CAIR RESIDENT AND FELLOW DAY

TIPS FOR TIPS REDUCTION

Institution hidden

ACKNOWLEDGEMENTS

- Thank you Dr. (removed for anonymity as requested) for providing this case and for the teaching around this case.

OVERVIEW

- TIPS (why, when, how)
- TIPS Reduction (Why)
- Case Report
- Other options

TIPS

- Established intervention for tx of complications of cirrhosis. {Miraglia, 2017}
  - Variceal bleeding
  - Refractory ascites
- Hepatic to portal vein shunt to decrease the portosystemic pressure gradient.
- RCT's –
  - lower variceal rebleeding with TIPS
  - Ascites recurrence lower with TIPS
    - However survival benefit data discordant
    - Shunt dysfunction and hepatic encephalopathy

TIPS INDICATIONS

- Rescue variceal hemorrhage
- Recurrent variceal hemorrhage despite endoscopic therapy
- Portal hypertensive gastropathy
- Refractory ascites
- Hepatic hydrothorax
- Budd-Chiari syndrome

HEPATIC ENCEPHALOPATHY

- New or progressive HE in 22-50% of patients post TIPS {Taylor, 2016}.

- Thought to relate to nitrogenous compounds (ammonia) .
  - Overproduction of enteric neurotoxins by intestinal flora.
  - Splanchnic blood return to systemic circulation without hepatic filtration.
  - Fluctuations in concentration and consciousness.

- Majority controlled by medication (lactulose)

OPTIONS

- TIPS occlusion
- TIPS reduction with bare metal stent
- TIPS reduction with covered stent

TIPS REDUCTION

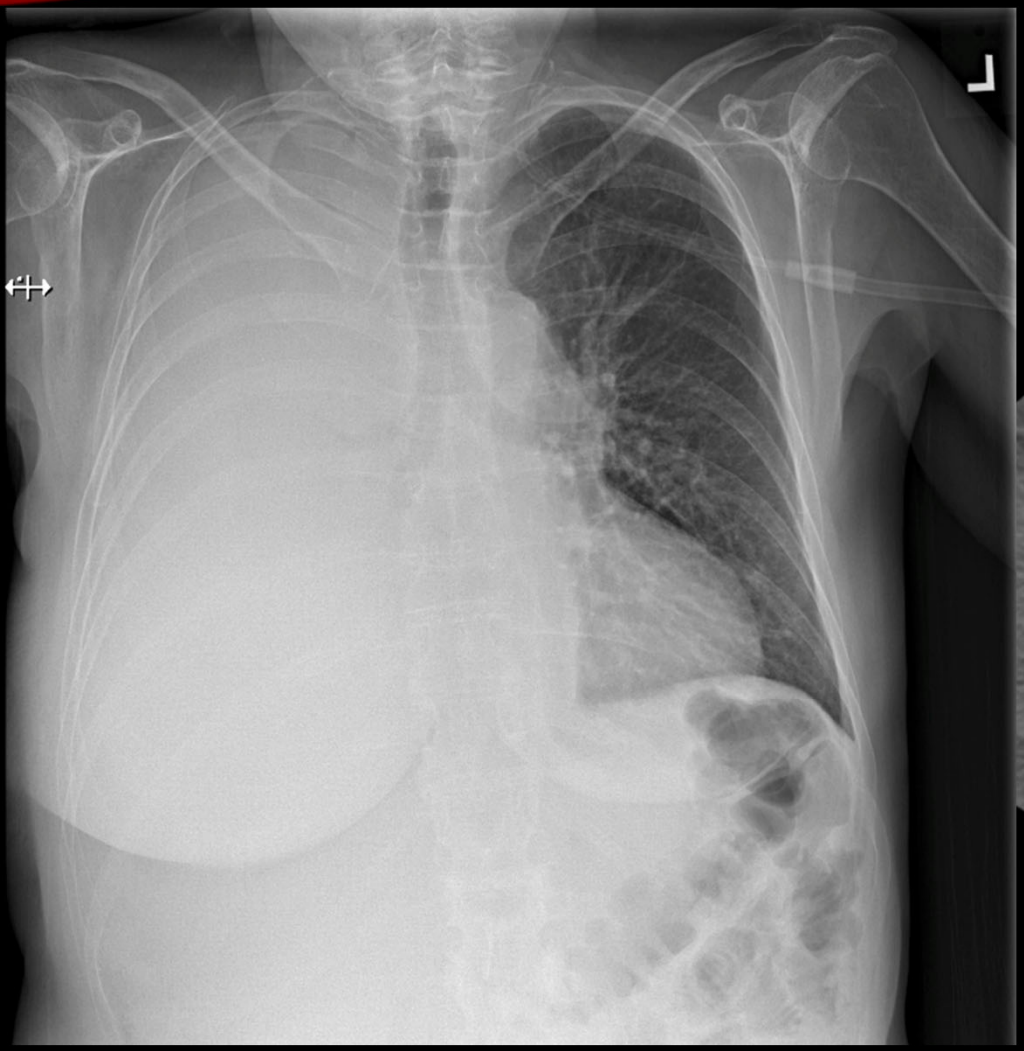
- 3-7% of patients experience refractory HE because of excessive shunting {Sarwar, 2021}

