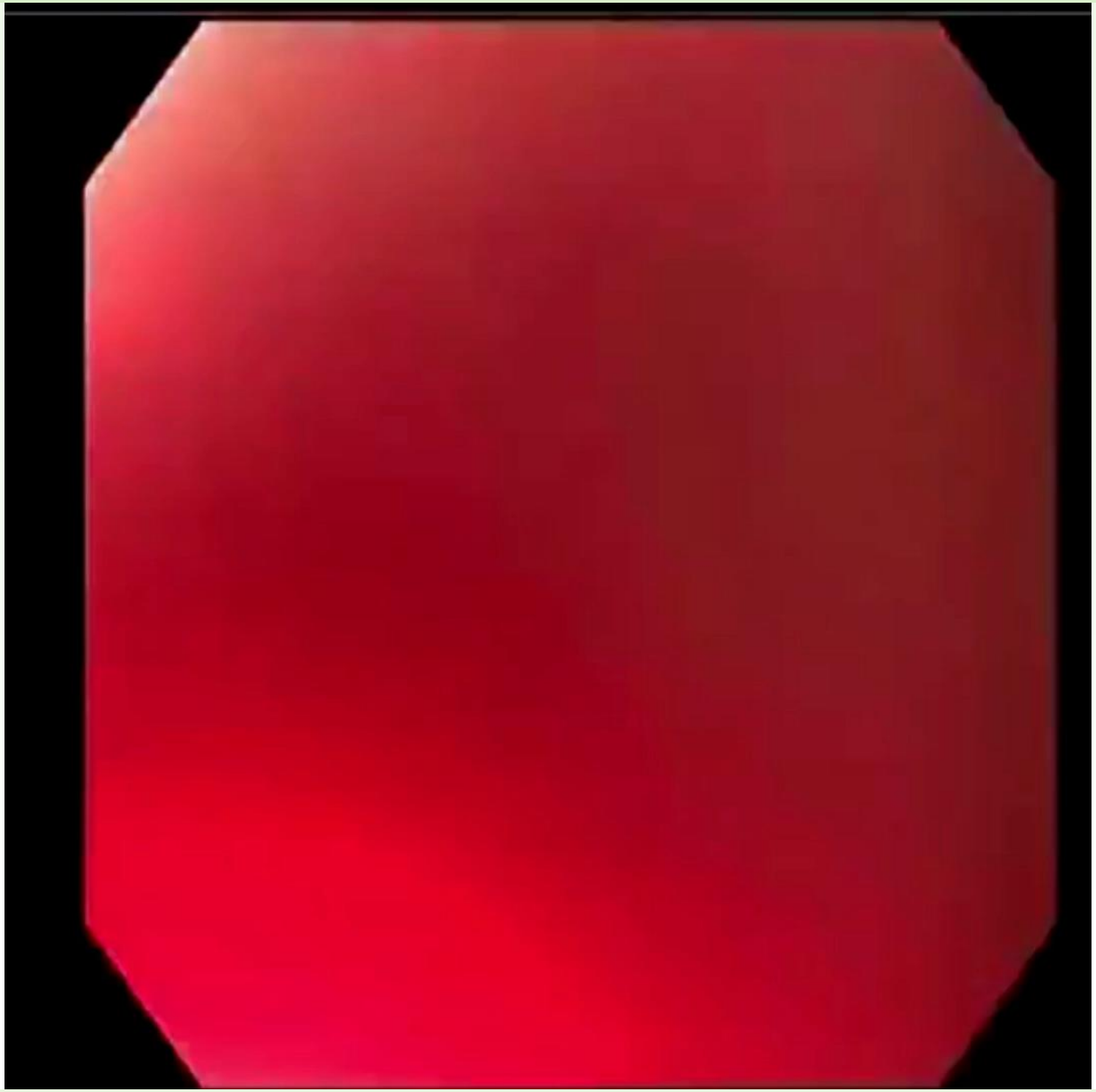
1980s: Innovation

- 1983: First TIPS
- 1987: First banding of varices

2000s: Improvement and Beyond

- 2003: BRTO done in Japan
- 2006: Esophageal stents
- 2007: EUS-guided gluing
- 2013: Hemospray

World J Gastroenterol. 2014

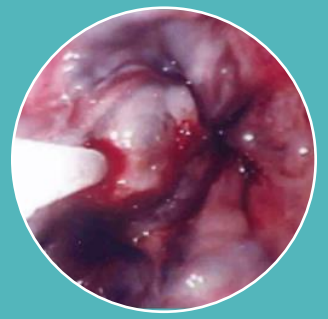


ADAPTED FROM DR. FATEH BAZERBACHI

Back to Unfortunate Billy Rubin

“Basic” Toolbelt for Gastroenterologists

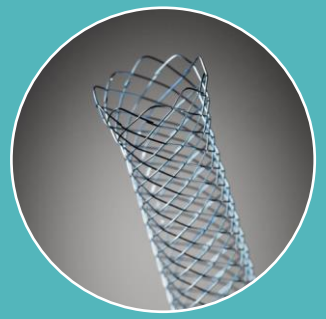
EVL



Sclerotherapy

Balloon Tamponade

"Advanced" Tools to Help Stop Bleeding



Self-Expanding Metal Stents

Hemospray

Endoclips

TIPS

Sclerotherapy

- Tissue irritants that cause vascular thrombosis and endofibrosis
- Directly injected into varix
  - Para-variceal injection less effective
- Typically delivered with 23-gauge needle

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ADAPTED FROM DR. FATEH BAZERBACHI

Sclerotherapy Agents

Agent	Volume, mL per site/mL per session	Relative Tissue Injury	Pertinent Facts
Sodium Tetradecyl Sulfate (1% and 3%)	1-2/10	++	1% for small varices, 3% for large varices
Ethanolamine Oleate 5%	1.5-5/20	+++	
Sodium Morrhuate 5%	0.5-5/15	+++	Fishy odor, make sure particles are dissolved before using
Ethanol 99.5%	0.5-1/4	++++	Most corrosive

