

## Title

Innovative transcaval recanalization of the suprahepatic IVC and hepatic vein

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## Case description:

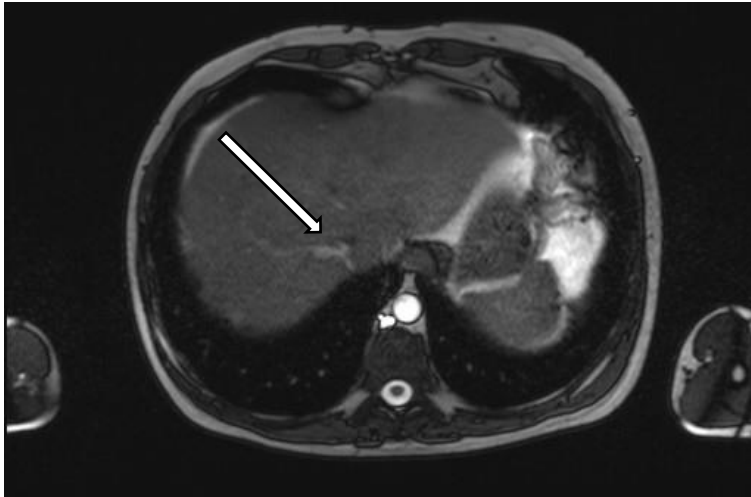
A 27 year old man with Behçet's disease, Factor V Leiden and antiphospholipid syndrome developed IVC and sagittal sinus thrombosis despite anticoagulation. He developed ascites from Budd-Chiari syndrome initially managed with high dose Warfarin (INR 3-4), Sprinolactone, Frusemide and salt restriction.

He presented to the Interventional Radiology Clinic for consideration of treatment instead of liver transplantation. CT & MRI demonstrated occlusion of the supra-hepatic IVC, partial thrombosis of juxta-hepatic, infrahepatic/suprarenal segments of the IVC and origin of right hepatic vein (RHV) (Fig 1).



Fig. 1: Coronal contrast enhanced CT  
White arrow: Occluded supra- hepatic IVC  
Black arrow: Partial thrombosis of juxt- hepatic and infra-hepatic IVC

Fig 1a



MRI: White arrow: Partial thrombosis at confluence of RHV and IVC

Fig 1b

Ultrasound-guided ascitic drainage was performed prior to the procedure.

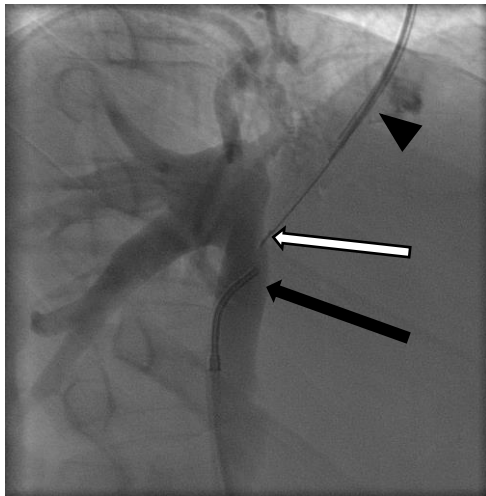
A venogram through the femoral vein revealed a patent but partially thrombosed subhepatic and juxtahepatic IVC, communicating with the middle and RHV. No discernible tract was seen connecting the juxtahepatic IVC and right atrium (RA). Subsequently a venogram performed via a jugular access demonstrated a stump of suprahepatic IVC (Fig 2).