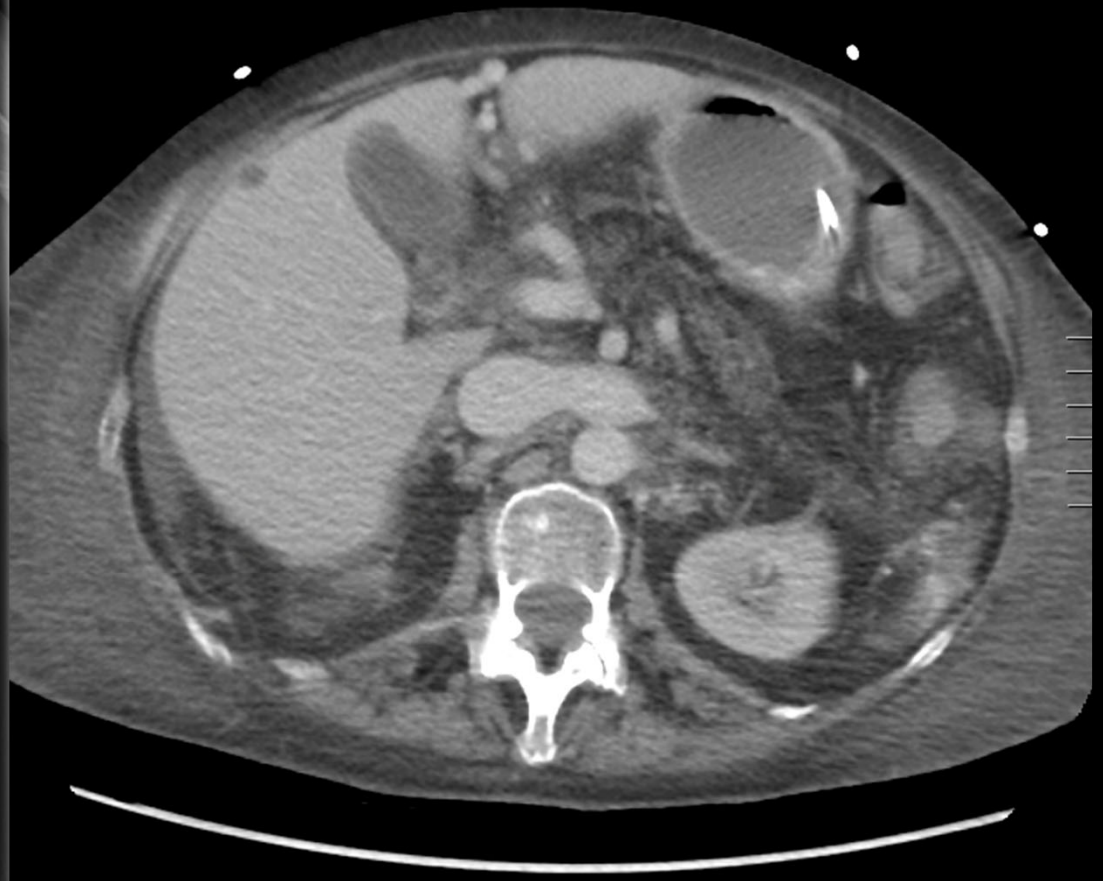
- Endovascular techniques to narrow existing tips lumen
  - To decrease through volume and increase portosystemic pressure gradient.

- Increased risk of complications of portal hypertension.

CASE

- 54y Female ETOH Cirrhosis
  - Child Pugh B – Dx 2019 (post GI bleed for gastric/duodenal ulcers in setting of H.pylori)
  - Recurrent hepatic hydrothorax in setting of hypoxic respiratory failure/pneumonia
  - Required TIPS
    - 8-10mm Viatorr stent expanded to 8.5mm
    - Portosystemic gradient drop from 13 to 6mmHg





