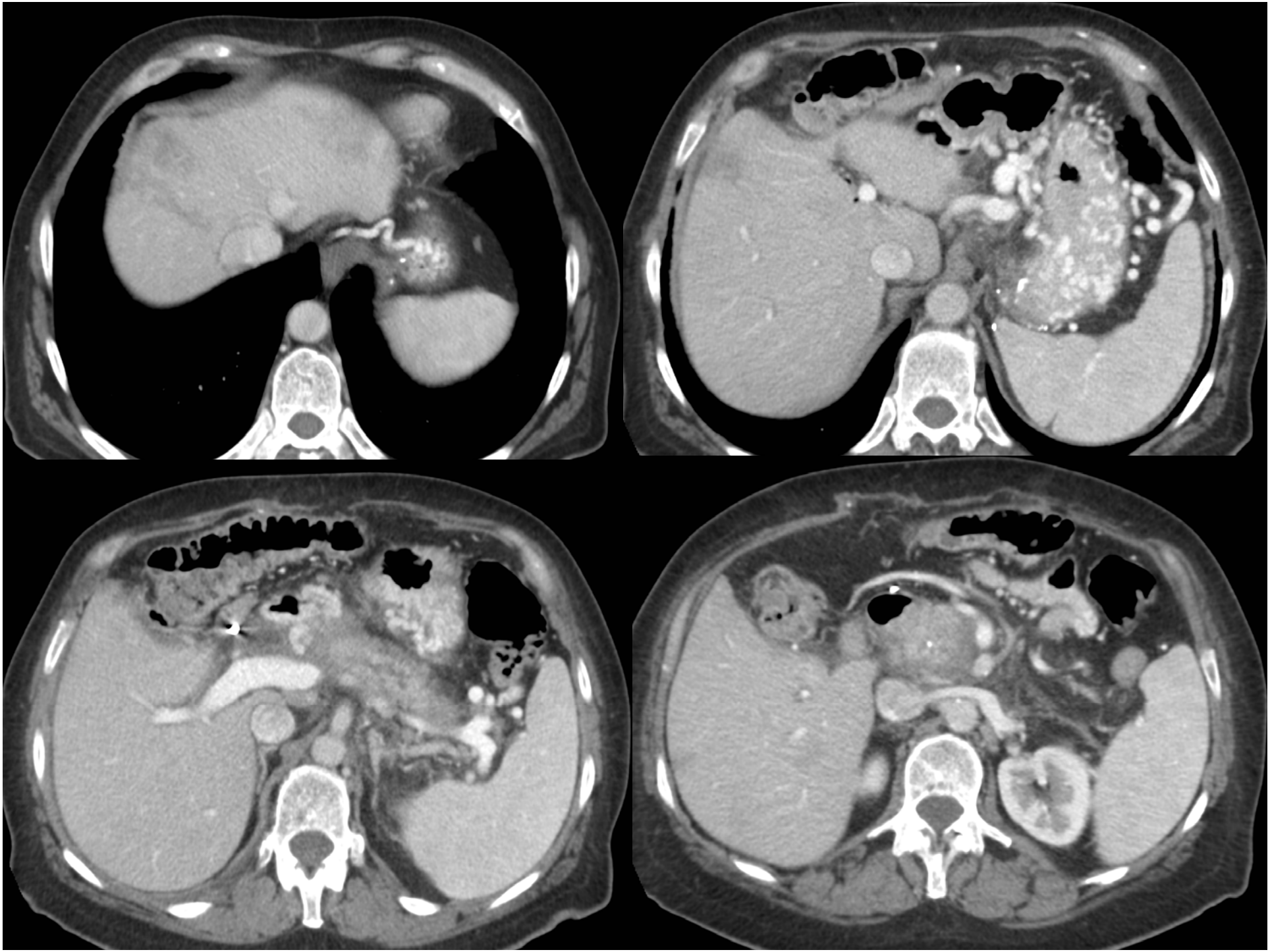
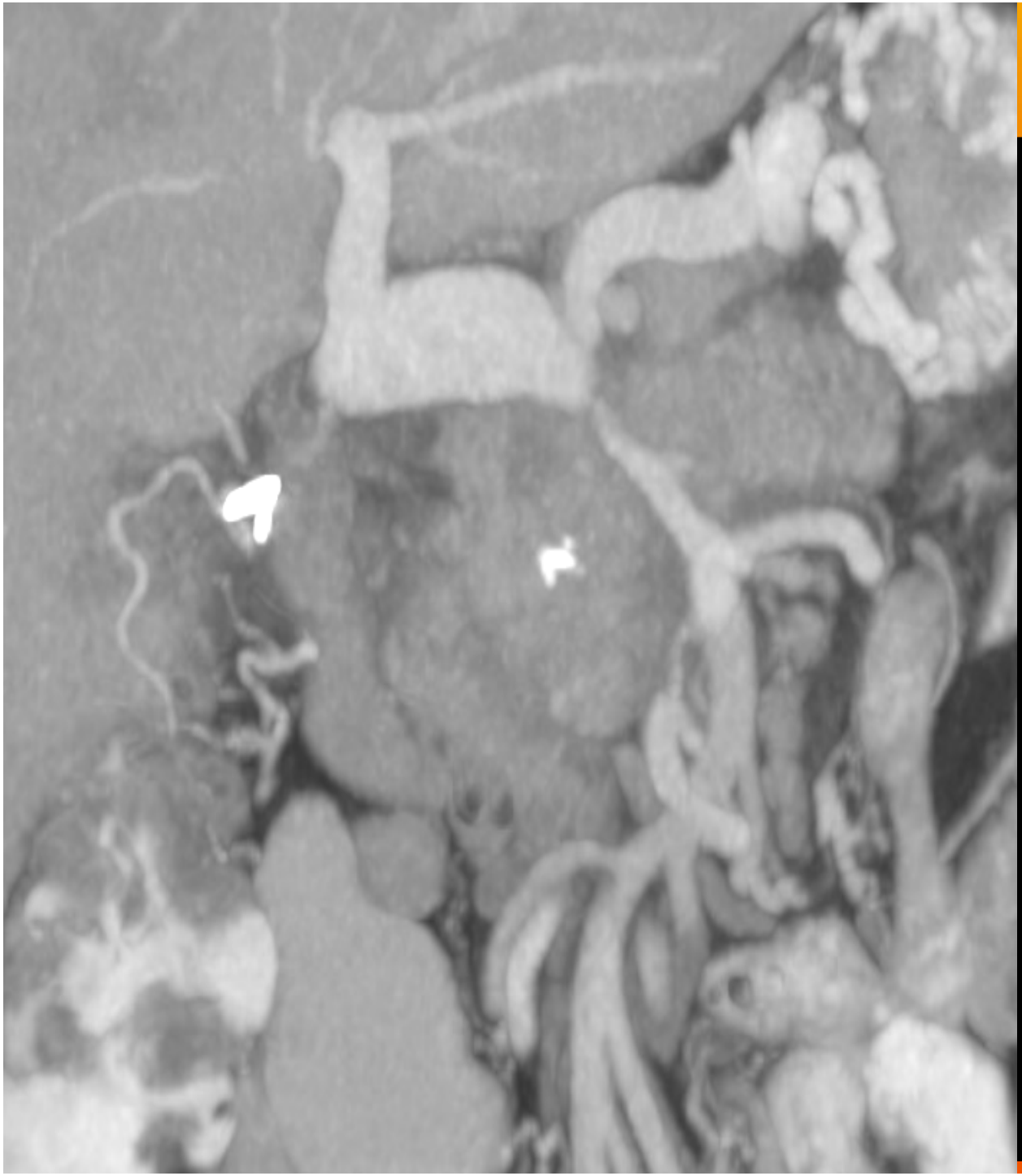
CIRA Case of the Day
June 2015

