

implement, it is hoped, a more rational and effective management of patients with severe PHG.

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PORTOSYSTEMIC SHUNT WITHOUT SURGERY

Zemel G, Katzen BT, Becker GJ, Benenati JF, Sallee S. Percutaneous transjugular portosystemic shunt. *JAMA* 1991;266:390-393.

ABSTRACT

Objective.—To determine the effectiveness of the Palmaz balloon expandable stent for the creation of a transjugular intrahepatic portosystemic shunt. The device is designed to achieve portal decompression in patients with variceal hemorrhage secondary to portal hypertension.

Design.—Transjugular intrahepatic portosystemic shunting was performed in eight patients during a 9-month period. Mean follow-up was 5 months.

Patients.—All patients had cirrhosis with portal hypertension and varices. Bleeding occurred in seven patients from esophageal varices and in one patient from hemorrhoids.

Main Outcome Measures.—Shunt patency and recurrent variceal hemorrhage.

Results.—Shunts created from a transjugular approach between a hepatic and a portal vein (diameters of 8 to 12 mm) lowered the average portosystemic pressure gradient from 36 to 11 mm Hg. Mean postoperative hospital stay was 7.7 days. Complete variceal decompression after transjugular intrahepatic portosystemic shunt placement was identified endoscopically in all eight patients. The patient treated for hemorrhoids rebled and was treated successfully by transfemoral balloon expansion of the shunt diameter from 8 to 12 mm. All shunts were patent at 1 to 9 months (mean, 5 months) of follow-up.

Conclusion.—Initial results suggest that transjugular intrahepatic portosystemic shunt is a safe and effective method of portal decompression for the treatment of variceal hemorrhage.

COMMENTS

The wide variety of treatments available for the management of variceal bleeding attests to the complexity of this problem. Treatments are commonly classified according to whether they arrest active bleeding, prevent rebleeding or prophylax against potential bleeding. Not all modalities have comparable efficacy for achieving these objectives. This study summarizes an early experience with a new and innovative technique that has potential broad applications for managing variceal hemorrhage. Briefly, the technique consists of nonsurgically creating a portosystemic shunt. Further studies will be needed to establish whether the safety, efficacy and cost of a transjugular intrahepatic portosystemic shunt (TIPS) compare favorably with currently available therapy.

The first issue will be safety. This study reported no acute complications of TIPS although we are not provided with data regarding the transfusion requirements associated with the procedure. A prior study of nine patients similarly treated had one procedure-related fatality (11%) (1). The study used a recent technical advance that allows TIPS placement without concomitant transhepatic portal venous puncture; this appears to simplify the procedure and may reduce morbidity. The explanation for an average postprocedure hospital stay of 7.7 days in the absence of complications is not stated in the manuscript.

Previous case reports have described TIPS in patients with poor hepatic function, in patients who had failed sclerotherapy and were deemed inoperable (2) and in a patient with intractable ascites caused by malignant biliary obstruction (3). Unlike the individuals treated in the reviewed study (mostly Child's class A or B), most patients who have variceal hemorrhage are class C cirrhotic patients (4). For TIPS to become an accepted alternative for reasonable operative candidates, the morbidity and mortality rates associated with the procedure must be no higher than portosystemic shunting in patients with similar severity of liver disease.

The second issue will be efficacy in the prevention of

rebleeding. The one patient who rebled in this study apparently had suboptimal reduction of portal pressure (from 38 to 18 mm Hg) and required stent expansion to lower the portosystemic gradient to 8 mm Hg. What percentage of patients in larger studies will achieve adequate portal decompression to prevent variceal rebleeding? Will these figures compare favorably with the effectiveness of surgical shunts (5)? What will be the duration of shunt patency after TIPS? The mean follow-up in this study was only 5 mo, and two patients required balloon angioplasty of the stent to provide better decompression during this follow-up. If the duration of TIPS patency is shorter than that achieved by surgical shunting or if prolonged patency requires frequent interval venous portography and angioplasty, the procedure may be less applicable than anticipated.

The final issues to be determined are those of long-term complications and the relative cost of TIPS compared with other alternatives. The authors report that no patient had severe hepatic encephalopathy develop after TIPS, although we are not told whether milder forms of encephalopathy occurred. One would expect that once adequate portal decompression is achieved, encephalopathy will occur at a similar rate to that after surgical shunting (6). Finally, TIPS will have to be compared with medical therapy and sclerotherapy. Most clinicians use sclerotherapy as a first-line therapy for the prevention of variceal rebleeding and reserve surgical shunts for sclerotherapy failures, noncompliant patients or patients living in geographically remote areas with limited access to medical facilities (7). We must also consider what effect TIPS will have on subsequent liver transplantation. Presumably avoiding dissection of the porta hepatis will reduce the complexity of subsequent liver transplantation and thereby may reduce postoperative mortality and morbidity rates (8).

TIPS is an exciting new nonsurgical technique for managing variceal hemorrhage caused by portal hypertension. It is unlikely that this procedure will entirely replace other available techniques; rather, it will most likely be indicated for the prevention of rebleeding in selected groups of patients. Definition of these patient groups awaits results from larger studies that are needed to establish the safety and efficacy of TIPS compared with more well-established techniques for managing variceal hemorrhage.

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PERCUTANEOUS TRANSJUGULAR PORTOSYSTEMIC SHUNT: COMMENTARY ON THE TECHNICAL ASPECTS OF THIS NEW PROCEDURE

COMMENTS

Transjugular intrahepatic portosystemic shunt (TIPS) is an exciting new interventional procedure for the treatment of portal hypertension that is being investigated at several institutions, including the Miami Vascular Institute. In its current stage of development, TIPS should be performed only in a setting that is as ideal as is possible. Angiographic laboratory prerequisites for the performance of this procedure include high-resolution C-arm fluoroscopy, digital subtraction angiographic capability, and equipment and personnel to provide the patient with adequate analgesia, sedation and monitoring during the procedure. High-quality ultrasound should be available. Operator skills must include experience with standard catheter-guidewire manipulations and angioplasty techniques and familiarity with intrahepatic anatomy and stent deployment protocols.

TIPS presents several technical challenges to the experienced interventionist that were not detailed in the recent JAMA article by Zemel et al. Transjugular, fluoroscopically guided needle puncture of a central portal vein branch by way of a hepatic vein is a technique still in evolution. Several methods to assist in aiming the needle have been used, including transabdominal placement of a portal vein catheter, directing the puncture toward the expected location of the portal vein as demonstrated on previous computed tomography or arterial portography and directing the puncture toward the portal vein under a combination of fluoroscopic and ultrasound guidance. The first method requires a transabdominal puncture, a possible source of peritoneal hemorrhage. The latter two methods avoid this possible complication but may require multiple intrahepatic needle passes with a 16-gauge needle—a possible source of intrahepatic pseudoaneurysm formation. After an