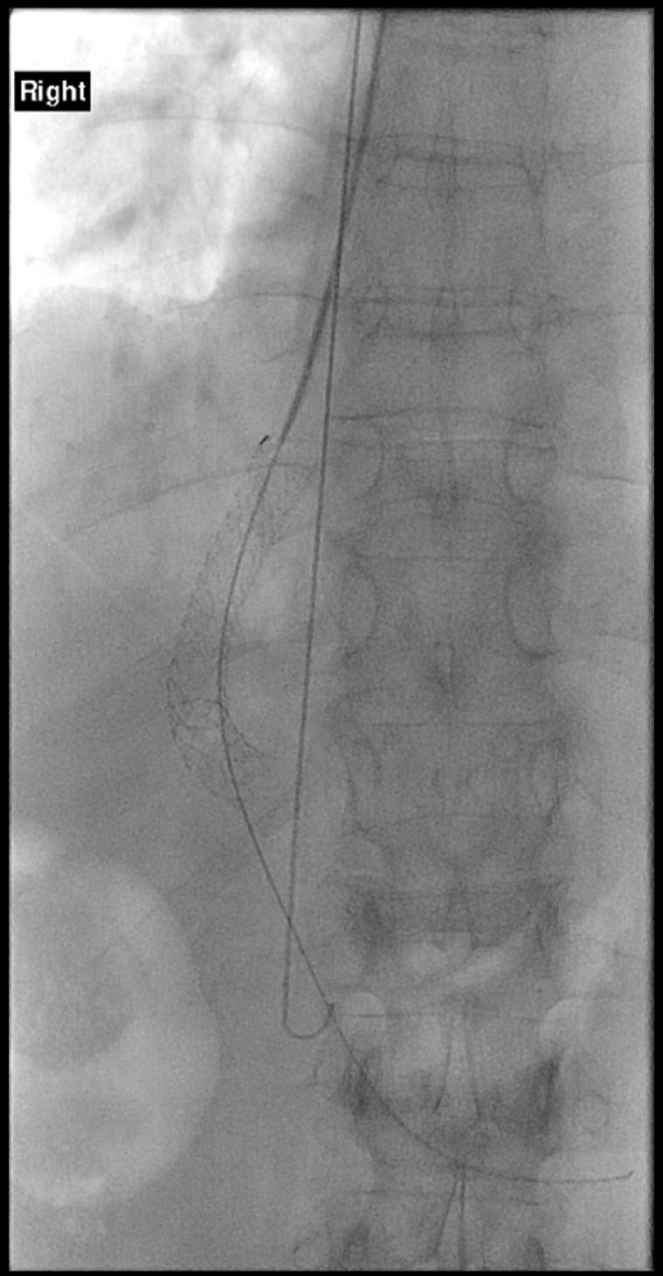
CASE CONT.

- Did well for two years
  - Sobriety → Child Pugh A
  - Fibroscan improved by 50%
  - However, difficulty with chronic episodes of HE poorly controlled with lactulose and rifaximin.
- IR consulted for TIPS reversal/closure
  - IR recommended reduction vs. reversal
    - Protection against esophageal varices with a target pressure of 10-11mmHg in the MPV.

