

## TIPS and the new criterion for indication of liver transplant in Brazil

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TIPS (transjugular intrahepatic portosystemic shunt) intervention is a non-surgical therapeutic procedure for reducing portal pressure in cirrhotic patients. The procedure consists in creating a shunt communicating the hypertensive vascular territory (portal vein) with another with lower pressure (hepatic vein–right atrium), by interposition of a tubular structure (metal stent). The first TIPS was experimentally performed in 1969 by Rösch et al. At that time, however, the TIPS could not be applied in the clinical practice due to the absence of appropriate instruments and materials for the technique performance, and, mainly because of the inexistence of structures to maintain a prolonged permeability of the shunt inside the hepatic parenchyma. The greatest development of this minimally invasive technique occurred approximately twenty years ago, with the manufacturing and refinement of catheters, dilatation balloons, and mainly with the development of metal stents. It was at this time that Richter et al. succeeded in performing the first TIPS in humans. Presently, the technological evolution of the stents utilized in the TIPS technique has been so great that, with the new stents with e-PTFE, the permeability surpasses 90% in a two-year follow-up, a satisfactory period of time to wait for a liver transplant.

Since the TIPS introduction in the clinical practice, it has become more and more known and indicated as a percutaneous treatment for portal hypertension complications. Indications have increased, and currently TIPS has been successfully performed in cases of acute and recurrent variceal bleedings refractory to clinical and endoscopic treatments, refractory ascites, cirrhotic hydrothorax, Budd-Chiari syndrome and veno-occlusive disease. Considering the satisfactory results, other diseases like hepatorenal syndrome, hepatopulmonary syndrome and diffuse bleedings

from portal hypertensive gastropathies (intestinal varices, hypertensive colopathy, stomal and rectal varices, portal hypertensive stomatopathy and caput medusae) also have been treated with TIPS.

All of the above mentioned factors reinforce the indication for a minimally invasive procedure with scientifically proved satisfactory results. However, it should be remembered that, in spite of many patients presenting an extremely favorable evolution, with shunt permeability for more than five years, the patient, his/her family and the medical team should be informed that TIPS is intended to be a “bridge” to the liver transplant.

Recently, the criteria governing livers distribution in the transplants line were changed. The Câmara Técnica do Fígado (Technical Chamber of the Liver), of Ministry of Health, has replaced the chronological criterion (time in the liver waiting list) with the case severity criterion. Philosophically, this principle is correct, and is adopted by any emergency service in all over the world: the most urgent cases take priority over the less severe ones. In terms of liver transplant, this change in criteria may yet have the salutary result of eliminating an artificial demand. Considering the long delay to get an organ for transplant, clinicians enroll their patients with chronic hepatic diseases in the liver waiting list much before they actually need to be submitted to the procedure. A research performed by the Ministry of Health shows that 61% of waitlisted patients have not an indication for the surgery yet. According to the Chamber proposal, the severity evaluation will be based on the MELD (model for end stage liver disease), a mathematical model that utilizes three simple and objective laboratory tests, attributing a grade for each patient. The higher the patient’s score, the worst his/her clinical condition. The MELD has been successfully adopted in the USA since 2001.

The MELD is based on three laboratory parameters easily obtained in any chronic hepatopathy routine. The MELD score is the result from the following equation:

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MELD =  $9.57 \times \log_e$  creatinine mg/dL +  $3.78 \times \log_e$  bilirubin (total) mg/dL +  $11.20 \times \log_e$  INR + 6.42, the resulting number being rounded up to a whole number. The maximum creatinine value must be up to 4. Currently, the reference value accepted for characterizing a severe hepatopathy according to MELD is equal or higher than 15.

The hepatocellular carcinoma is considered as a severe condition, and patients presenting this tumor score 20 points more than their own score. Therefore, there is a natural trend to an increase in the number of liver-transplanted patients with hepatocarcinoma, and, consequently, more time in the liver waiting list for the patients with smaller hepatopathy severity (ascites, portal hypertensive gastropathy, cirrhotic hydrothorax, among others). This means that, apparently, patients with hepatic tumors will be the first to be submitted to liver transplant, and that other therapeutic measures will be adopted for management of portal hypertension and resulting complications. In these

cases, TIPS will have a role to play. Because of the organs scarcity in Brazil, there is an initial trend to increase the number of TIPS in patients with portal hypertension.

In this scenario, interventional radiologists should be prepared to evaluate the best moment for indicating and performing this type of intervention. Also, I emphasize that a multidisciplinary integration is essential for the success of the therapy and the patients' survival.

#### REFERENCES

1. Ferral H, Urbina-Anderso IK, Carnevale FC. Shunt portosistêmico intra-hepático transjugular. In: Carnevale FC. Radiologia intervencionista e cirurgia endovascular. 1ª ed. Rio de Janeiro: Livraria e Editora Revinter, 2006.
2. Kamath PS, Wiesner RH, Malinchoc M, et al. A model to predict survival in patients with end-stage liver disease. *Hepatology* 2001; 33:464–470.
3. Merion RM. When is a patient too well and when is a patient too sick for a liver transplant? *Liver Transpl* 2004 Oct;10(10 Suppl 2): S69–S73.