

# TIPS in a Patient with Situs Inversus: Transcaval Portal Venous Access for Guidance

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## Purpose

Rare and complex variant anatomy complicates routine procedures. The infrequency with which certain anomalies are encountered, emphasizes the importance of utilizing alternative assistive techniques. Situs Inversus is a rare condition in which the internal organs are a mirror image of the usual anatomy. Endovascular procedures, such as TIPS, on such patients can be very challenging.

## Patient Presentation

An 18-year-old male with PMH notable for situs inversus (figure 1), biliary atresia status post hepatportoenterostomy, and liver cirrhosis complicated by portal hypertension and esophageal varices presented with melena and near syncope. IR was consulted for urgent TIPS due to refractory esophageal variceal bleeding.

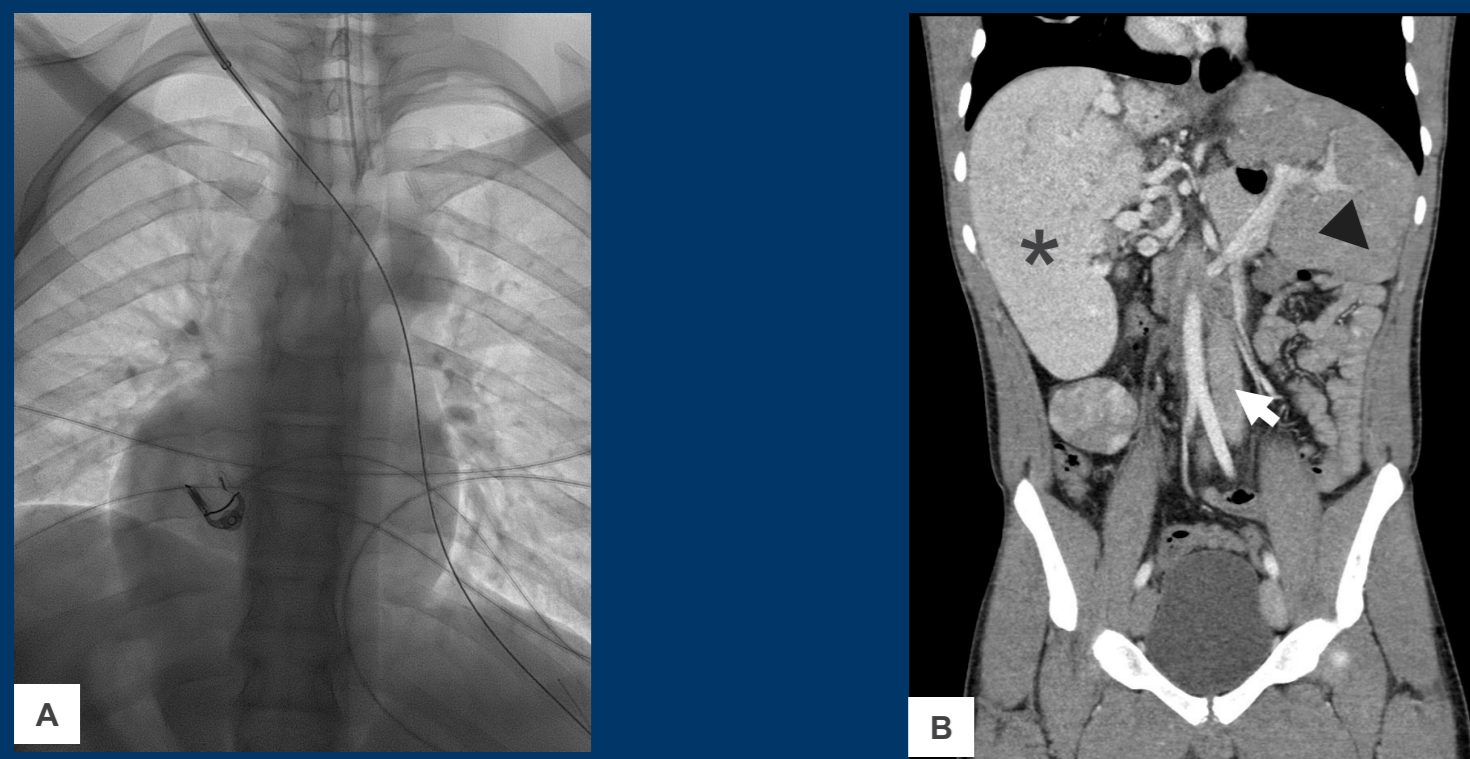


Figure 1: Chest spot fluoroscopic image (A) and coronal CT reformat (B) showing the patient's variant situs inversus anatomy. Note the left-sided IVC (arrow), right-sided spleen (\*) and left-sided cirrhotic liver (arrowhead).