Right IJV access x 2

8F and 6F sheaths

Kumpe and Glidewires via both sheaths



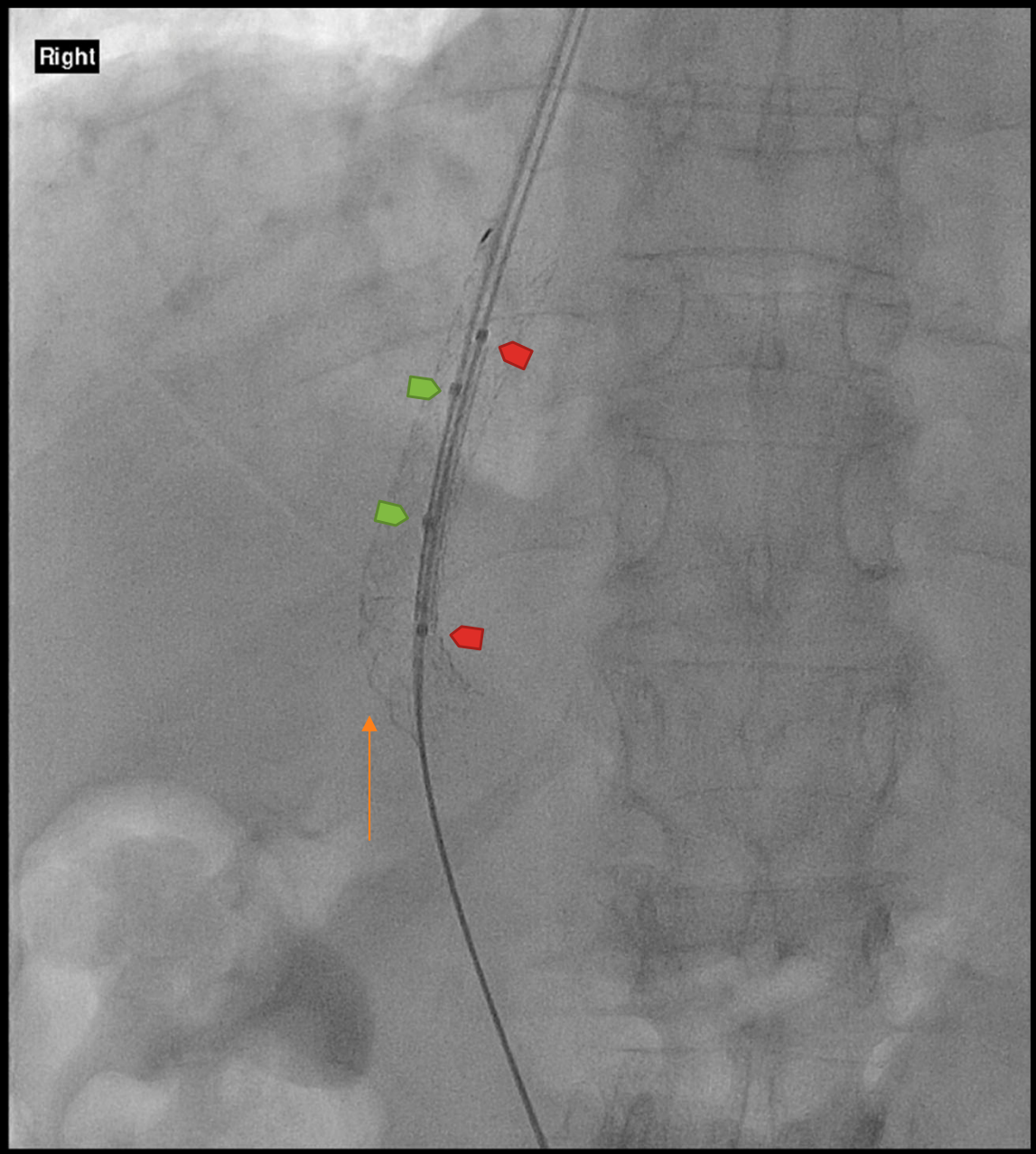
Straight flush catheter → portal venogram.

Portosystemic pressure gradient of 3-4mmHg.

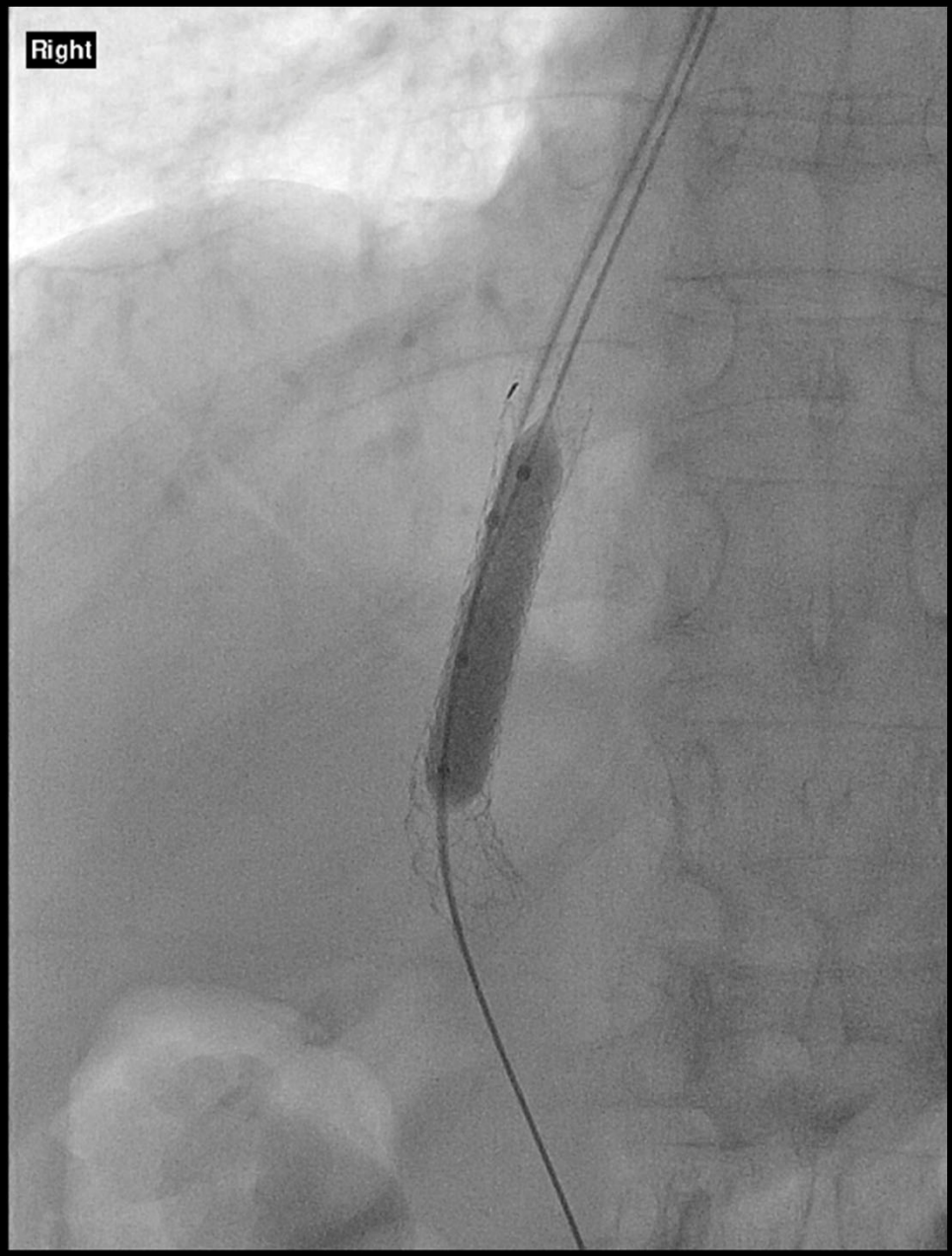
Deskeletonized portal venogram with high flow through TIPS