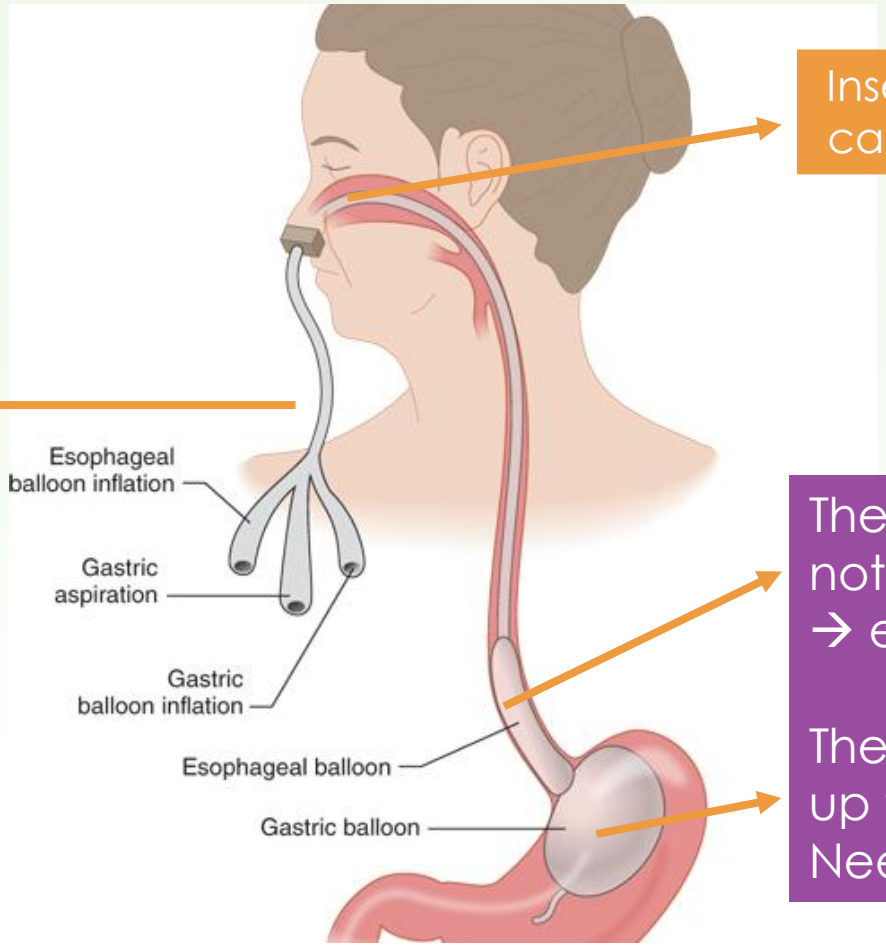
Adverse Events: Mucosal ulceration, esophageal strictures, perforation, mediastinitis, pleural effusion, bronchoesophageal fistula, ARDS and infection

ASGE Technical Report (GIE 2007, 66(1))

Balloon Tamponade

Inserted through nasal cavity, but can also be done through mouth

Tube held with tension (i.e. saline bag or helmet)



The esophageal balloon should not be up for more than 6 hours → esophageal necrosis

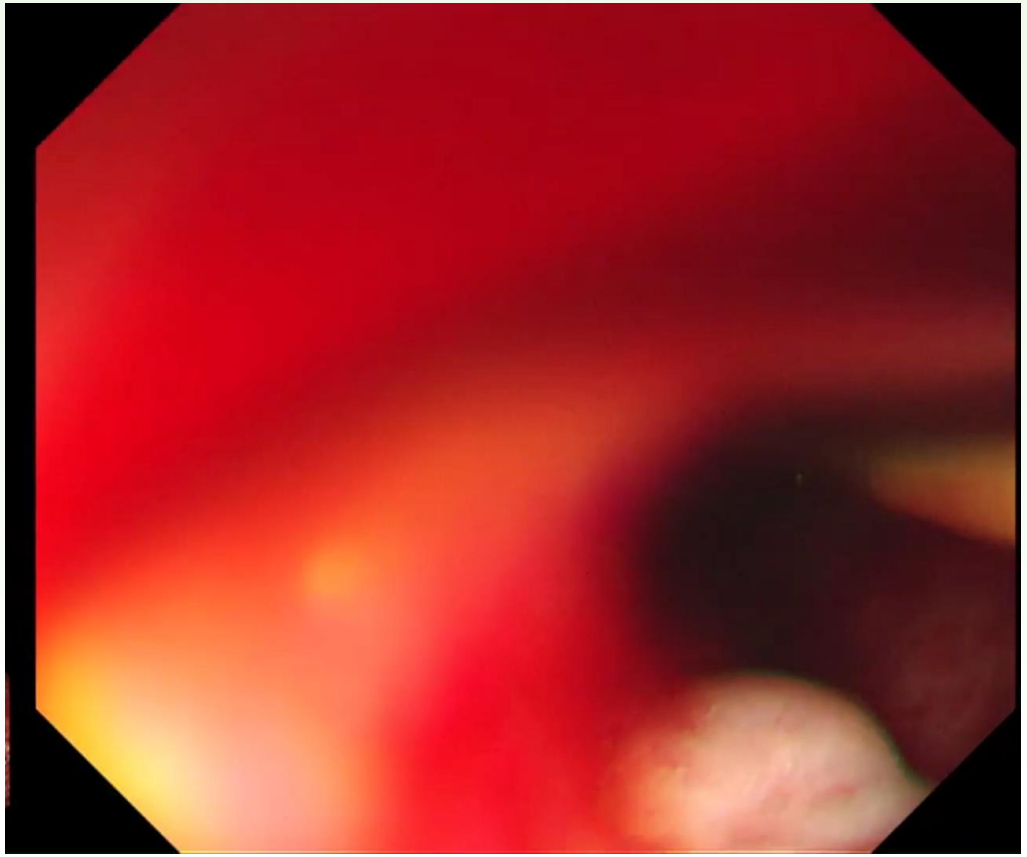
The gastric balloon should not be up for more than 24 hours → Need a plan B!

Self-Expanding Metal Stents (SEMS)

- First described in Austria in 2006 for AVB
- Mitigate risks of balloon tamponade
  - Esophageal necrosis/ulceration
  - Tongue/nose/lip necrosis
  - Aspiration pneumonia
- Can remain in place longer
  - Up to 14 days
  - 50% of patients with balloon tamponade re-bleed after deflating at 24 hours

SEMS Placement for EV Bleed

- EVB specific SX-Ella Danis stent not FDA approved
  - 135 mm L x 25 mm W fully covered
- In US, use similar option
  - 125 mm L x 28 mm W fully covered available
  - Need larger working channel to deploy endoscopically; otherwise perform over stiff wire with fluoro
- Removal can be traumatic → Have a backup plan!



Adapted from YouTube: User Mostafa Ibrahim

SEMS vs. Balloon Tamponade

15-day "free from treatment failure"

