

Transjugular intrahepatic portosystemic shunt in partially thrombosed portal vein

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Case Type: Clinical Cases

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Patient: 59 years, female

Clinical History:

Cirrhotic female patient with ascites and hydrothorax was referred for TIPS creation. Right portal vein was thrombosed, so a combined percutaneous and transjugular approach was used to create a TIPS. Ascites and hydrothorax were resolved, but the patient died from liver failure.

Imaging Findings:

A 59-year-old female with a 10-year history of cirrhosis had been hospitalized several times for bleeding gastroesophageal varices. She responded well to sclerotherapy. During the last few months she developed severe liver insufficiency, with increased bilirubin levels, ascites, and hydrothorax refractory to medical treatment. She was referred for TIPS, while awaiting liver transplantation. Chest and abdominal CT showed ascites and right hydrothorax. Color Doppler ultrasonography of the liver showed that the main portal vein as well as the hepatic artery were patent, while the right portal vein was partially thrombosed. Prior to intervention the ascites was totally evacuated. The right jugular vein was punctured using US guidance, and the right hepatic vein was catheterized. A wedged hepatic venography using a hand injection of 20cc contrast failed to depict the portal vein (Fig1). Using sonographic guidance the right portal vein was punctured percutaneously using a 20-G needle; a 0.0018" inch guidewire was advanced through the thrombosed right portal vein into the main portal vein. Using the Accustic Percutaneous Access Set (Meditech, Boston Scientific) a 4-F straight catheter with multiple sideholes was subsequently placed into the main portal vein. Percutaneous portography via the straight catheter confirmed that the right portal vein was partially thrombosed. The main portal and the left portal veins were patent (Fig.2). Using a Rosch-Uchida Transjugular Access set (William Cook Europe) the right portal vein was punctured from the right hepatic vein, having the percutaneous portogram and the straight catheter as a guide. Only few drops of blood could be aspirated; a hydrophilic guidewire was manipulated through the thrombosed right portal vein into the splenic vein. A pigtail catheter was then placed and pressure measurements revealed a portosystemic gradient of 30mmHg (Fig 3a and b). Transhepatic tract dilatation and thrombus disruption was performed with 8mm and 10mm balloon catheters. Two Wallstent prostheses were subsequently deployed (90X62-mm and 90X77-mm). Final portography showed good patency (Fig 4). Portosystemic gradient was reduced to 12mm Hg. The percutaneous transhepatic tract was embolized with gelfoam pellets, and the catheter was removed. The patient had no hemorrhagic complications. The following days the ascites was markedly reduced, the hydrothorax had resolved

completely. Unfortunately she died 20 days later due to ongoing liver failure.

Discussion:

TIPS is effective in the management of cirrhotic refractory ascites and hydrothorax. In our patient the development of hydrothorax was the main indication for performing a TIPS. The presence of portal vein thrombus is considered a relative contraindication for performing a TIPS. Several authors have reported successful TIPS creation in the presence of portal vein thrombosis. While in patients with acute thrombosis of the portal vein the difficulty of the procedure is only minimally increased, in chronic portal thrombosis the procedure is very difficult. Recently TIPS creation between the right hepatic vein and a dilated collateral vein in a patient with cavernomatous transformation of portal vein was reported. We used percutaneous catheterization of the portal vein to facilitate transjugular portal vein access. This method of portal vein targeting, has been abandoned by most centers with a large experience in TIPS, because it is associated with increased incidence of peritoneal bleeding. Instead sonographic guidance of the transjugular needle entry into the portal vein is highly effective. With this approach the collaboration of two experienced radiologists is mandatory, one performing the TIPS, while the other finds the plane that simultaneously includes a satisfactory acoustic window, the point of origin of the needle pass (eg, right hepatic vein), the target (eg, portal vein), and the entire transparenchymal tract. We had to choose the percutaneous portal access because of the unavailability of a highly experienced sonographer during the TIPS procedure. Nevertheless our patient had no bleeding complications, presumably because of the successful tract embolization. Performing a TIPS in the presence of thrombus carries the risk of thrombus dislodgment into the portal branches and into the systemic circulation. Most of the disrupted thrombi flow towards the lungs with surprisingly almost no consequences. Embolization of portal branches increases liver dysfunction. Other authors experience suggests that these clots may resolve due to increased flow in the portal vein after successful shunt placement. Our patient's liver insufficiency was another serious concern. Liver failure with elevated bilirubine levels is a relative contraindication for TIPS creation, since the portal steal may increase the liver dysfunction. In such a case a patent hepatic artery may compensate for the portal steal. The clinical decision to perform TIPS was based on the need to manage our patient's debilitating refractory hydrothorax and ascites. Indeed her ascites and hydrothorax resolved after TIPS placement, but unfortunately her liver function deteriorated and she died.