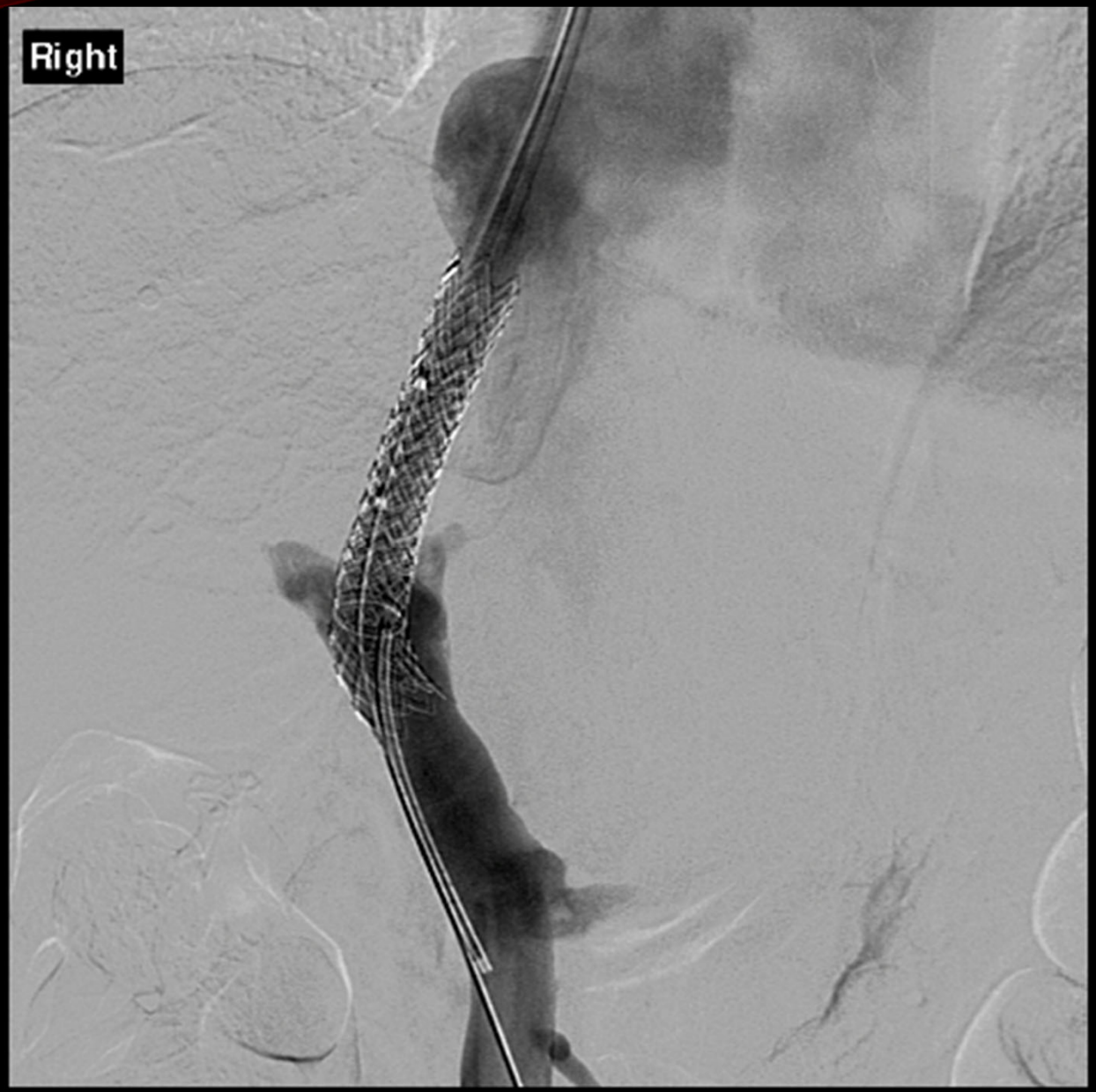
8 x 40mm Gore VBX balloon expandable stent through 8F sheath and positioned within the TIPS.