Case Courtesy of Dr.
Werner Harmse
University of Calgary

History

- 56 yr old male
- Upper abdominal pain
- History of chronic pancreatitis
- Presented with upper gastro-intestinal bleeding
- Upper endoscopy showed bleeding varices
  - Endoscopic treatment unsuccessful
- CT abdomen performed

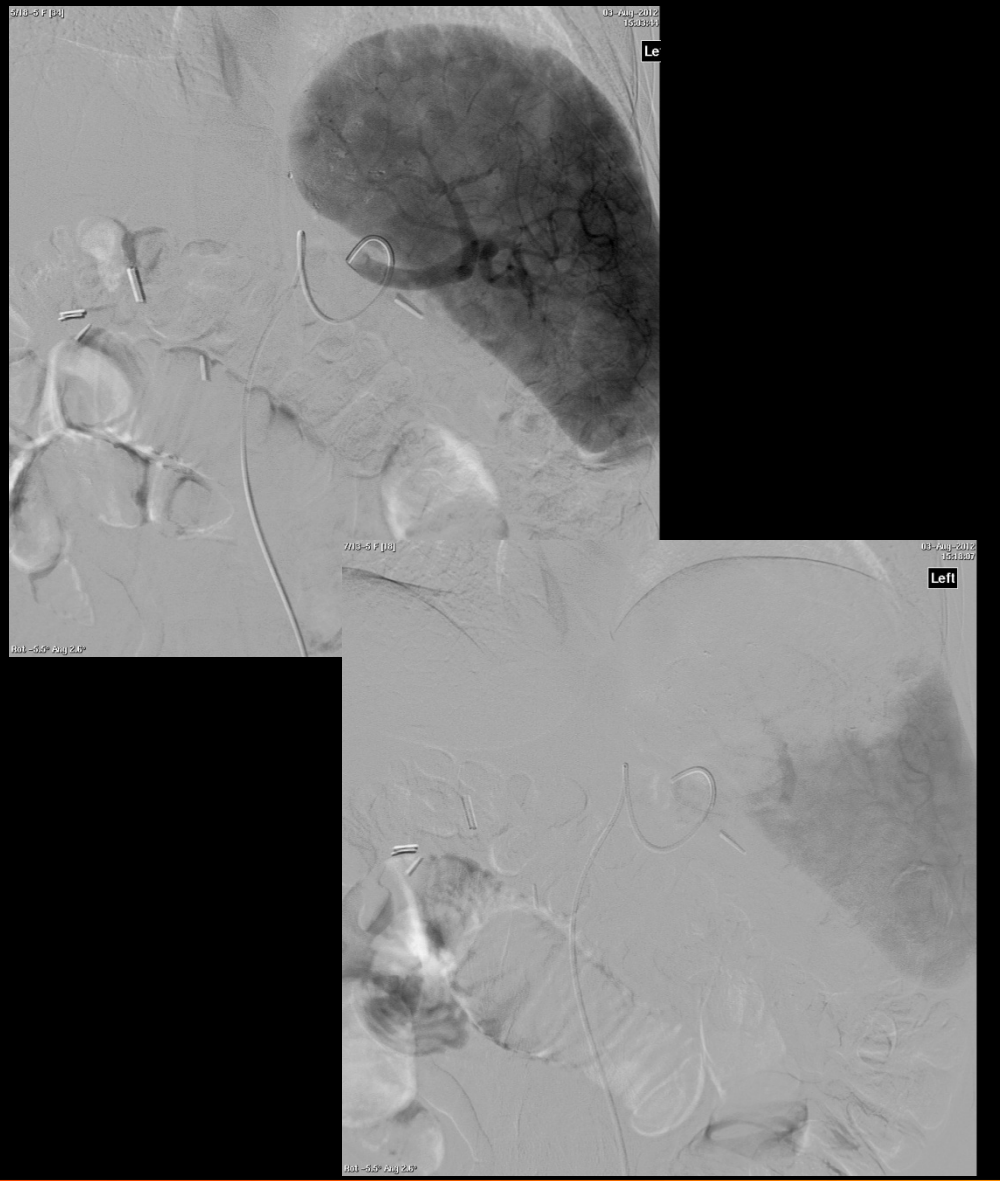




- Extensive gastric varices
- Stenotic sup. mesenteric vein/splenic vein confluence
- Pancreatic head mass – chronic inflammatory mass on pathology

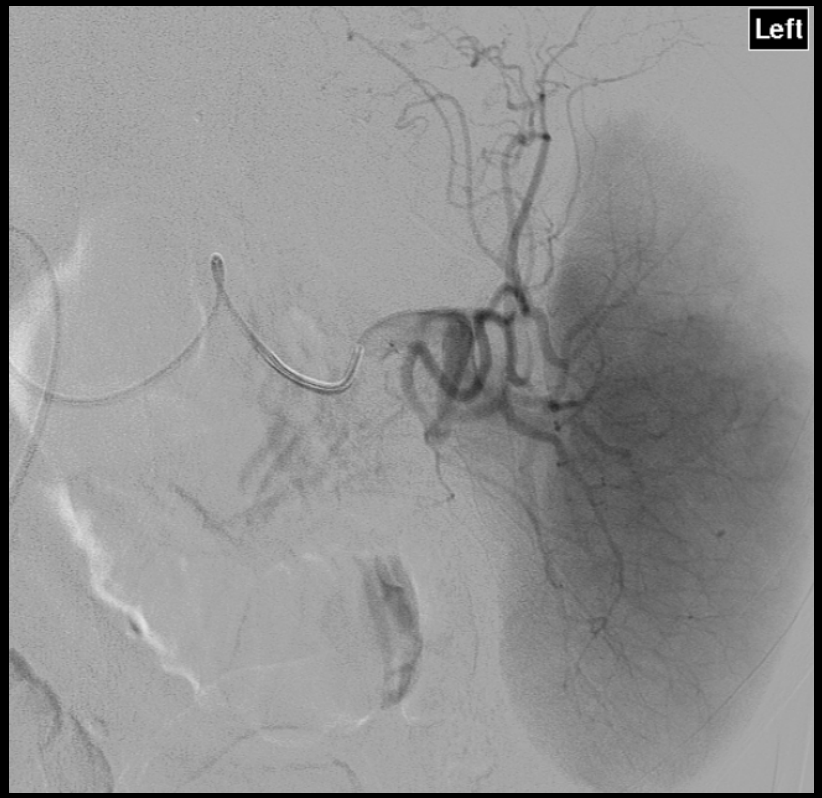
What could IR offer?

