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## Introduction

Spontaneous Portosystemic shunting (PSS) is a common complication of advanced cirrhosis and is usually a result of portal hypertension. In severe cases, it can lead to worsening hepatic encephalopathy (HE) resulting in multiple hospitalizations. We present a patient with a large PSS who failed initial embolization of the PSS, requiring subsequent Transjugular Intrahepatic Portosystemic Shunt (TIPS) placement as well as re-embolization.

## Clinical Case

A 55-year-old male with a history of non-alcoholic steatohepatitis (NASH) cirrhosis presented with altered mental status for 2 days and worsening abdominal distension for a week. On chart review, he had multiple admissions in the past 3-4 months for confusion secondary to hepatic encephalopathy.

### Past Medical History:

Heart failure  
 Coronary artery disease

### Medications:

Lactulose, rifaximin, furosemide, spironolactone  
 Caregiver reported compliance

### Family History:

No significant family history

### Social History:

No alcohol, smoking or recreational drug use. Living with sister who is also the caregiver

### Review of systems:

Positive for confusion, poor appetite  
 Negative for fever, cough, dysuria, vomiting, weakness, bleeding, weight loss

### Physical Exam:

Vital signs: BP 96/59 mm Hg, PR 94 bpm, RR 16, Temp 98.2F, O2 98% on room air  
 Orthostatic vital signs (-)

General: Confused, malnourished  
 HENT: Normocephalic, mucosa, no JVD

Cardiac: Elevated rate, normal rhythm. No added sounds  
 Pulmonary: Lungs clear to auscultation bilaterally

MSK: No edema or tenderness in any extremity  
 Abdomen: no organomegaly or shifting dullness

Skin: No hyperpigmentation, LE ulcers or wounds

Neuro: Asterixis (+)  
 Psychiatric: Unable to assess

## Hospital Course

### Initial workup

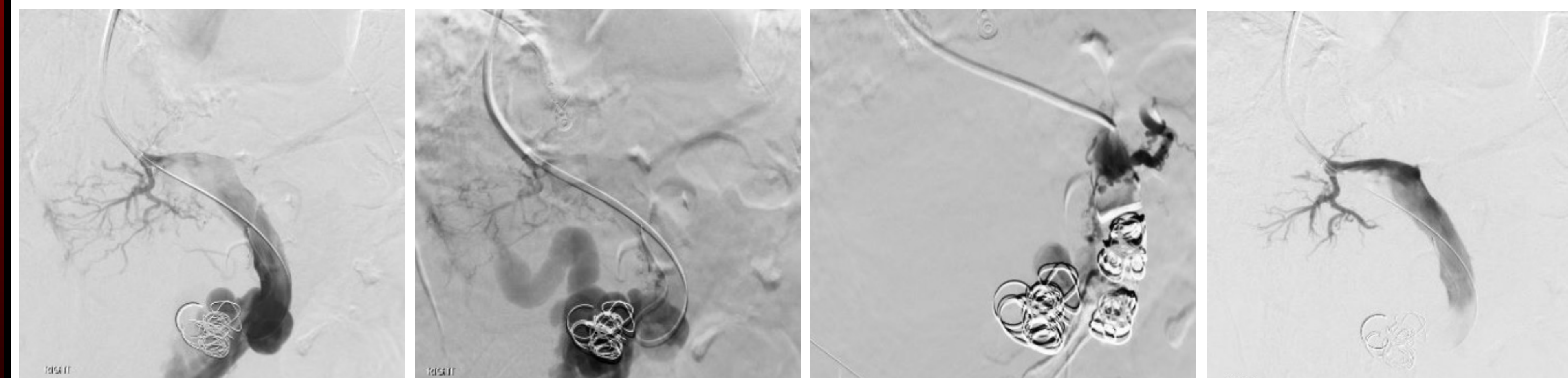
- Hemoglobin 7.4 g/dL; Leukocytes 4,600/uL; and Platelets 43,000/uL
- Na: 132, K: 3.6, Cl: 100, HCO3: 26, BUN: 20, Cr: 0.9
- Bilirubin 2.6, AST 119, ALT 90, Alk Phos 144, Albumin: 2.6 g/dL
- Lactic Acid 1.2, urinalysis/Blood cultures/Chest X ray/diagnostic paracentesis (-)
- CT Head: no acute intracranial abnormality
- 2D echo: LV ejection fraction 50%, grade 2 diastolic dysfunction

CT abdomen/pelvis with contrast: Cirrhosis, splenomegaly, moderate ascites, portal vein occlusion, and large portosystemic shunt from the splenic vein to the IVC measuring 2.2 cm in diameter. **Given recurrent encephalopathy episodes, compliance with lactulose/rifaximin, and no infectious causes, this large PSS was thought to be the cause of encephalopathy.**

Patient sent to interventional radiology, who embolized this shunt, however, the flow was not reduced. Subsequently, a TIPS procedure was planned in a month.

Venogram performed during the procedure showed extremely small main portal vein with flow reversal into the PSS. The main portal vein was then stented (TIPS). However, there was small flow through TIPS with still significant flow in the large PSS. The PSS was then embolized with several coils, and no further varix filling was observed.

No further admissions for hepatic encephalopathy in over six months.



Successful PSS embolization with no flow through it after TIPS placement

## Discussion

- Spontaneous PSS occurs as a result of worsening liver disease in cirrhotic patients, and clinical presentation can vary based on the location of the PSS
- In a study by Simón-Talero et al, ~50% of patients with large PSS had episodic and persistent HE
- Patients with HE are usually treated medically with lactulose, rifaximin, or zinc, and treatment of the trigger (infection, GI bleeding, substance use)
- In a study on 25 patients with large PSS undergoing embolization, Lynn et al demonstrated a 100% success rate in immediate post-procedure improvement. However, in our patient, there was continued flow despite embolization of the shunt.
- Hence, we performed a TIPS procedure with repeat embolization of the shunt which ultimately minimized blood flow through the large PSS and redirected flow into the portal vein
- This novel modality of treatment may be beneficial in portosystemic shunting which does not respond to embolization, and further studies may be needed to understand the benefit in such refractory cases

## References

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2. Laleman W, Simon-Talero M, Maleux G, et al. Embolization of large spontaneous portosystemic shunts for refractory hepatic encephalopathy: a multicenter survey on safety and efficacy. *Hepatology*. 2013;57(6):2448-2457
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