9 x 20mm balloon advanced over wire through the 6F sheath and parked in mid portion of TIPS stent (beside the sheathed VBX stent.



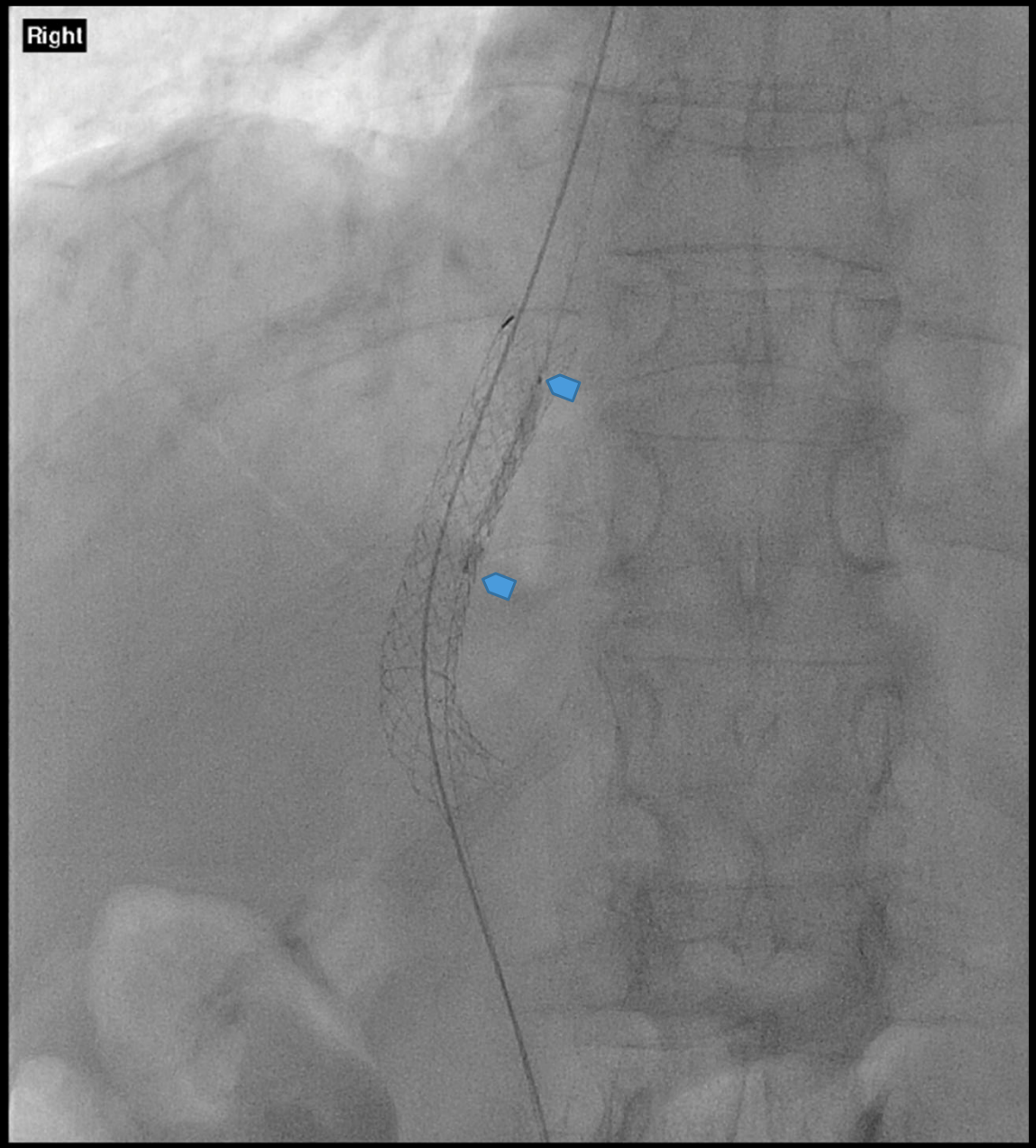
VBX deployed and angioplastied to 8.5mm → exchanged for V14 wire.




Right

A 9 x 20mm balloon inflated to narrow VBX stent.

A 2 x 40mm balloon over V14 wire to maintain small tract within the TIPS.