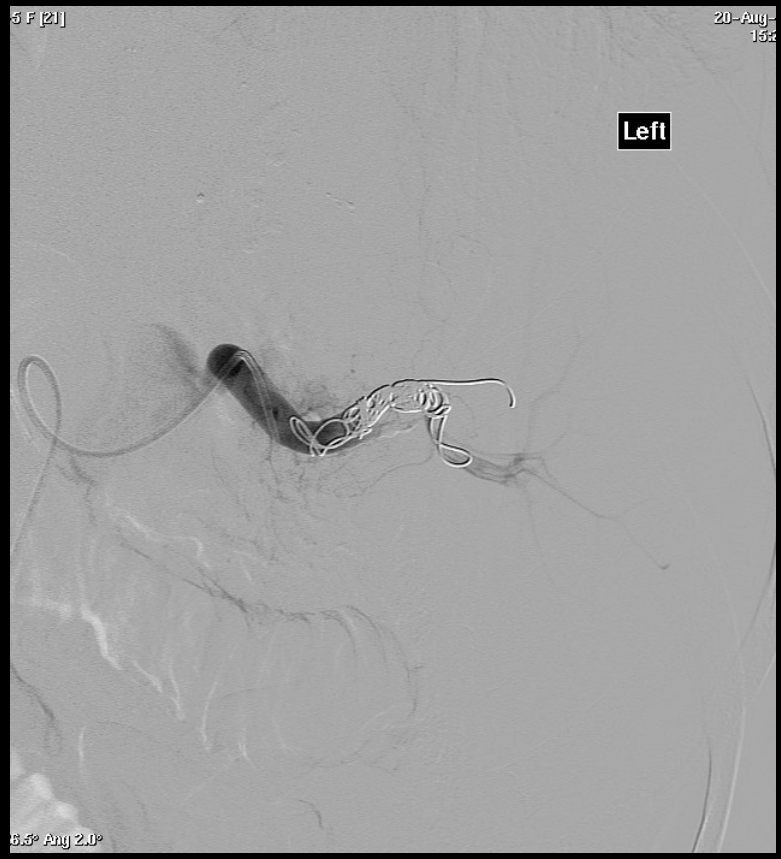
- Partial splenic embolisation performed to decrease variceal pressure and flow and control haemorrhage
- Superior half embolised using particles
- Variceal bleeding still continued



What next?

- Main splenic artery now embolised
- Coils used





Follow-up

- Variceal bleeding continued
- Endoscopic management attempted
  - Limited success
- Patient developed a splenic abscess > splenectomy

Splenic embolisation in portal hypertension[1]

- First used in 1973
- Used for different indications:
  - Improve liver function
    - Unclear mechanism – possibly related to increased to hepatic artery and SMV flow
  - Manage variceal haemorrhage
    - Reduces nr of bleeding episodes. Decreases splenic vein flow and pressure
  - Treat hepatic encephalopathy
    - Limited evidence
  - Treat hypersplenism
    - Increased blood counts may also improve coagulation status

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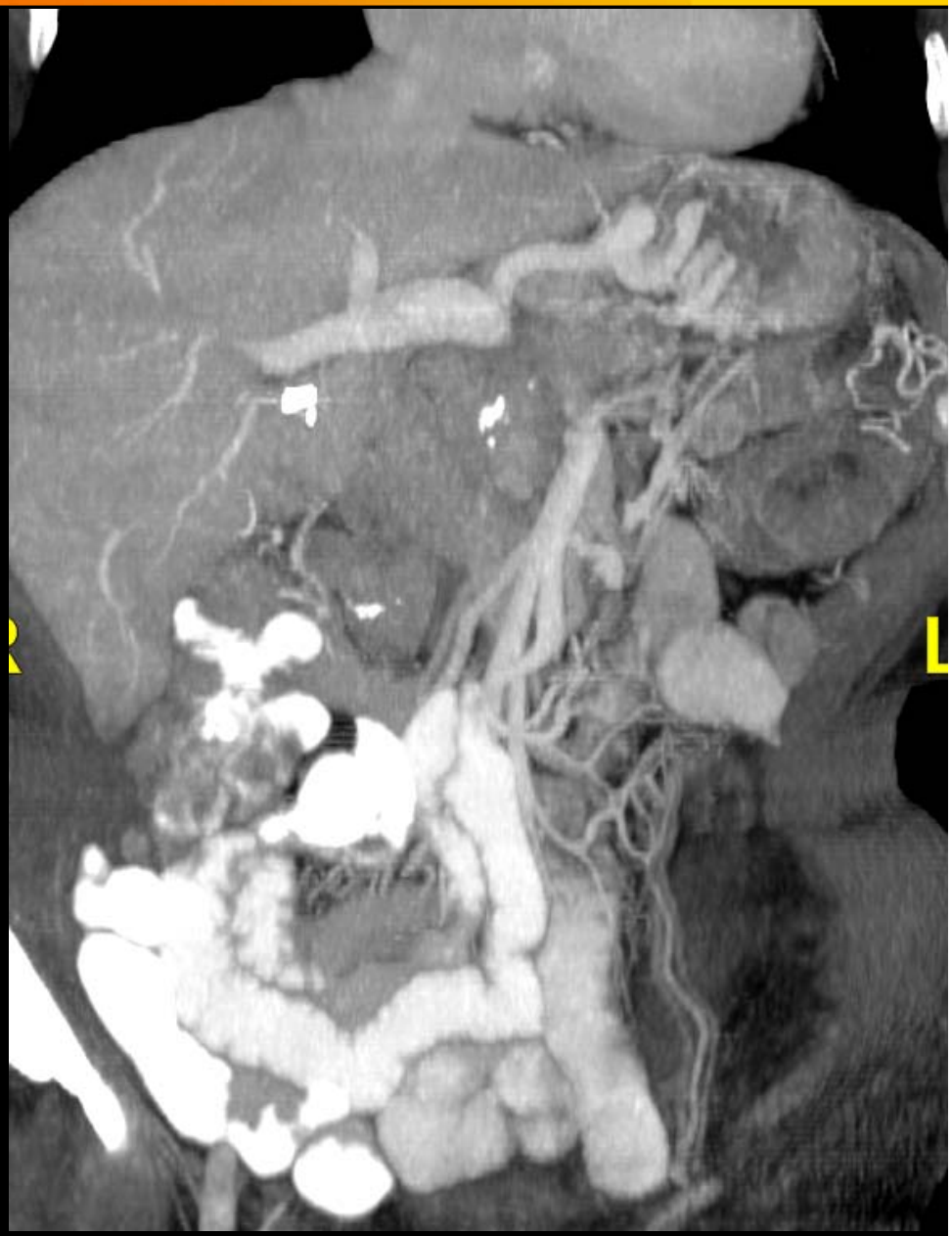
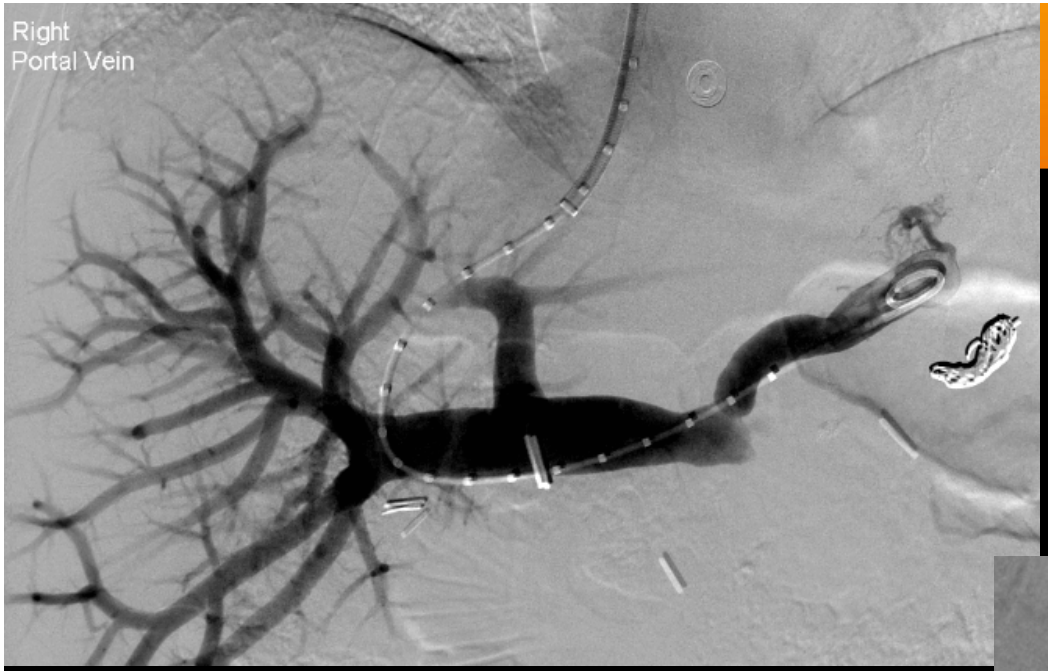
Splenic embolisations[1]