6-week survival

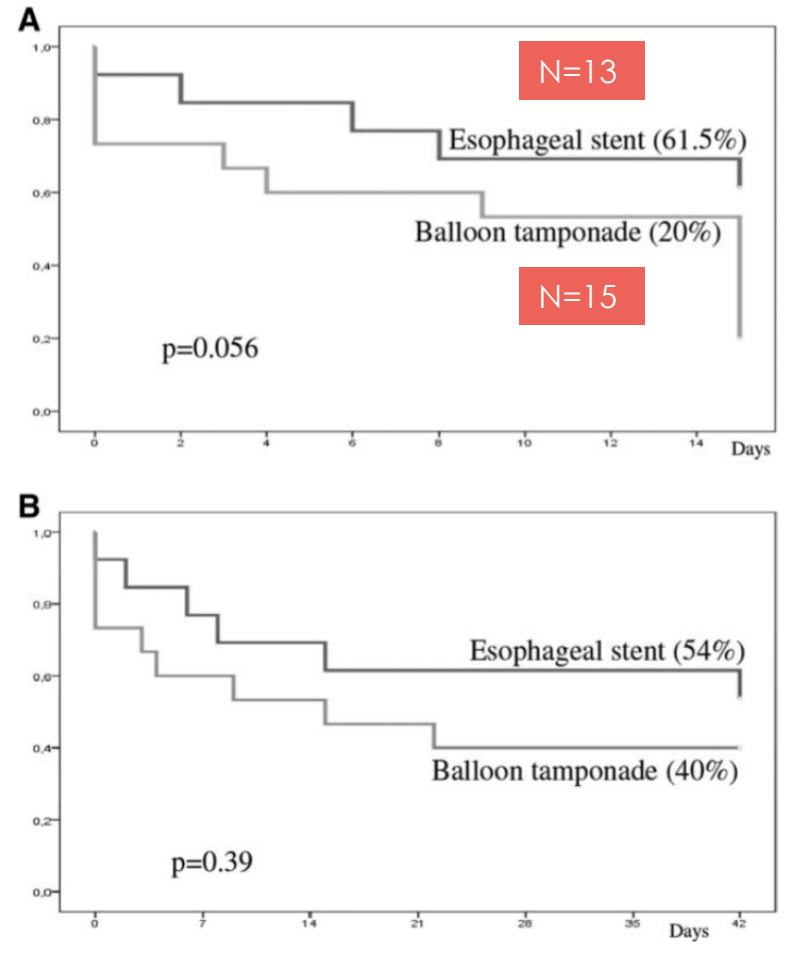


TABLE 3. AEs

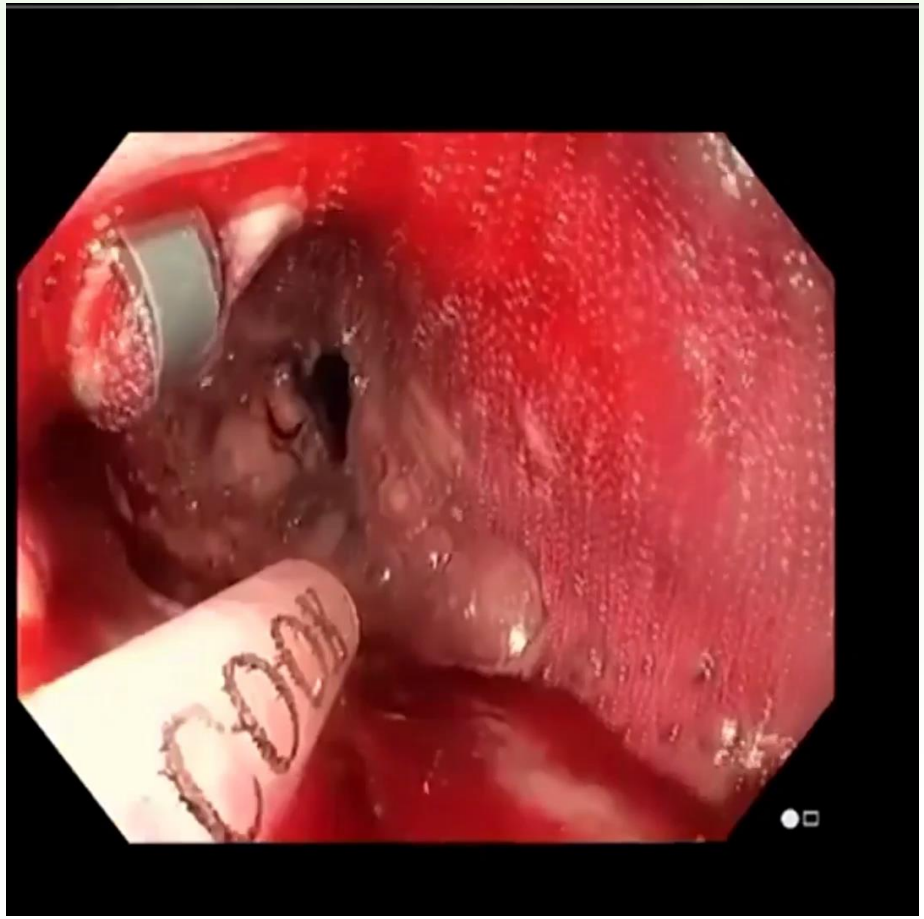
Variable	Esophageal Stent (n = 13)	Balloon Tamponade (n = 15)	*P* Value
Total number of AEs, n	6	14	
SAEs, n			
Cardiorespiratory arrest	1	1	
Aspiration pneumonia	0	5	
Esophageal rupture	0	1	
SBP and hepatorenal syndrome	1	0	
Mild AEs, n			
Infections	2	1	
Esophageal ulcer (not bleeding)	1	1	
Bronchoaspiration not causing pneumonia	1	3	
Seizures	0	1	
Transitory acute stroke	0	1	
Patients with at least one AE, n (%)	4 (31)	11 (73)	0.024
Patients with at least one SAE, n (%)	2 (15)	7 (47)	0.077
Patients with at least one device-related SAE, n (%)	1 (8)	6 (40)	0.049

SEMS with less SAE compared to Balloon Tamponade

Escorsell et al. Hepatology 2016

Hemospray for Rescue

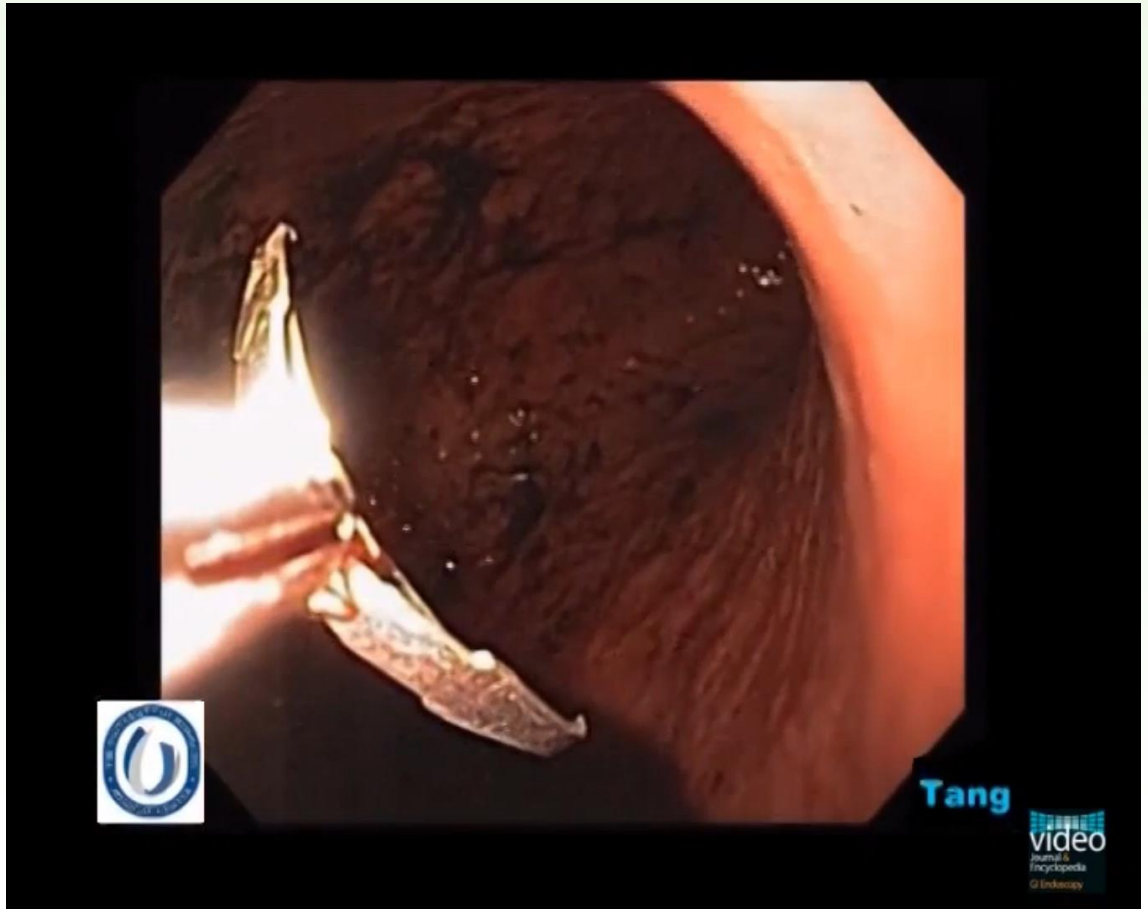
- Hemostatic powder that can provide immediate hemostasis
  - Off-label use for variceal bleeding
- Temporizing measure, but can provide hemostasis as **bridge** to other therapies
  - Ensure ALL surfaces covered
- Higher re-bleeding rates for actively bleeding varix
- Take care to prevent clogging in channel