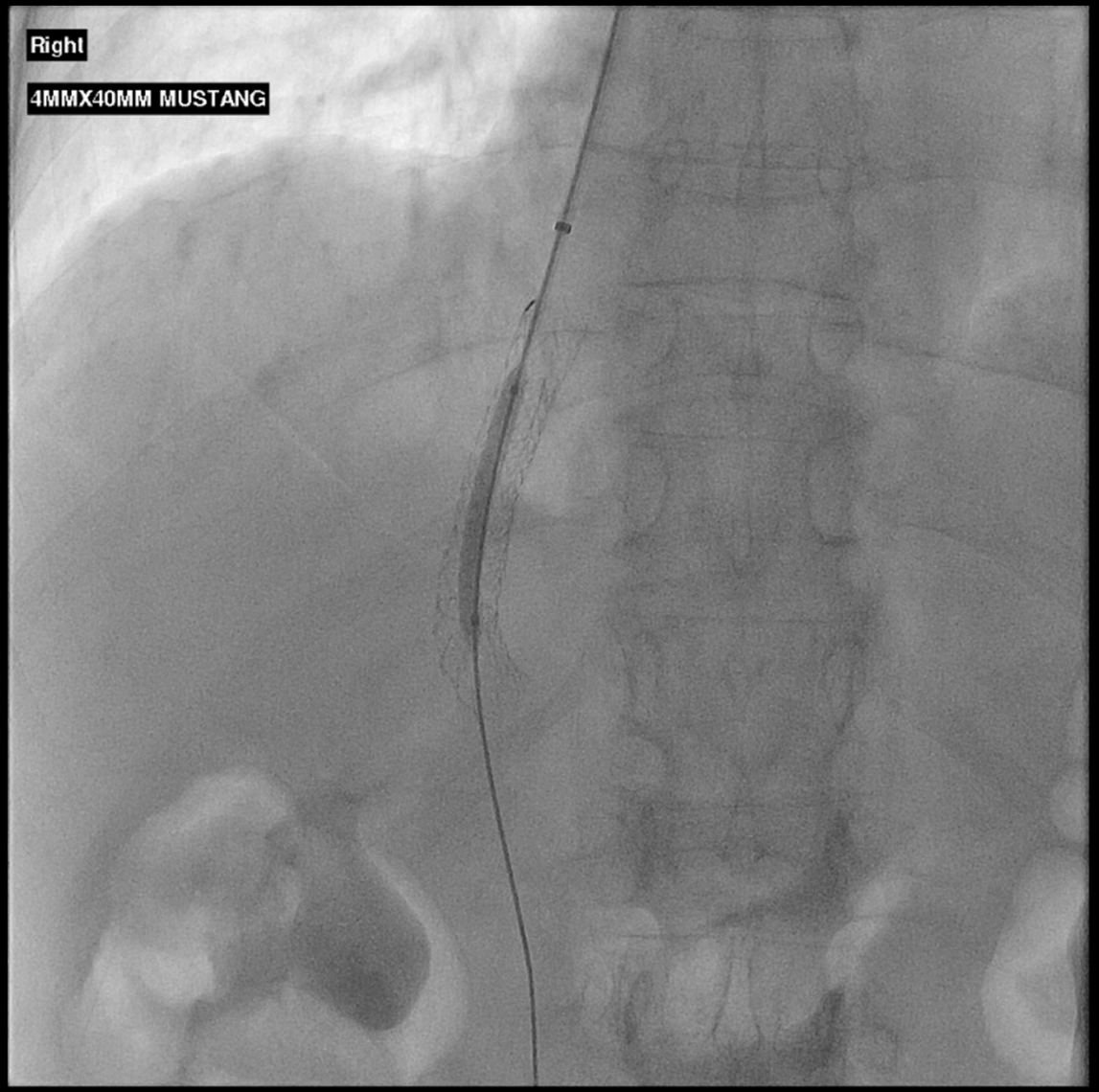
Repeat portal venogram however showed a portosystemic pressures of 16mmHg.

This would put patient at risk of variceal hemorrhage.

A 4 x 40mm balloon was advanced and angioplasty performed over V14

Sequentially expanded while checking portosystemic pressures.

Final angioplasty to 4.2mm.



Final portosystemic gradient measurement of 10-11mmHg.

Much higher flow in portal system compared to initial venogram

CASE FOLLOW-UP

- Short term follow-up
  - No episodes of hepatic encephalopathy, abdominal swelling, lower leg edema, or SOB

ALTERNATIVE TECHNIQUES

- TIPS OCCLUSION
  - Coils vs. occlusive balloon.

- Immediate increase in portal venous pressure
- Risk of recurrent variceal hemorrhage
  - Systemic complications (decreased cardiac output, hypotension and metabolic acidosis).
- Fatal case reports.

