

Hemostasis Beyond TIPS

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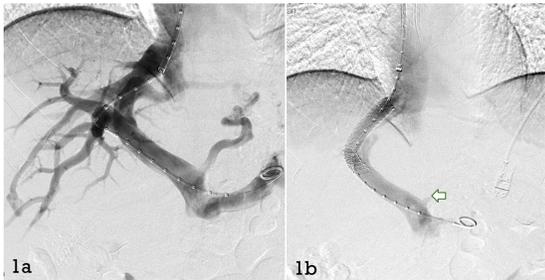
Background

- Varices like esophageal, gastric and ectopic i.e. dilated portosystemic collaterals outside the GE region develop once the portosystemic gradient exceeds a certain threshold to decompress the portal circulation.
- Unfortunately these varices can bleed and hemostasis with decompression therapies alone like TIPS/DIPS/Mesocaval shunt for varices other than esophageal demonstrate higher rebleed rates.
- This exhibit categorizes portal hypertension interventions based on right (hepatopetal) and left (hepatofugal) sided portal hypertension and explores endovascular alternatives despite the presence of decompression therapies for effective control of bleeding gastric and ectopic varices.

Pathophysiology

- Commonest site of bleeding varices:
 - Esophageal: up to 70%
 - Gastric: 20%- 30%
 - Ectopic: 1%-4%
- Threshold portosystemic gradients for spontaneous variceal bleeding:
 - Esophageal >12mmHg
 - Gastric < 8mmHg (tend to bleed even at lower gradients)
- Hemostasis rates with decompression therapy alone:
 - Esophageal varices >90%
 - Farther away from liver- hepatofugal
 - Gastric: 90%
 - Ectopic: 17%-37%

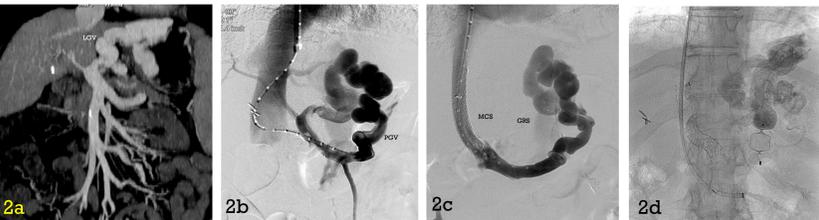
Esophageal Varices (EV)



-Major cause of death (risk of 1st bleed-12%/yr).
 -Esophageal (70%)> Gastric (30%)
 -Mortality: 15%-20% within 6 weeks of bleed
 -Rebleed rates refractory to endoscopy: 25%-33% over 18 months.
 -Rebleed rates with TIPS: 6% - 27%

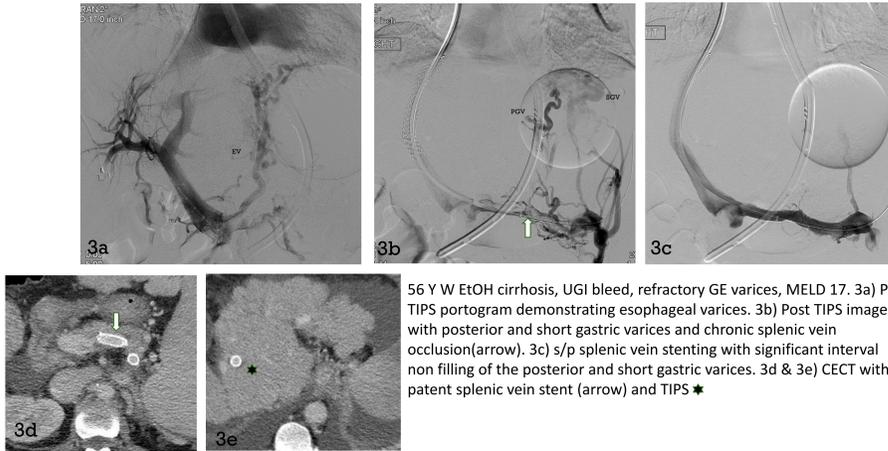
Pre (1a) and post (1b) TIPS portogram in a 56-year-old male with esophageal variceal bleeding refractory to endoscopic management, MELD 14. PSG reduction from 15mmHg to 7mmHg post TIPS. No filling of left coronary vein post TIPS (arrow).