Differential Diagnosis List: Portal thrombosis. TIPS successful

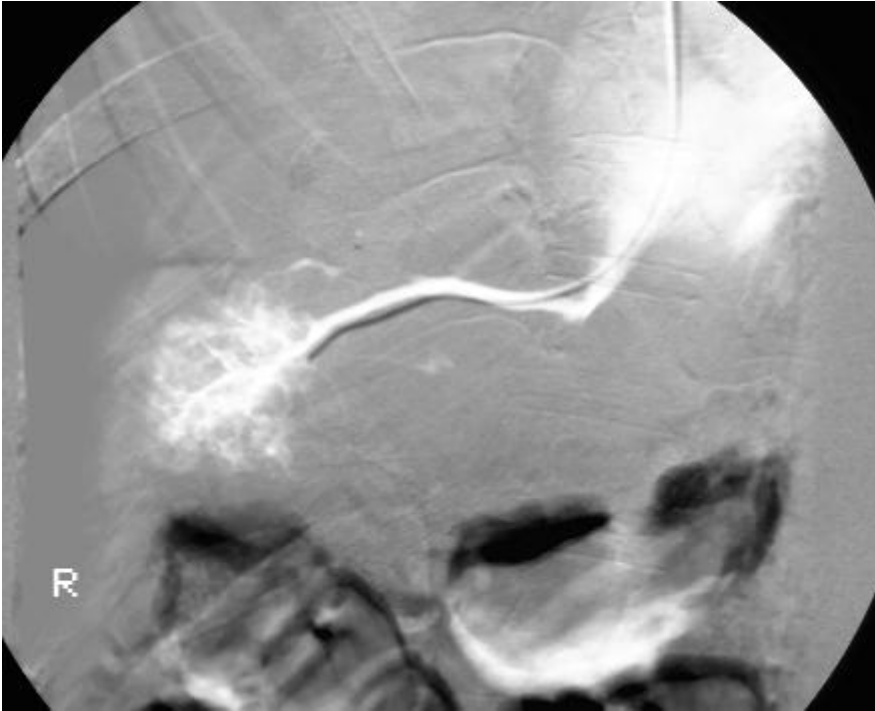
Final Diagnosis: Portal thrombosis. TIPS successful