Fig 2

Combined guidewire and catheter manipulation from cranial and caudal access failed to cross the occluded segment. Hence sharp recanalization of the suprahepatic IVC was performed. The angled, stiff Check Flo sheath accompanying a Transjugular Liver Biopsy (TJLB) set was placed into the stump

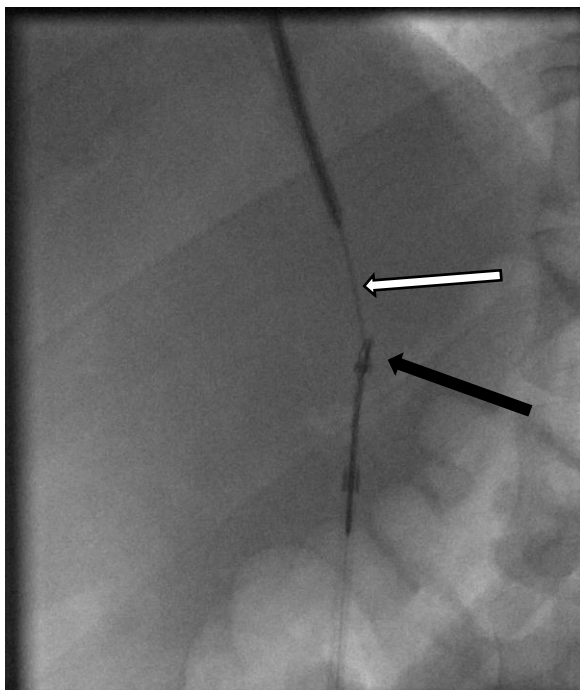
of IVC from the cranial access. The TJLB needle was advanced under fluoroscopy from multiple projections until entry into the juxtahepatic IVC was achieved (Fig 3).



White arrow: tip of TJLB needle  
Black arrow head: Check Flo sheath  
Black arrow: Catheter in juxta- hepatic IVC

Fig 3

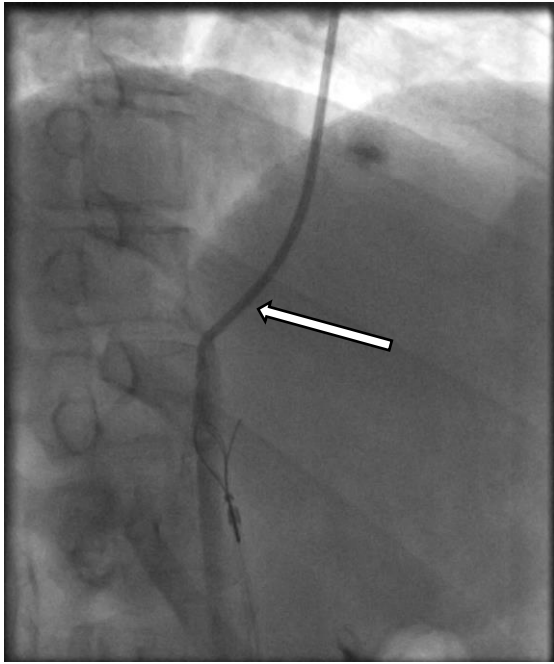
Initially the sheath accompanying the needle could not be advanced. Hence the needle tip was snared from below using an Ensnares device (Merit Medical) (Fig 4).



White arrow: TJLB needle  
Black arrow: Ensnares device snared to TJLB needle

Fig 4

With traction applied from below, the sheath was advanced over the needle and into the IVC (Fig 5).



White arrow: Check Flo sheath advanced over the TJLB needle.

Fig 5

A safety guidewire was placed from below with the tip in the right brachiocephalic vein. Subsequently the cranial access guidewire was retracted and access into the RHV was achieved (Fig 6) with a Cobra catheter

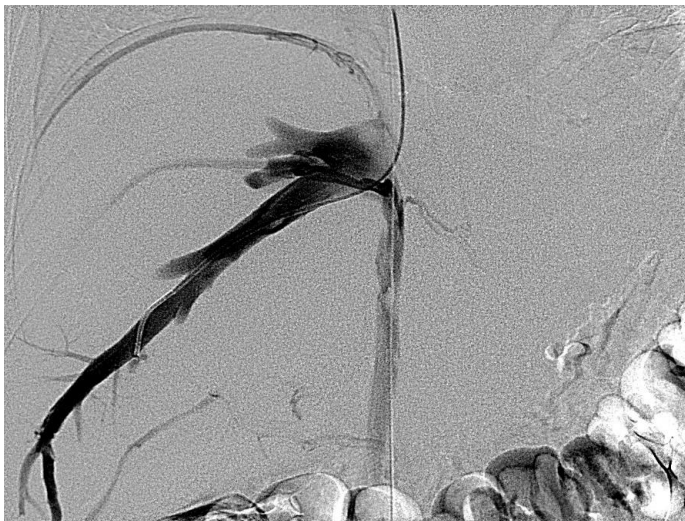


Fig 6

After pre-dilatation with a 16mm x 4cm balloon, a 16mm x 6cm self- expanding Zilver nitinol stent was deployed from the RHV to the IVC –RA junction resulting in inline flow (Fig 7).