Gastric Varices (GV)



59 Y/F with NASH cirrhosis with bleeding gastric varices. 2a) MIP Coronal CT image shows diminutive portal vein and large gastric varices being supplied by left gastric vein(LGV). 2b) Portogram during percutaneous mesocaval shunt creation through the IVC showing decompression of the portal circulation through the large LGV and posterior gastric vein (PGV) into the gastro-renal shunt (GRS) (2c). PSG drop from 8mmHg to 2mmHg post Meso Caval Shunt creation (MCS). 2d) PARTO was performed as a staged procedure and the patient continued to slowly ooze until the obliteration was performed. 2e) CT images show the Amplatz plug (arrow) and MCS

- Gastric varices (prevalence 20%)
- Less common but high mortality (45%-55%)
 - Endoscopic management less effective as compared to EV
 - GV rebleed rates with embolization 0%-10%
 - Exacerbation of portal hypertension (EV:30%-68%, Bleeding EV: 17%-24%, Ascites: 0-44%)



56 Y W EtOH cirrhosis, UGI bleed, refractory GE varices, MELD 17. 3a) Pre TIPS portogram demonstrating esophageal varices. 3b) Post TIPS images with posterior and short gastric varices and chronic splenic vein occlusion(arrow). 3c) s/p splenic vein stenting with significant interval non filling of the posterior and short gastric varices. 3d & 3e) CECT with patent splenic vein stent (arrow) and TIPS *

Ectopic Varices

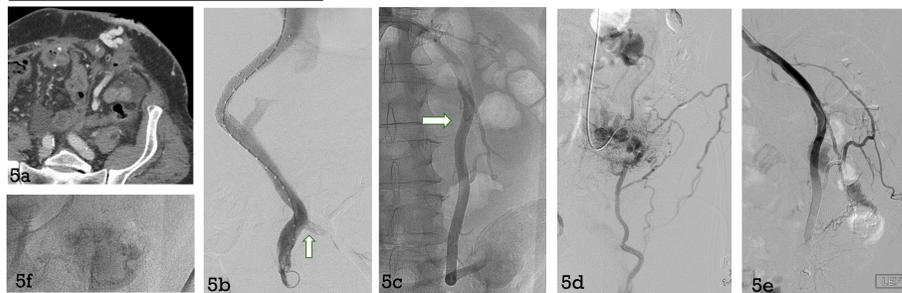
COLONIC VARICES



- Mortality up to 40%; 3%-4% per bleeding episode
- Sites: Duodenum, Jejunum, Colon, Rectum, Biliary tract, umbilical, parastomal
- Rebleed rates: 42% with TIPS alone vs 28% for combination with embolization

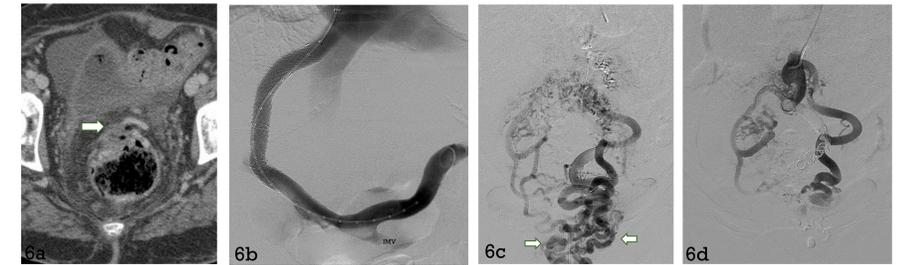
42 Y/M with alcoholic cirrhosis, MELD 28, BRBPR. CTA (4a) & MIP (4b, 4c) shows right colonic bleed (arrow) from a colonic varix (CV). 4d) TIPS with PSG reduction from 16mmHg to 4mmHg. Continued to have BRBPR requiring transfusions. Trans-TIPS Superior mesenteric venogram (4e, 4f) demonstrates hepatofugal flow in the SMV with opacification of the colonic varix decompressing into a retroperitoneal collateral (RC) into the IVC. The colonic varix was embolized using sodium tetradecyl sulphate, lipiodol and air and embolization coils with final resolution of the bleed.