Adapted from Dr. Fateh Bazerbachi

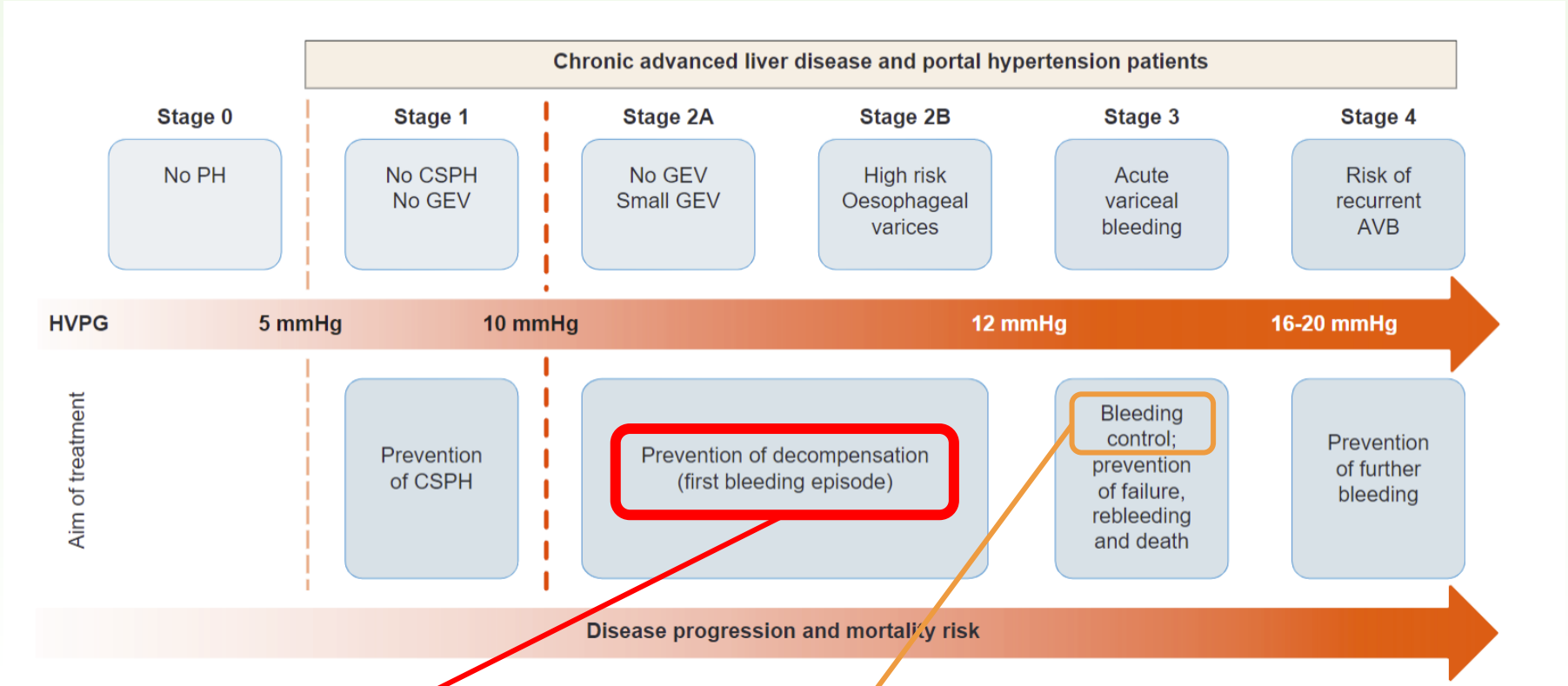
Endoclips

- Banding remains superior to endoclips
  - Multiple trials including RCTs
- But, may have role in refractory bleed or post-banding ulcers