## Intervention

Standard access was obtained in the right internal jugular vein and a 10-Fr sheath was advanced into a posterior hepatic vein. A 16-gauge Gore TIPS needle was advanced into the hepatic vein via the sheath, and multiple anterior passes were made through the hepatic parenchyma without successful cannulation of the portal vein.

In review of the cross sectional anatomy it was noted that the SMV was positioned just anterior to the left sided IVC (figure 2). The right femoral vein was then accessed and a 7-Fr stiffened TLAB sheath (Argon Medical Devices Inc, Frisco, TX) was placed in the infrahepatic IVC. A long Chiba needle (Cook Medical, Bloomington, IN) was passed through the sheath and directed toward the anterior wall of the IVC and into the SMV (figure 3A). An 0.018in guidewire was advanced into the portal vein to be used as a target for advancement of the TIPS needle. The relationship between the needle and guidewire was examined in multiple planes to determine the best trajectory (figure 3B).

Following this assistive maneuver, the TIPS needle was accurately advanced into the portal system. The endograft was deployed and proved to be patent with venograms demonstrating good flow (figure 3D). No recurrent bleeding or evidence of encephalopathy occurred post procedure. The patient remains well at six months follow up.

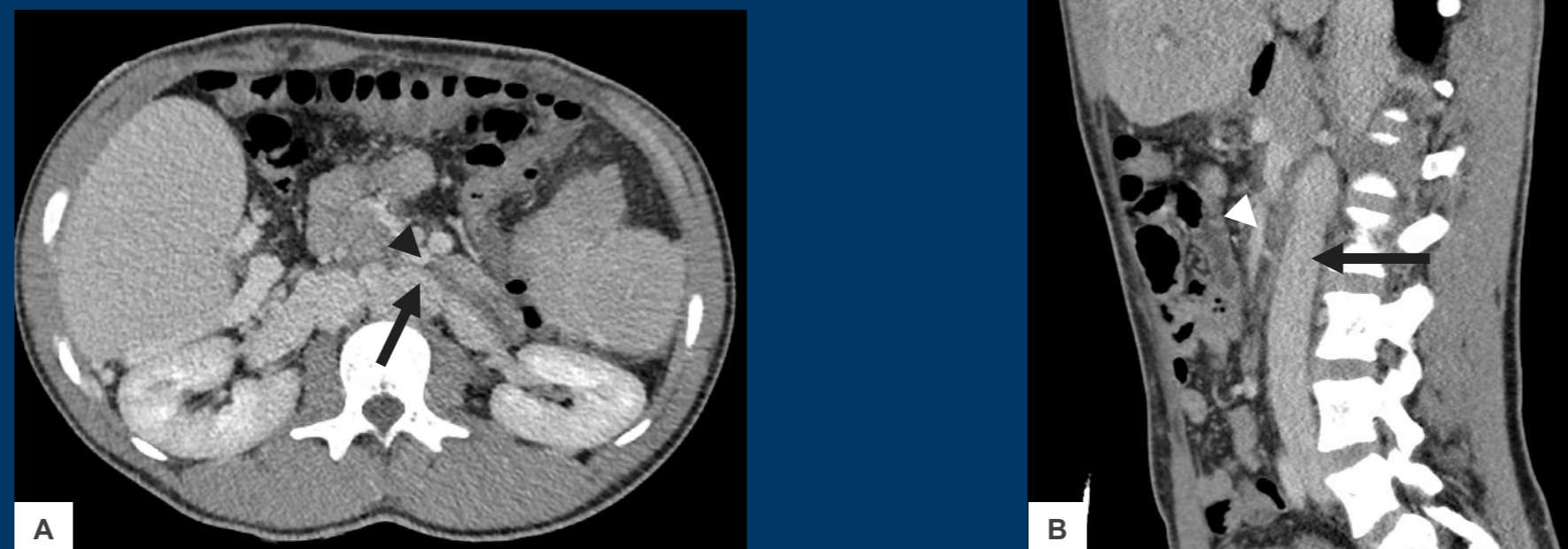


Figure 2: Axial (A) and sagittal CT reformats (B) showing the relation between the IVC (arrow) and SMV (arrowhead). These images were utilized to plan the successful transcaval approach.



Figure 3: The Chiba needle was advanced through a 7-Fr stiffened TLAB sheath and angled anteriorly into the SMV (A). An 0.018-in guidewire is advanced into the portal system and examined in relation to the TIPS needle (B). Successful TIPS creation (C).

## Conclusion

Rare anatomic variants pose a challenge when performing procedures, and a strong understanding of the anatomy and the assistive techniques available can prove invaluable. In this case, a patient with situs inversus underwent a challenging yet successful TIPS placement by utilization of a transcaval to SMV fiducial guidewire approach.

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