- Especially of value in sinistral (left-sided) portal hypertension
- Most patients experience post embolisation syndrome – managed conservatively
- Serious complications include abscess, pleural effusions, ascites and portal vein thrombosis
  - Generally related to splenic volume infarcted
  - Most aim for 40 – 60% of spleen
  - Particles most commonly used, but also gelfoam and proximal splenic artery occlusion
  - Antibiotic prophylaxis advised for up to two weeks

6 months later

- Variceal bleeding continued
- CT now showed complete occlusion in portal vein/superior mesenteric vein junction
- Transjugular intrahepatic portosystemic shunt requested (TIPS)





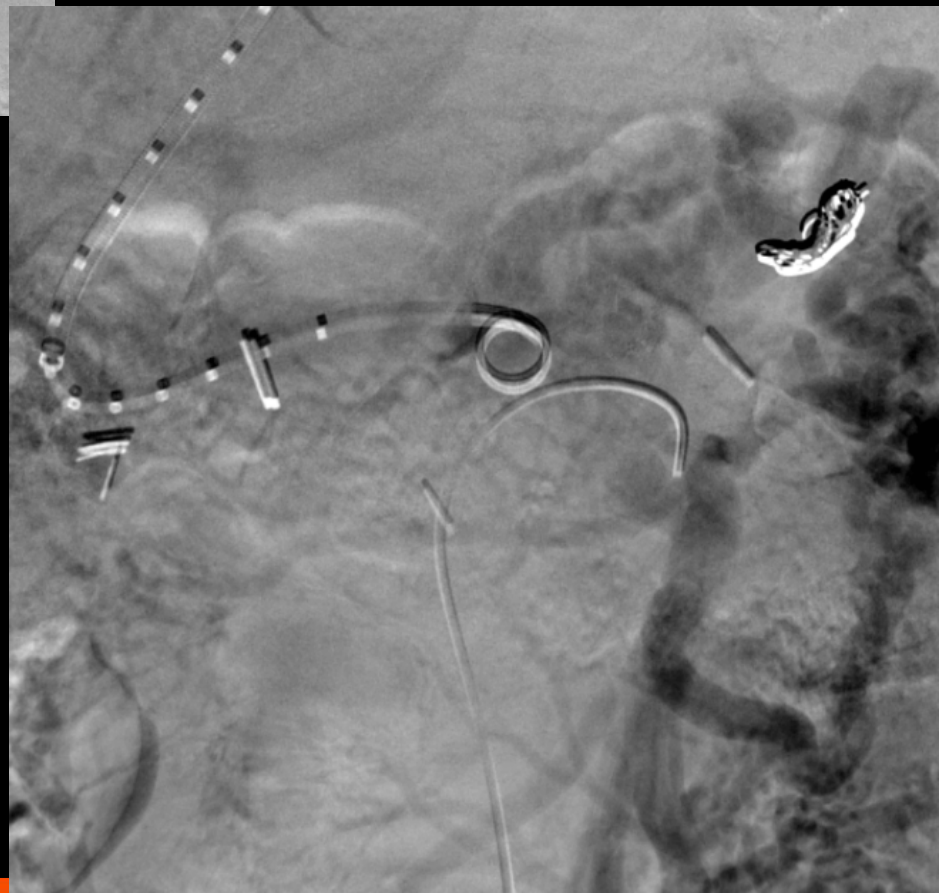
Portal venogram from position in variceal vein