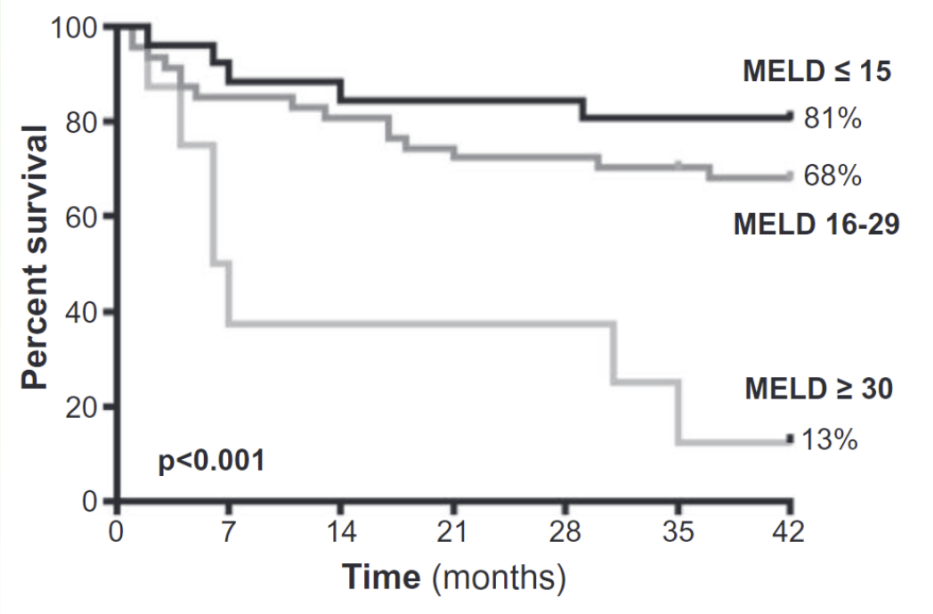
Tang VideoGIE June 2013

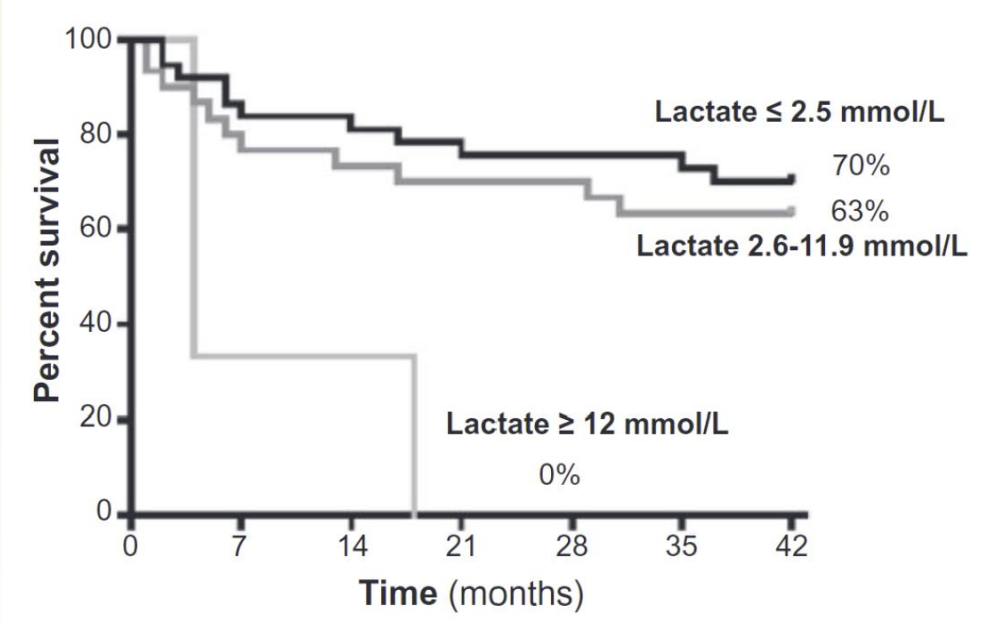
Rescue TIPS



Magaz et al, J Hep 2020

Rescue TIPS: Who Can't Get a TIPS?





Lactate ≤ 2.5 mmol/L + MELD ≤ 15 → 6-week OS 100% in derivation, 86% in

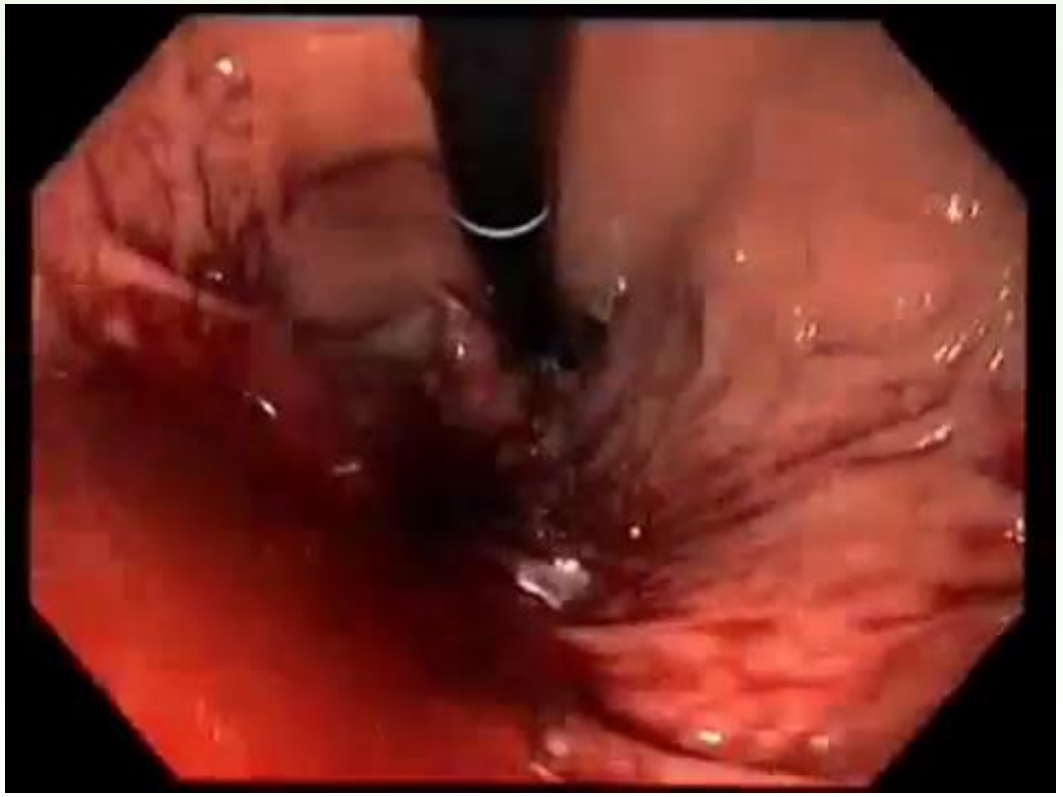
Lactate ≥ 12 mmol/L + MELD ≥ 30 → 6-week OS 5% in derivation, 10% in