ALTERNATIVE TECHNIQUES

TIPS REDUCTION

- Constrained stents
    - Constrained Wallstent with 3-0 Silk to create hourglass-shape and luminal narrowing.
    - Alternative – balloon assisted stent to constrain a Wallstent.
- Downside of uncovered constrained stents is unpredictability of false lumen and inability to predict blood flow across the shunt.

ALTERNATIVE TECHNIQUES

Constrained or incompletely deployed stent-grafts

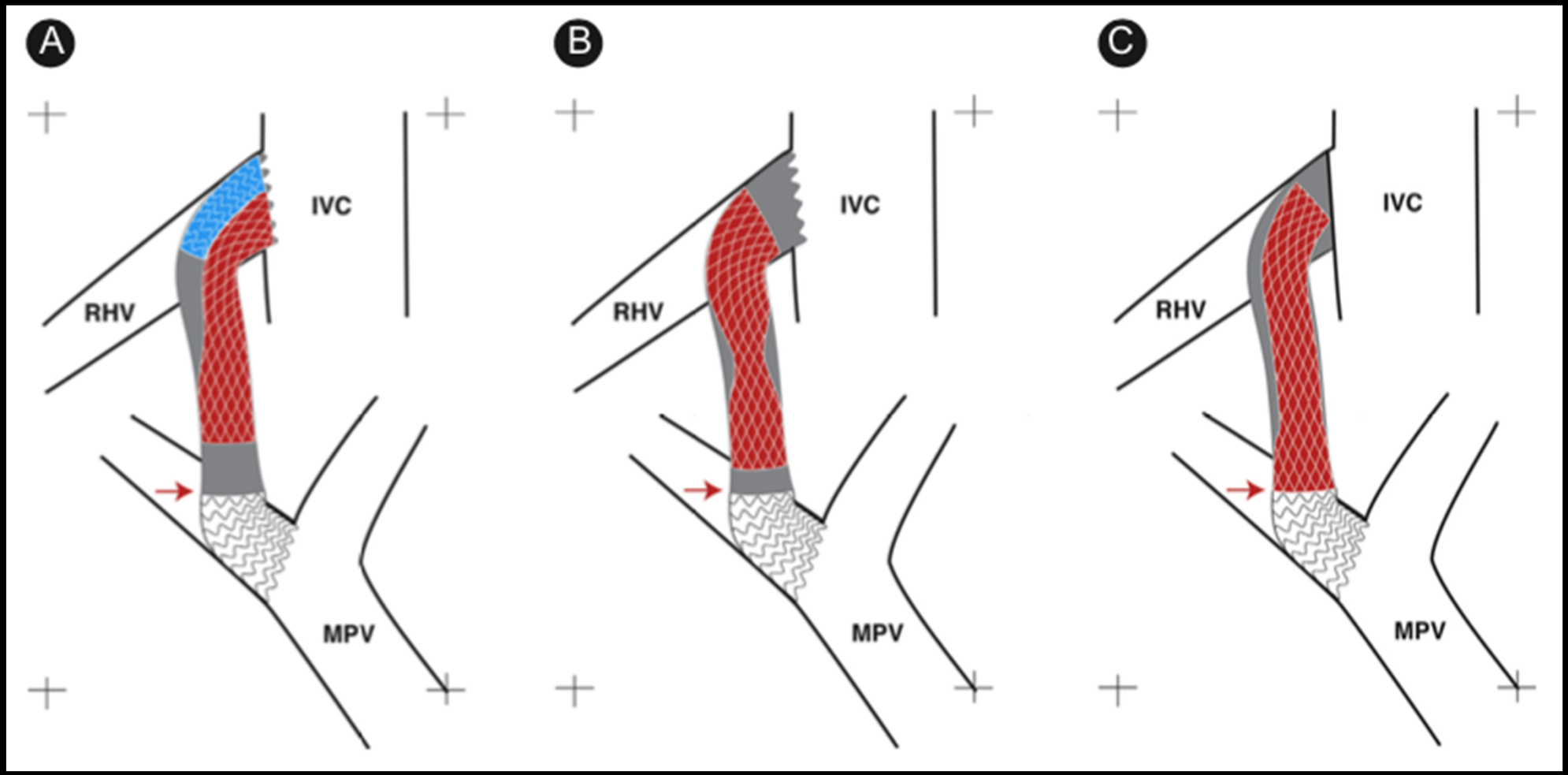
- Covered stent graft with waist facilitating turbulence and decreased flow/PSG.

Adjunct embolization

- Embolization of dead space around waist of reduction stent to ensure thrombosis.

Techniques for Transjugular Intrahepatic Portosystemic Shunt Reduction and Occlusion

Andrew G. Taylor, MD, PhD, Kanti P. Kolli, MD, and Robert K. Kerlan Jr., MD



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