No significant pressure gradient between main portal vein and IVC/right atrium

TIPS stent not placed

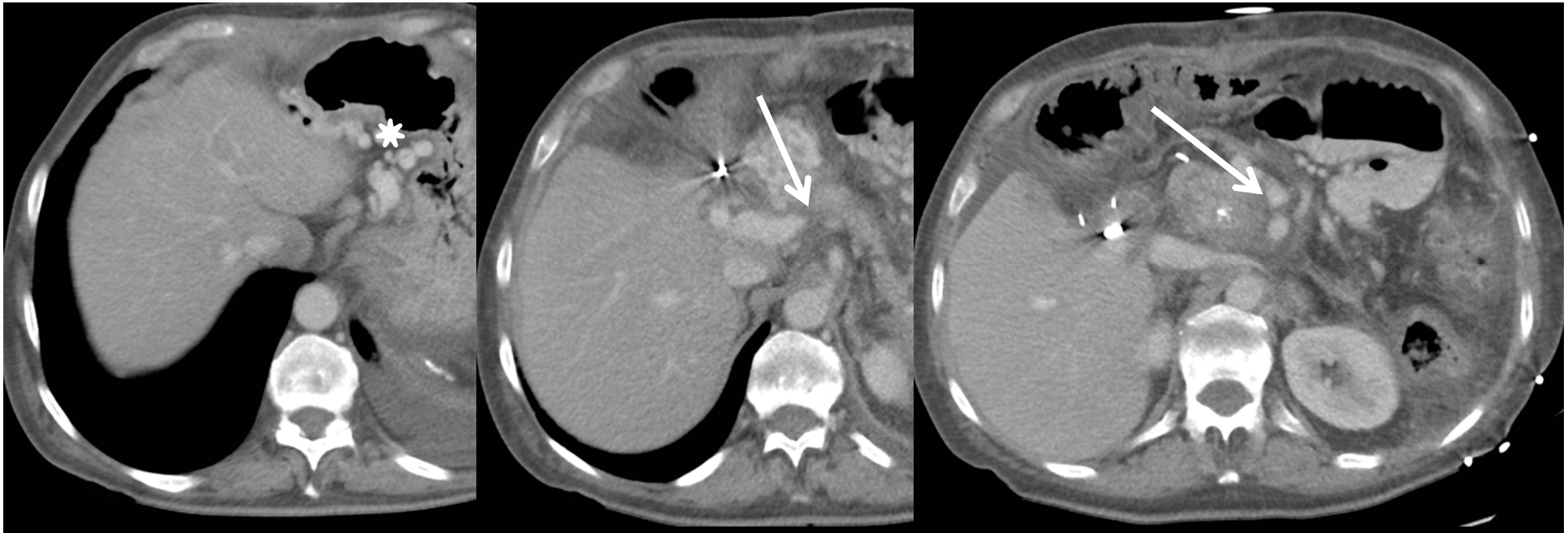
Late phase SMA injection

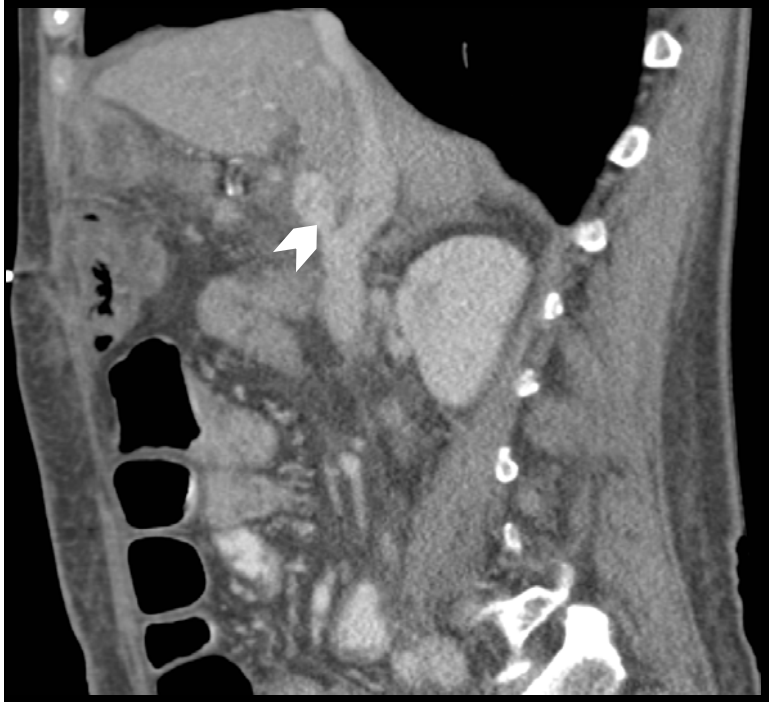
Complete occlusion of SMV demonstrated as well as multiple varicose veins



Further follow-up

- Despite absence of portal vein/right atrium gradient a surgical porto-caval shunt was created
- This still did not control haemorrhage
- Interventional radiology again consulted
  - What are the options?





Contrast enhanced CT scan

Axial images demonstrate the gastric varices (*) and occluded portal vein/SMV junction(arrows)

Sagittal reformat shows the surgical porto-caval shunt (arrowhead)

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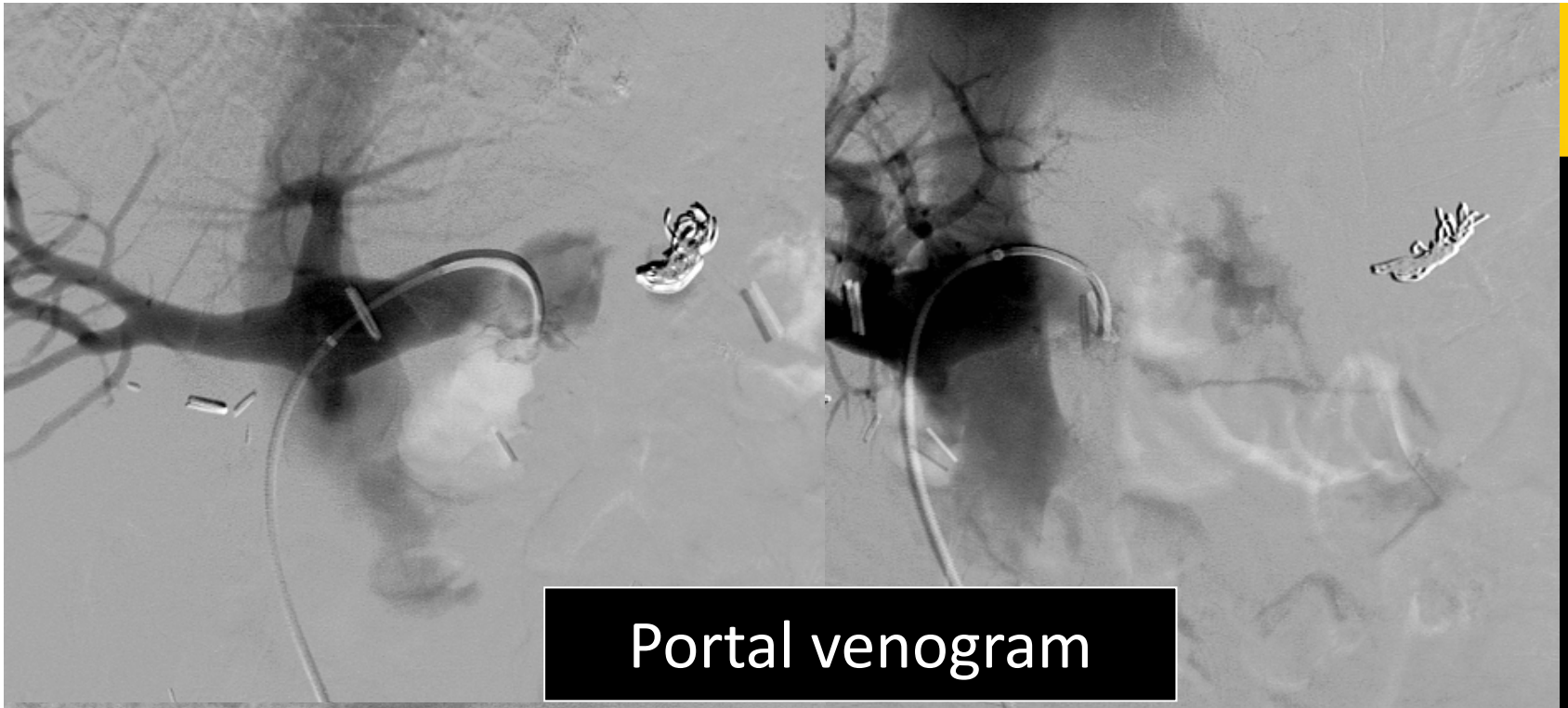
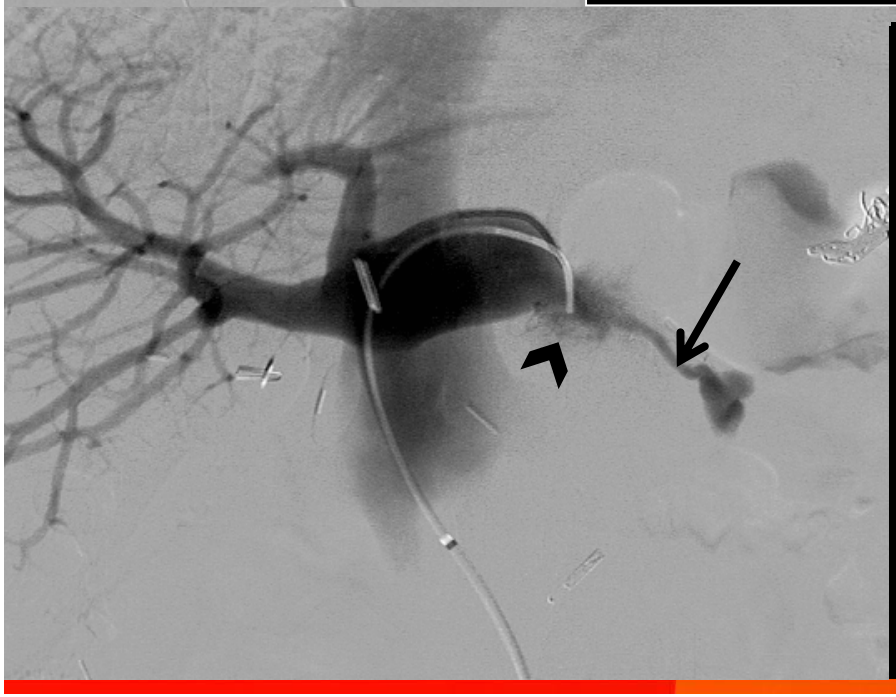
Planned intervention

