

# 44

## TIPS

### **Objectives:**

1. List the indications for TIPS.
2. List the contraindications for TIPS.
3. Describe the steps needed to create a TIPS.
4. Discuss how TIPS placement alters long-term survival.

The transjugular intrahepatic portosystemic shunt (TIPS) is a percutaneous procedure designed to decompress the portal system in patients with portal hypertension.

### **TIPS Indications**

1. Variceal hemorrhage which is refractory to medical management
2. Prophylaxis for recurrent variceal bleeding
3. Ascites or large pleural effusion which is refractory to medical management
4. Budd-Chiari syndrome

### **TIPS Contraindications**

1. Severe hepatic insufficiency
2. Poorly controlled encephalopathy
3. Portal vein occlusion
4. Polycystic liver disease
5. Hypervascular hepatic tumor

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## TIPS-Relative Contraindications

1. Active bleeding
2. Active infection

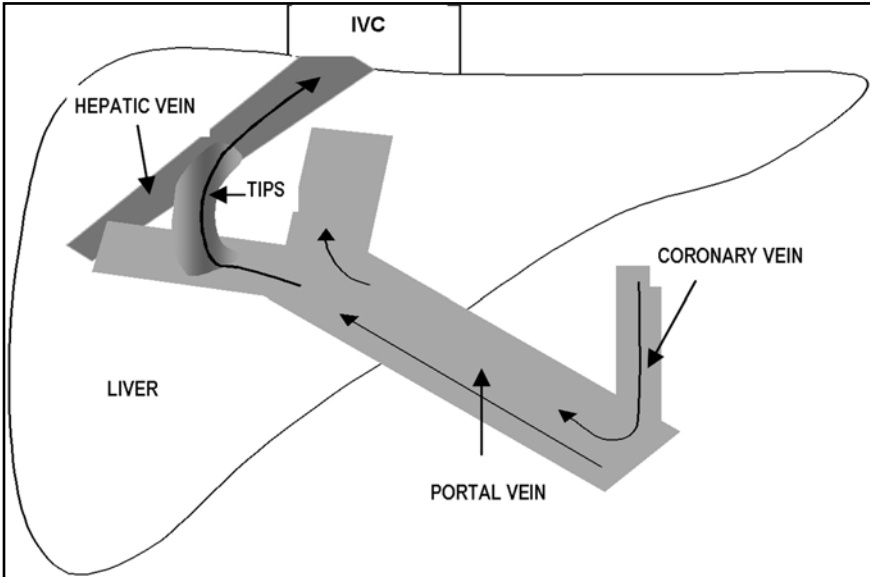
Once placement of the TIPS has been deemed appropriate, several questions must be answered. Is the portal vein patent by ultrasound or CT scan? If the varices are actively bleeding, TIPS is relatively contraindicated because of the high mortality associated with placement of a TIPS in an actively bleeding patient. Sometimes, however, it is the patient's only option.

## TIPS Placement

For placement of the TIPS, the right internal jugular vein is used for access. Once access has been obtained, a large, long sheath (10 French) is placed with its tip in the right atrium. Using an angled catheter, access is obtained to the right hepatic vein (or sometimes the middle hepatic vein). Simultaneous pressures are obtained between the hepatic vein and the right atrium. Next the catheter is "wedged" as peripherally as possible in the hepatic vein. A wedged hepatic vein pressure to right atrial pressure gradient (similar to inflating the balloon of a Swan-Ganz catheter to obtain left atrial pressures) is determined. A hepatic venogram is then obtained. The angled catheter is exchanged for one of several transhepatic needle access systems.

A large, hollow, directional needle is used to gain access through the liver, and via the needle, a wire is advanced into the portal vein. True simultaneous pressures are obtained across the liver in the hepatic vein and the portal vein. The tract is pre-dilated with an 8 mm balloon. A stent of appropriate length is deployed across the liver and dilated (Fig. 44.1). Simultaneous gradients are then obtained. If the gradient is too low, there can be a significant "steal" phenomenon from liver perfusion. If the gradient is too high, improvement in the varices or ascites/effusion may be inadequate. Pressure gradients greater than 12 mmHg are associated with an increased rate of variceal bleeding. If the pressure gradient remains elevated after TIPS placement, the stent may need to be dilated to a larger diameter to reduce the gradient to an acceptable level. If hepatic encephalopathy is not controlled after TIPS placement, the TIPS may actually need to be occluded.

An ultrasound is obtained prior to the patient's discharge and at subsequent regular intervals for follow-up after discharge to ensure patency of the TIPS (Fig. 44.2).



**FIGURE 44.1 - DIAGRAM OF A TIPS**

Through a percutaneous access from the internal jugular vein, the right hepatic vein is “connected” to the right portal vein branch via a transparenchymal tract. This tract is supported open utilizing a stent, frequently a Viatorr device. This allows the portal venous flow to decompress into the hepatic venous system and the associated varices to bypass the diseased liver

DIAGNOSTIC CRITERIA	1	2	3
ENCEPHALOPATHY	NONE	MODERATE	SEVERE
ASCITES	NONE	MODERATE	SEVERE
BILIRUBIN	<2	2-3	>3
ALBUMIN	>3.5	2.8-3.4	<2.8
PT	<14	15-17	>18

**FIGURE 44.2 - CHILD’S SCORE**

This classification scheme is used to assess the prognosis of chronic liver disease. To calculate a score, add the points from each category together. A is 5–6 points, B is 7–9 points, while C is greater than 10 points

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## Long-Term Survival

TIPS placement is successful in 96 % of cases. It is important to understand that TIPS placement does not alter the underlying liver disease. It only alters the manifestations of portal hypertension. Current transplant-free survival after a TIPS is 75.1 % at 6 months, 63.1 % at 12 months, 49 % at 24 months, and 38.1 % at 36 months (Salerno et al. 2007). It is important to calculate the MELD (Model for End Stage Liver Disease) score as this dramatically influences survival. As would be expected the higher the MELD score, the lower the overall survival (Ferral et al. 2004)

## References

- Ferral H, Gamboa P, et al. Survival after elective transjugular intrahepatic portosystemic shunt creation: prediction with model for end-stage liver disease score. *Radiology*. 2004;231:231–236.
- Salerno F, Camma C, et al. Transjugular intrahepatic portosystemic shunt for refractory ascites: a meta-analysis of individual patient data. *Gastroenterology*. 2007;133:825–34.