Walter et al Hepatology 2021

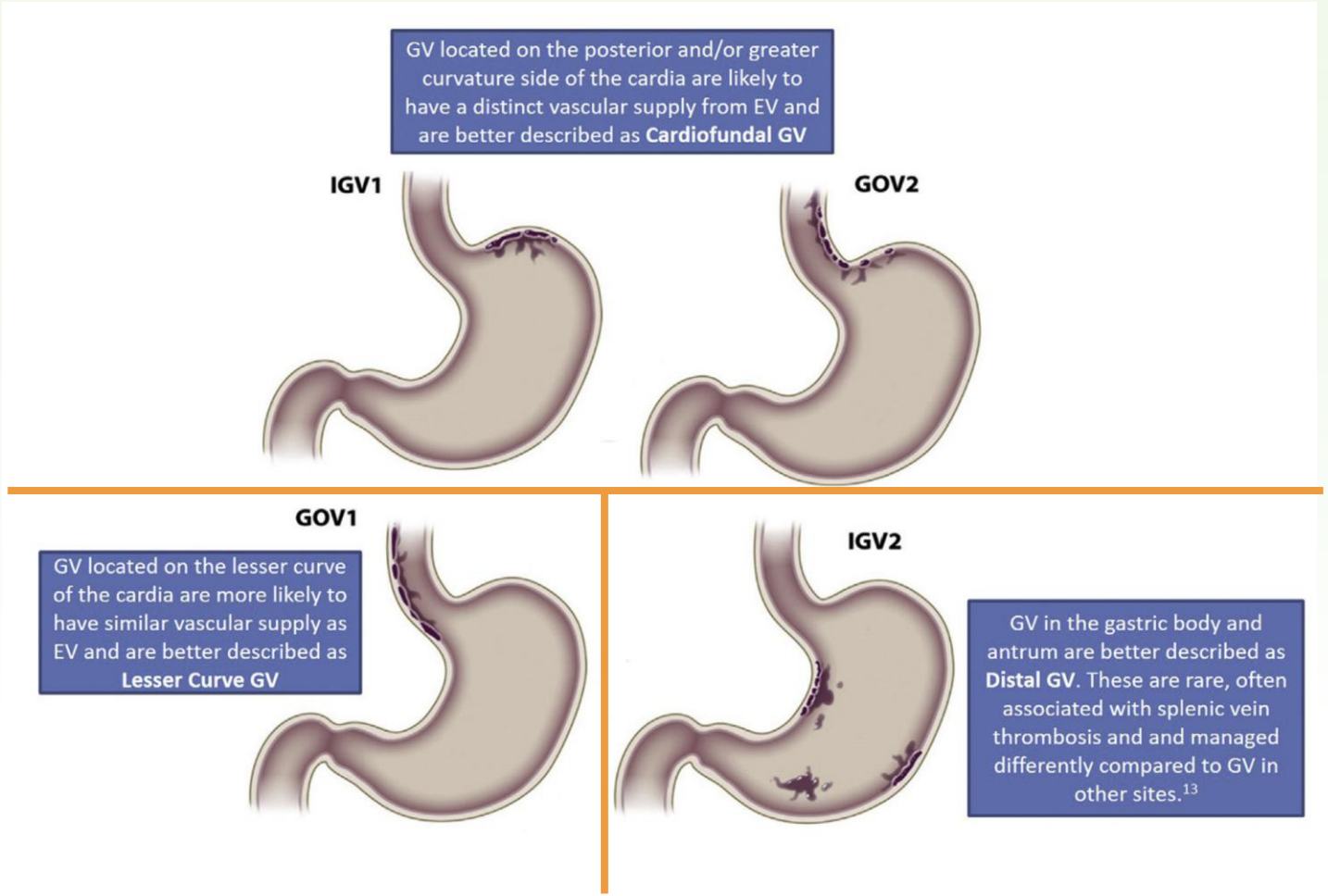
Billy Rubin Returns

- Does well with sclerotherapy and has subsequent banding sessions on residual varices
- Presents 4 months later with recurrent hematemesis and hemorrhagic shock
- EGD performed emergently at bedside