- Recanalize portal vein/superior mesenteric vein
- Access via right common femoral vein via IVC and porto-caval shunt
- Use Powerwire® (radiofrequency wire) to cross occlusion



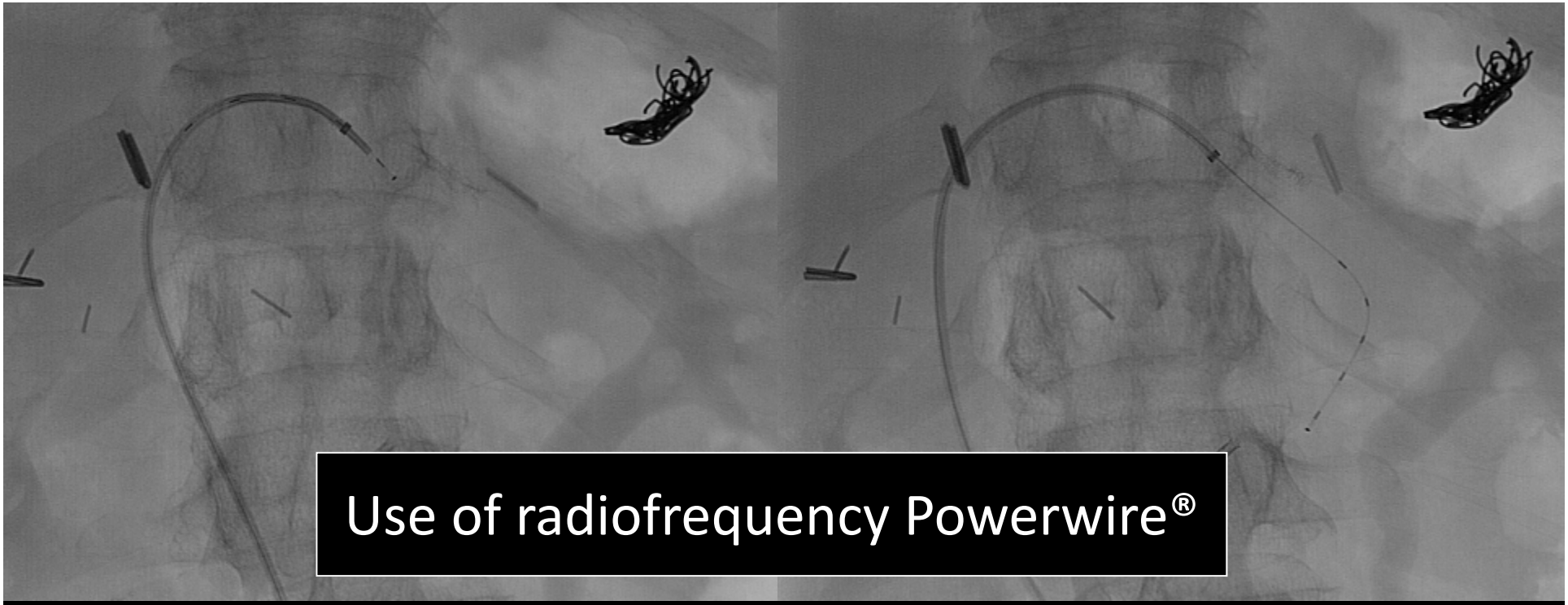
Portal venogram



Portal venogram with access via porto caval shunt

Completely occluded portal vein

Filling of small tract towards SMV (arrow) seen after a parenchymal blush (arrowhead)



Use of radiofrequency Powerwire®

It was not possible to cross occlusion using standard wire techniques

Radiofrequency wire now positioned at blind ending portal vein directed towards SMV