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Figure 1

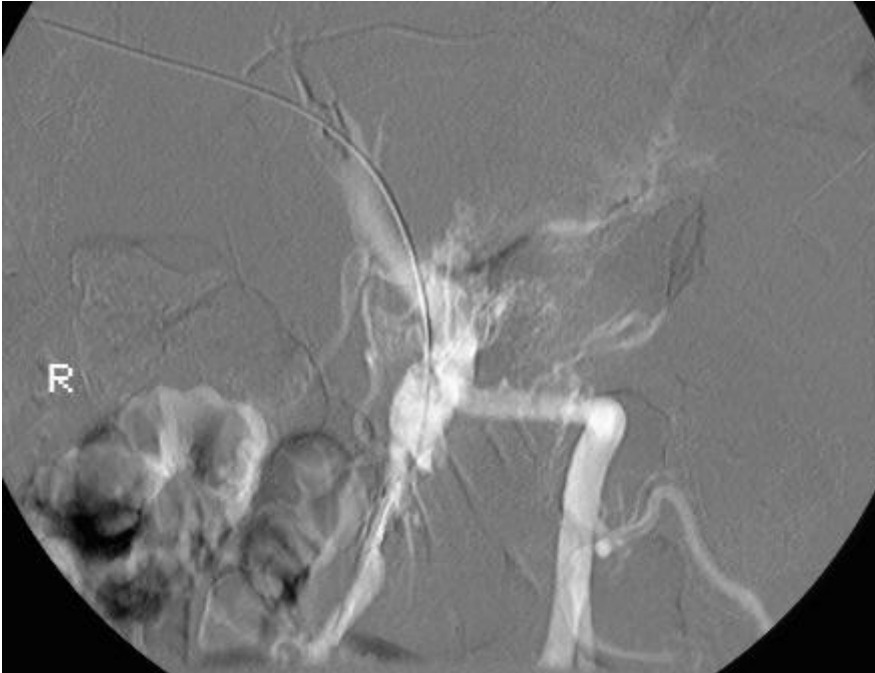
a



Description: Wedged hepatic venography performed via the transjugular approach fails to depict the portal vein. **Origin:**

Figure 2

a



Description: Percutaneous portography with a 4-F straight catheter shows that the right portal vein is partially thrombosed. **Origin:**

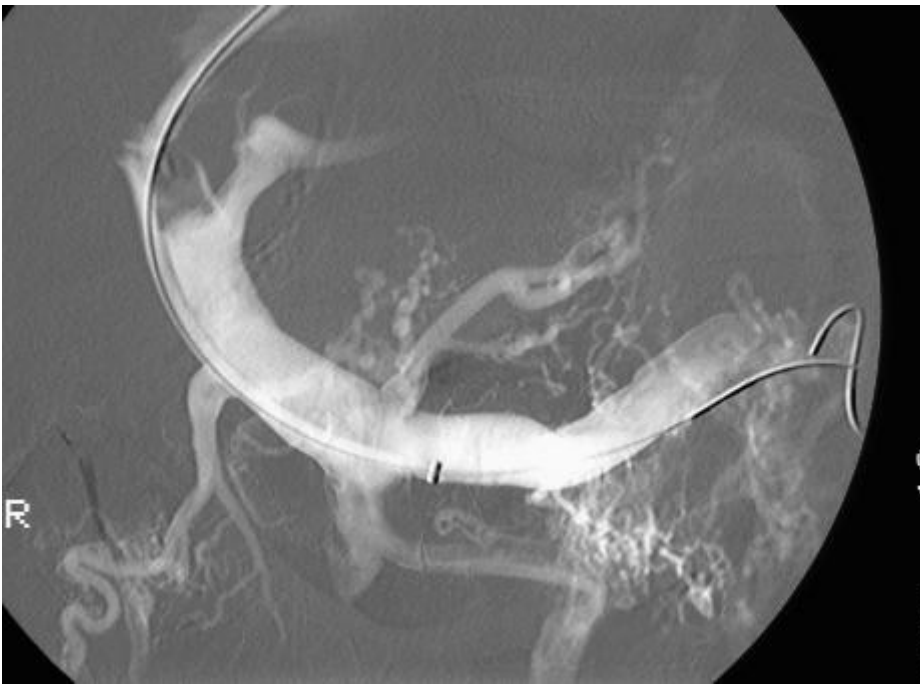
Figure 3

a



Description: The splenic and main portal veins are patent, while the right portal vein contains large amount of clot. Note the dilated coronary vein. **Origin:**

b



Description: Direct portography after dilatation with a 8-mm balloon better delineates the right portal thrombus. **Origin:**

Figure 4

a



Description: There is good shunt patency. Note absence of coronary vein filling. **Origin:**