We're going to need a bigger band…

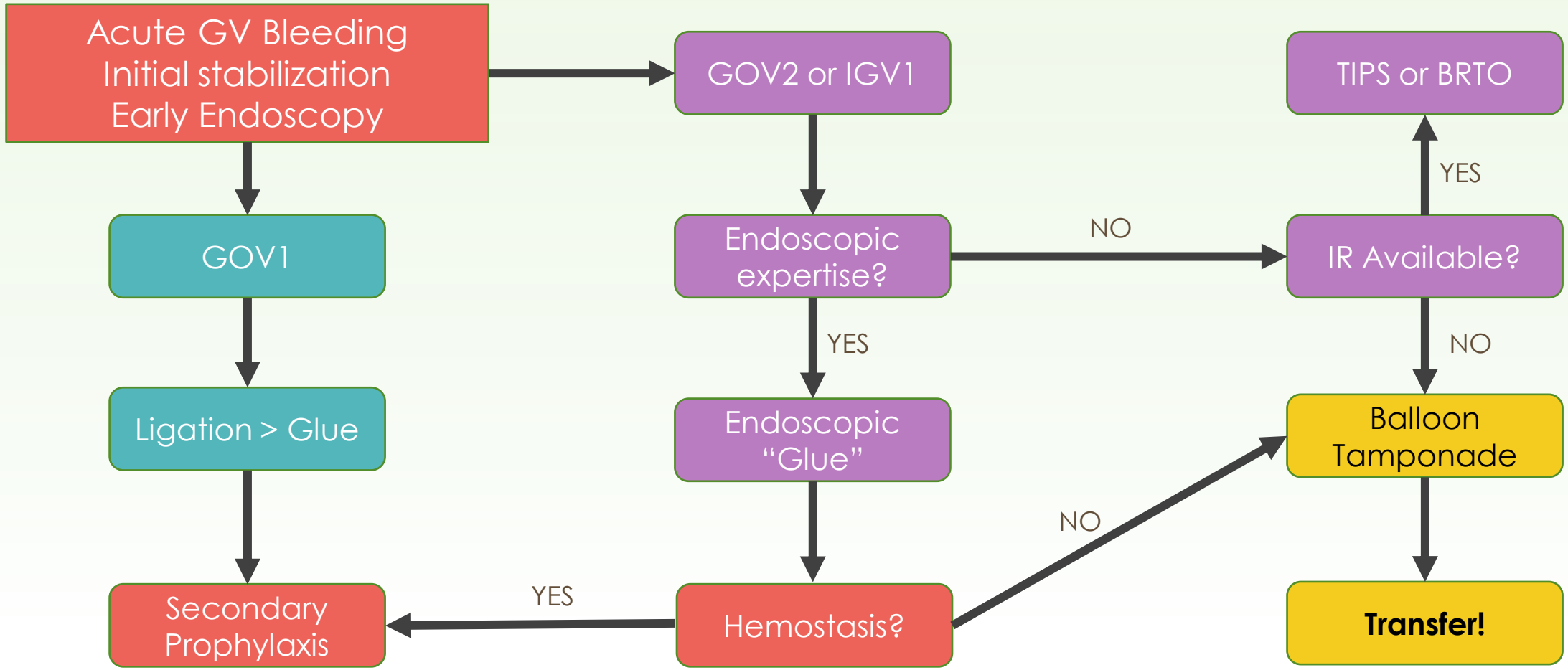


Sarin Classification for Gastric Varices



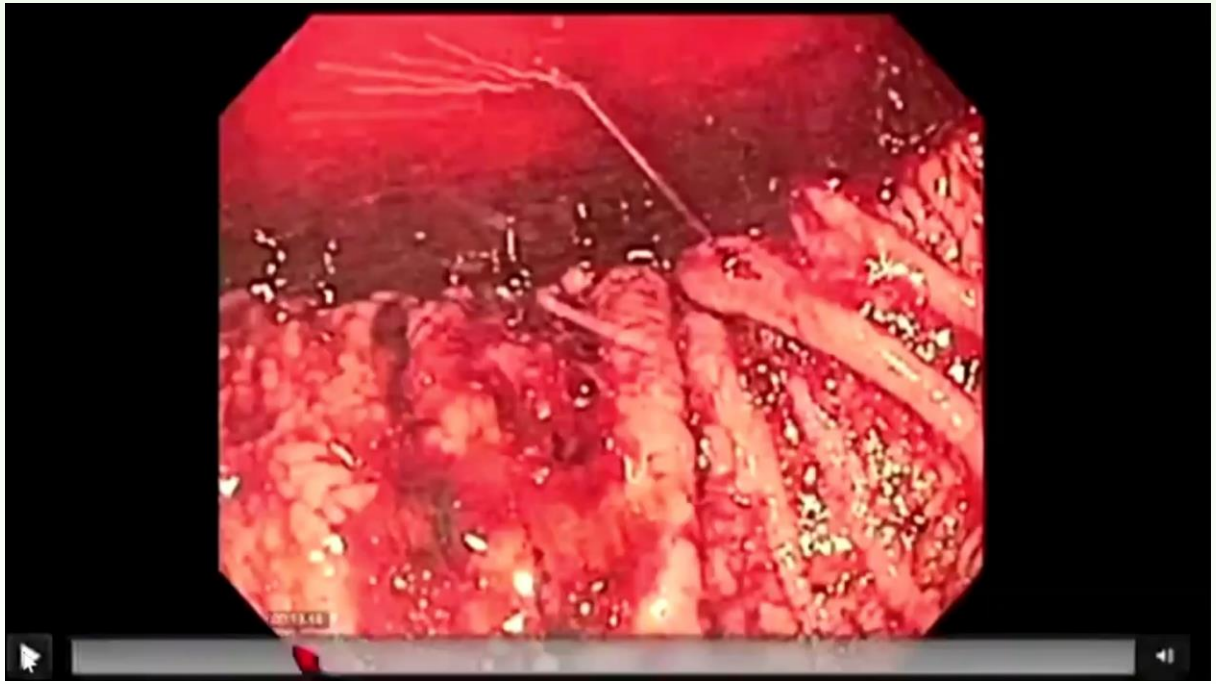
Henry et al, CGH 2021

Gastric Variceal Bleeding Algorithm



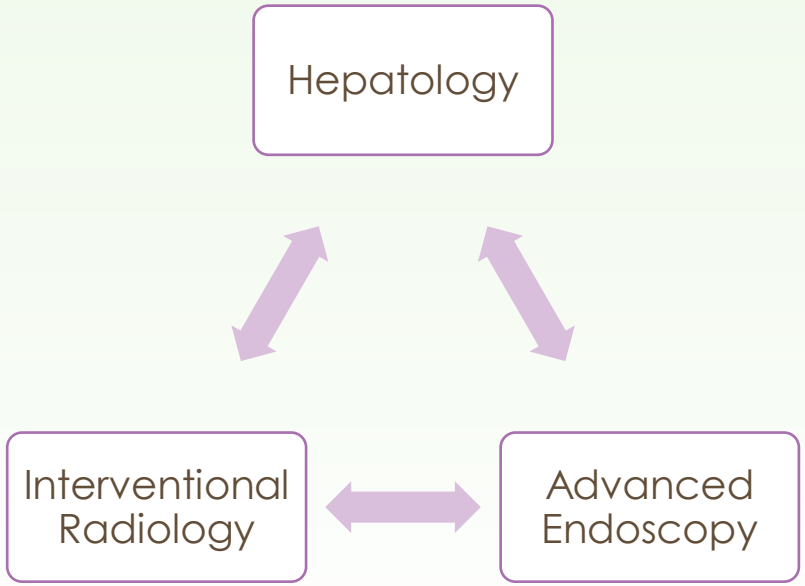
Management of GOV1

- Treat the same as esophageal varices
- Ligation has 90-100% initial hemostasis rate
  - Only 5-10% re-bleed rate
- Endoscopic glue also highly effective



Adapted from Dr. Fateh Bazerbachi

Management of Cardiofundal Varices



Endoscopic Treatment

- Direct Glue/Thrombin
- EUS-Guided Glue/Thrombin
- EUS-Guided Coil +/- Glue

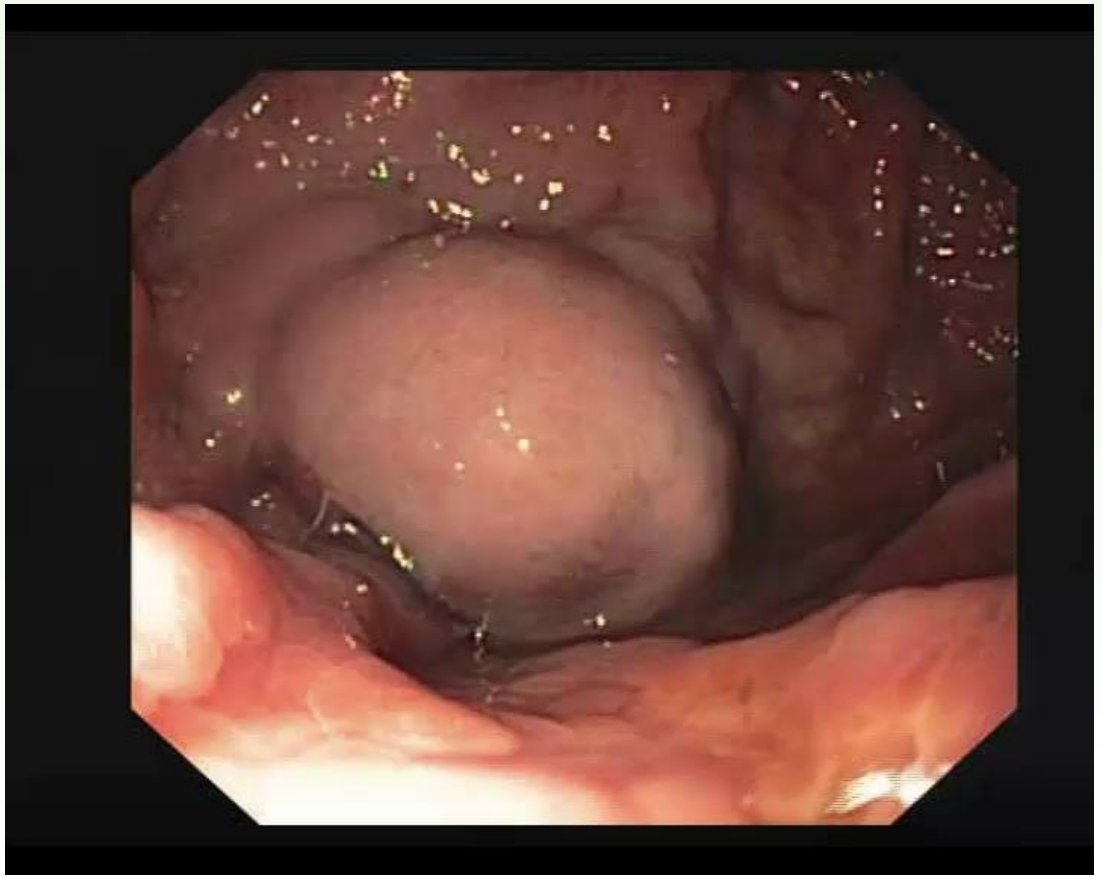
IR Options: +Shunt

- BRTO, CARTO, PARTO

IR Options: No Shunt

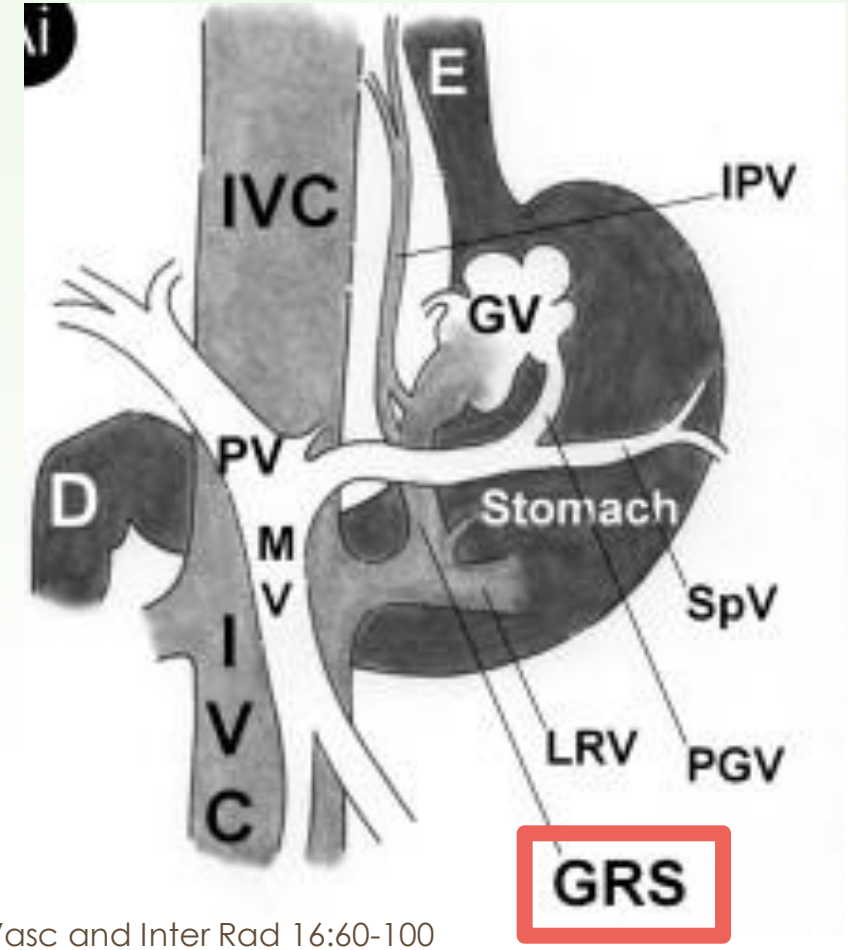
- TIPS
- Antegrade Obliteration (+/- TIPS)