RF pulse was applied and wire and catheter advanced freely into SMV

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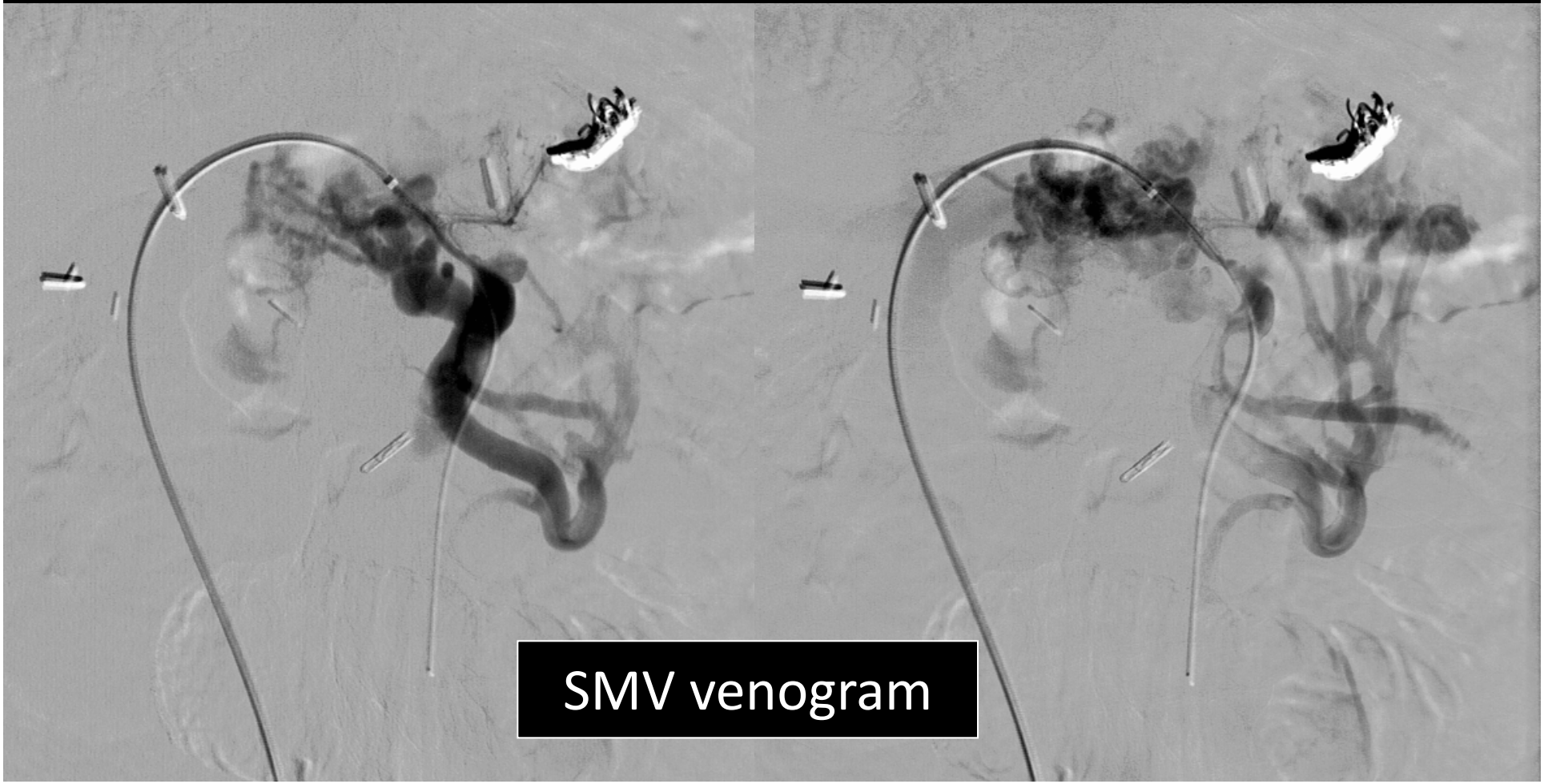
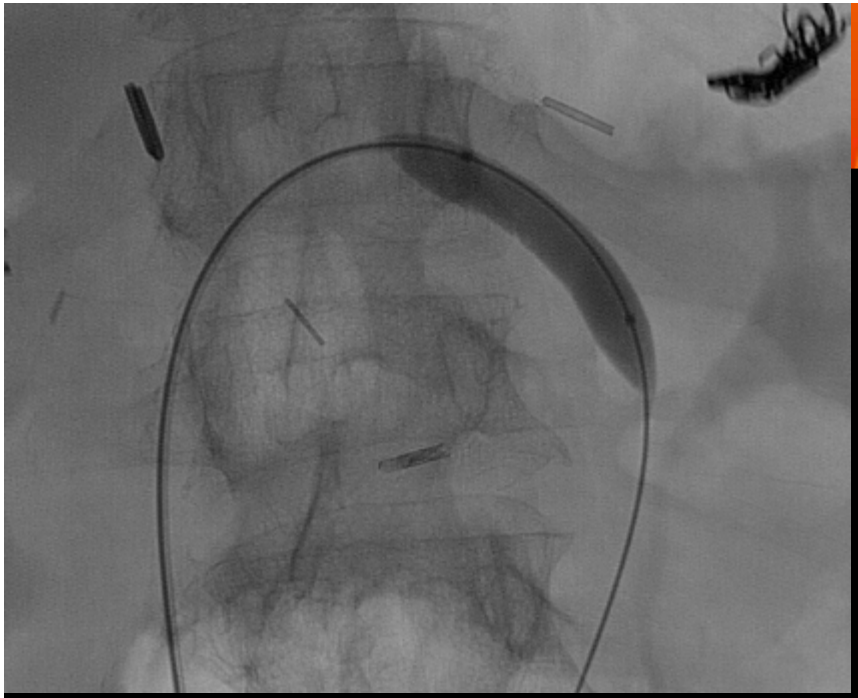
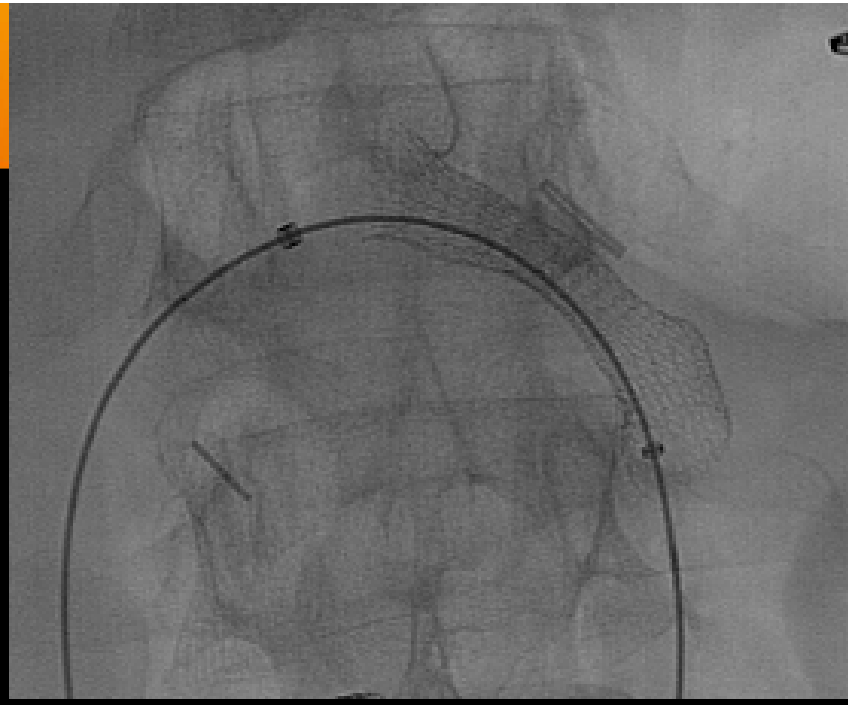
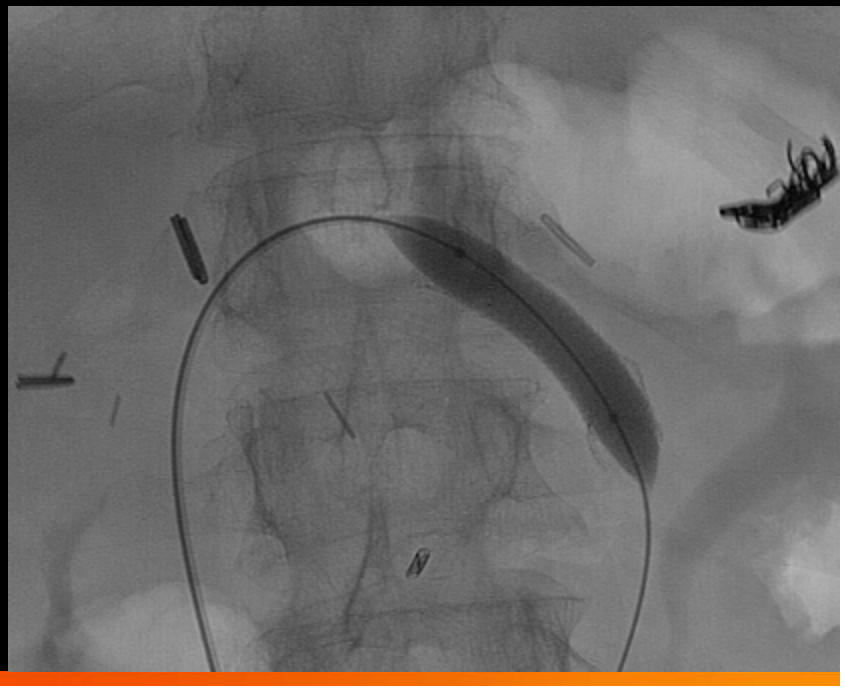
SMV venogram demonstrates prominent varices with occlusive stenosis in the SMV/portal vein junction