PARASTOMAL VARICES



67 Y/M, H/O colon cancer with LLQ colostomy with cirrhosis & bleeding parastomal varix (5a) requiring transfusions. DSA and fluoroscopic images during creation of TIPS and simultaneous parastomal varix sclerotherapy. Trans TIPS portogram (5b & 5c) shows reflux of contrast into the proximal IMV (arrow) with hepatofugal flow into the IMV decompressing through abdominal wall venous system(5d). (5e)The varix was embolized using foam sclerosant while occluding the outflow left inferior epigastric vein with direct US compression. (5f) Sclerosant staining in the parastomal varix.

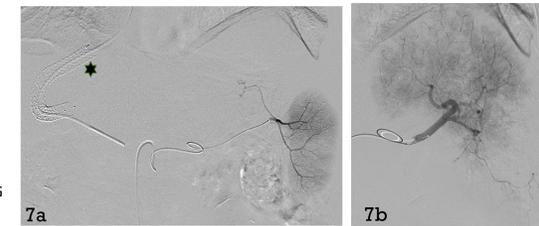
RECTAL VARICES



67 Y/F, NASH cirrhosis with acute rectal bleeding. 6a) CT image showing anterior rectal varices (arrow). 6b) Post TIPS image showing reflux of contrast into the proximal IMV. PSG reduction from 25mmHg to 4mmHg post TIPS. 6c) Post TIPS IM venogram shows retrograde flow through the superior rectal varices (arrow). 6d) Post embolization images using foam sclerosant and coils.

Partial Splenic Artery Embolization

No significantly reduced variceal re-bleeding in TIPS vs TIPS combined with PSE.

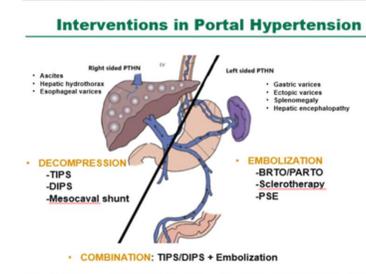


66 Y/W with cirrhosis S/P TIPS (★). (7a, 7b)Underwent PSE with decrease in the PSG from 4mmHg to 2mmHg.

Combination Therapies

- UGIB @1 yr for BRTO only, TIPS only & BRTO+TIPS =11, 9 & 0% resp
- Ascites/hydrothorax rates: 57% @1 yr for BRTO vs 0% @1 yr for BRTO+TIPS
- Improved short-term TIPS patency

Conclusion



- Decompression procedures provide effective control of refractory esophageal variceal bleeding.
- Gastric and ectopic varices (varices farther away from the liver-hepatofugal) demonstrate superior control with obliteration techniques.
- Obliteration techniques however exacerbate portal hypertension.
- Combination techniques (combining decompression with embolization), if appropriate, should be considered for hepatopedal varices.

References

1. Lipnik AJ, Pandhi MB, Khabbaz RC, Gaba RC. Endovascular Treatment for Variceal Hemorrhage: TIPS, BRTO, and Combined Approaches. *Semin Intervent Radiol.* 2018;35(3):169-184. doi:10.1055/s-0038-1660795
2. Romano J, Welden CV, Orr J, McGuire B, Shoreibah M. Case Series Regarding Parastomal Variceal Bleeding: Presentation and Management. *Ann Hepatol.* 2019;18(1):250-257. doi:10.5604/01.3001.0012.7934.
3. Wan Yue-Mang et al: Simultaneous Combined Transjugular Intrahepatic Portosystemic Shunt and Partial Splenic Embolization for Decompensated Cirrhosis. *Journal of gastroenterology and hepatology research,* 2016, Vol 5, No1.