Example: EUS-Guided Coil + Glue



Gastrointest Endosc. 2013 Nov;78(5):711-21

IR Interventions

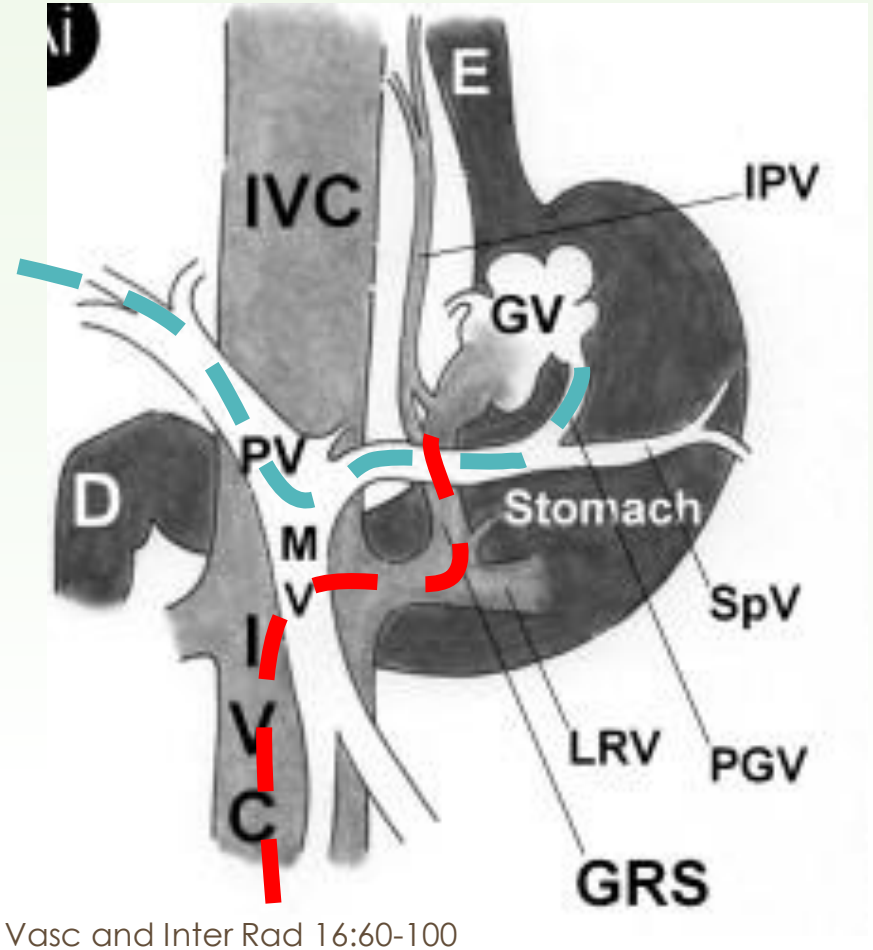


Saad, W et al. Tech Vasc and Inter Rad 16:60-100

GRS = Gastrorenal shunt

- Major route for glue embolization
- Present in > 85% of patients with cardiofundal varices
- Can be assessed through contrasted CT or MRI
- Access shunt to perform obliteration

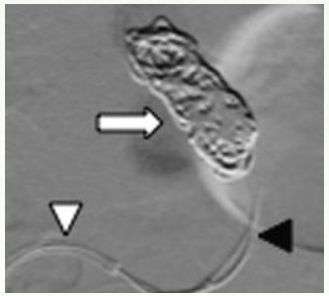
IR Interventions



Saad, W et al. Tech Vasc and Inter Rad 16:60-100

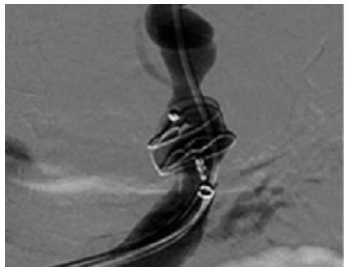
BRTO – Balloon Retrograde Transvenous Obliteration

BATO – Balloon Antegrade Transvenous Obliteration



CARTO – Coil Assisted Retrograde Transvenous Obliteration

CATO – Coil-Assisted Antegrade Transvenous Obliteration



PARTO – Plug Assisted Retrograde Transvenous Obliteration

PATO – Plug-Assisted Antegrade Transvenous Obliteration

High-Yield Pearls for Post-GV Bleeds

- Endoscopic or IR Obliteration
  - Secondary prophylaxis with NSBB should be started
    - Carvedilol preferred
  - Repeat EGD in 4 weeks to ensure smaller GV size
    - Also evaluate for worsening esophageal varices
  - Watch for worsening ascites
  - Pulmonary embolism can occur
    - Radiographic embolism up to 47% in case series; but only 1 symptomatic
- TIPS
  - Consider lactulose or rifaximin for hepatic encephalopathy prophylaxis

Case Presentation: Epilogue

- Balloon tamponade placed to stop acute bleeding
- Underwent TIPS placement given history of variceal hemorrhage
- No further bleeding, currently doing well while maintaining sobriety

Take-Home Points

- Don't give routine blood products to correct coagulopathy in cirrhosis
- Expand your toolbelt if possible
  - Sclerotherapy, Hemospray and Endoclips can all be useful
  - SEMS > Balloon tamponade for refractory bleeding
- Gastric Variceal Bleeding requires multi-disciplinary treatment
  - Cardiofundal → Treatment may be guided by presence of GRS
- Don't forget about secondary prophylaxis!
  - Carvedilol has best data

CME/MOC Question

A 48 year old F with primary biliary cholangitis and cirrhosis undergoes EGD for evaluation of hematemesis. EGD reveals actively spurting varix just inferior to the GE junction along the lesser curvature. What is the recommended intervention to achieve hemostasis?

A. Cyanoacrylate (i.e. glue) injection

B. EUS-Guided Coil placement

C. Endoscopic Ligation

D. Balloon Retrograde Transvenous Obliteration (BRTO)

E. Transjugular Intrahepatic Portosystemic Shunt (TIPS)

CME/MOC Answer

- C. Endoscopic Ligation
- Endoscopic ligation can successfully achieve hemostasis in 90-100% of patients that have bleeding GOV1 along the lesser curve of the stomach