Balloon angioplasty was now performed (above), followed by placement of a 13 mm Viabahn stent (above right) and angioplasty within this stent (right)



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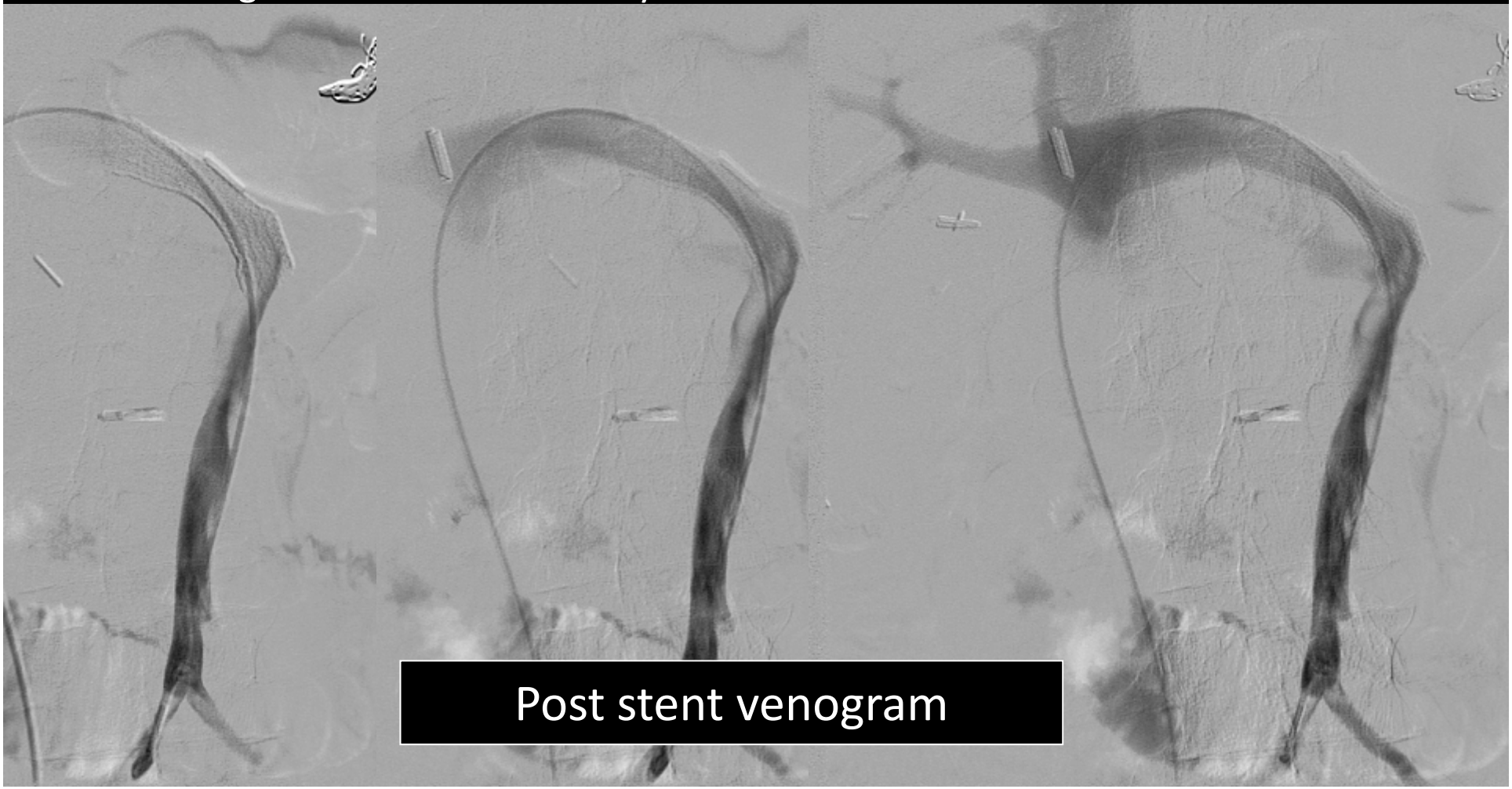
Venogram from the SMV shows direct inline flow through the stent into the main portal vein, as well as intra-hepatic branches and via the porto-caval shunt

No filling of the varices seen anymore



Post stent venogram

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Summary

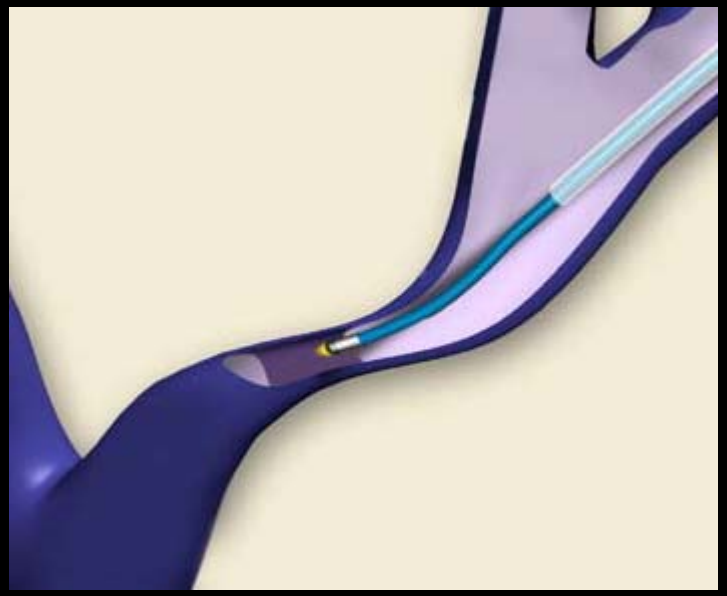
- Patient had variceal bleeding secondary to portal venous system stenosis and occlusion at splenic vein/SMV confluence - “Sinistral portal hypertension”
  - Normal portal vein with no liver disease
- Background cause was a chronic pancreatitis
- Initial management aimed at reducing splenic vein pressure and flow
- No value in creating a porto-systemic shunt
- Definitive management by re-establishing flow from the SMV into the portal vein using a RF wire
- 6 months post procedure patient has had no significant upper GI bleeding

RF wires

- Radiofrequency wires employ a short RF pulse at high voltage and low power to impart heat energy into the immediate adjacent tissue[2]
- This instantaneously vaporises cells in contact with the transducer, with limited collateral damage to adjacent tissues
- Technology originally used in interventional cardiology for transseptal punctures and in pulmonary atresia

RF wires

- The PowerWire™ RF Guidewire is used to cross lesions in occluded blood vessels that are difficult to cross with a standard guidewire[3]
- Wire available in different tip strengths and angulations
- Used in both peripheral arteries and chronic central venous occlusion
- Case series also published on the use in biliary occlusion[4]
- According to our knowledge this is the first use in the portal venous system



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References

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2. Baerlocher M, Asch M, Myers A. Successful Recanalization of a Longstanding Complete Left Subclavian Vein Occlusion by Radiofrequency Perforation with Use of a Radiofrequency Guide Wire. J Vasc Interv Radiol 2006; 17:1703–1706
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7. Thanks to Dr Eric Herget and IR group at Foothills Medical Centre performing the case.