Fig 7

Post-operative recovery was unremarkable. Ultrasound examination at Day 1 showed normal Doppler flow in the stented segment of hepatic vein/IVC and portal vein (Fig 8).

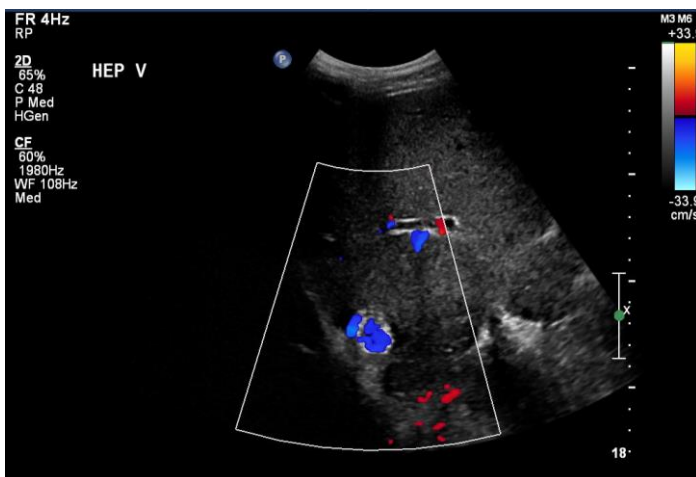


Fig 8a

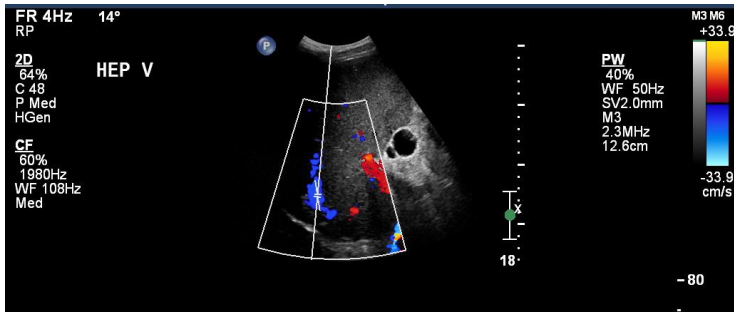


Fig 8b

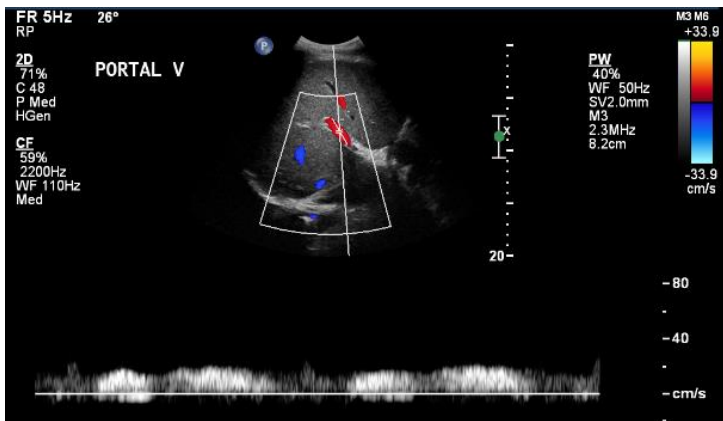


Fig 8c

The patient was able to stop all diuretics and return to a normal diet.

**Conclusion:**

This is a novel endovascular method for transcaval recanalization of the hepatic veins when conventional techniques fail.