Transjugular Intrahepatic Portosystemic Shunts

A transjugular intrahepatic portosystemic shunt (TIPS) is a device that can help some people with advanced liver disease.

Advanced Liver Disease

The liver contains 2 important types of blood vessels. The portal vein carries nutrient-rich blood from the abdominal organs to the liver. The hepatic veins drain blood from the liver that eventually returns to the heart. Normally, these large veins are connected to each other by many smaller vessels. People with advanced liver disease (including cirrhosis) can have increased pressure in these small vessels, which can lead to high portal vein pressure, known as portal hypertension.

Portal hypertension can lead to serious complications, including varices and ascites. Varices are enlarged veins in the esophagus and stomach that can burst and cause massive bleeding and death. Ascites is an abnormal buildup of fluid in the belly that can lead to discomfort, infections, malnutrition, and death. The TIPS procedure decreases pressure in the portal vein and can thus relieve some of these complications.

When Is TIPS Recommended?

TIPS is mainly recommended in 2 situations. First, it can be used for variceal bleeding that fails to improve with medications or endoscopy. Second, TIPS can help with ascites that fails to improve with dietary changes, medications, or paracenteses (using a temporary drainage tube to remove fluid from the abdomen).

Liver transplantation is the definitive treatment for people with advanced liver disease. Undergoing a TIPS procedure does not prevent a future liver transplantation; in some cases, TIPS is required for it.

How Is TIPS Performed?

A TIPS procedure is performed by an interventional radiologist. A catheter (small flexible tube) is inserted into a large vein in the neck that leads to the hepatic veins. From there, the portal vein is found and a stent (metal tube) is placed to create a large channel. This allows for brisk blood flow through the liver. Afterward, pressures are measured across the liver to ensure that portal hypertension has improved. This procedure requires an overnight hospitalization to monitor for complications.

Risks and Complications

A TIPS procedure can place a large amount of stress on the heart and lungs because of the rapid increase in blood flow. Therefore, patients who undergo TIPS are first assessed for congestive heart failure (when the heart cannot pump blood properly) and pulmonary hypertension (elevated pressure in lung blood vessels). The TIPS procedure requires contrast, which can affect kidney function. Thus, kidney function is closely monitored before and after a TIPS procedure.

By shunting a fraction of blood flow from the portal vein to the hepatic vein, the TIPS procedure impairs some functions of the liver, such as the ability to filter natural poisons such as ammonia. The increased concentration of poisons can travel to the brain and cause hepatic encephalopathy (which causes confusion). Therefore, in people with advanced cirrhosis or history of recurrent confusion episodes, TIPS carries more risks. Treatment of this complication can include medications, narrowing the TIPS, and liver transplantation in some cases.

The procedure itself has risks such as bleeding, infection, and, rarely, death. Additionally, the TIPS can become deformed or narrowed. Routine ultrasound imaging and clinical evaluation are performed to ensure good TIPS function.

FOR MORE INFORMATION

National Institutes of Health
medlineplus.gov/ency/article/007210.htm

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Conflict of Interest Disclosures: The authors have completed and submitted the ICJME Form for Disclosure of Potential Conflicts of Interest and none were reported.