

# Surgical approaches for portal hypertension

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## Q. What are the current indications for non-transplant surgery in portal hypertension (PH)?

The history of surgical treatment of PH goes back to the experimental Eck fistula in dogs in 1877 and studies on encephalopathy by Pavlov in 1883. The first clinical portosystemic shunts (PSS) were performed by Whipple in 1945 and Blakemore in 1950. Warren performed a selective distal splenorenal shunt in order to preserve portal blood flow to the liver in 1967. Starzl, at the end of the 1960s, performed the first successful liver transplant and later this changed the policy of treatment of cirrhotic patients.

Endoscopic sclerotherapy was introduced in 1973 by Johnston and in the early 1980s Lebrec used propranolol for medical treatment of PH. In 1983 Colapinto performed the first transjugular portosystemic shunt (TIPS). These developments changed the treatment of PH: the period spanning from the 1950s –1970s was characterised by surgical treatment, the 1980s by medical and endoscopic treatment, the 1990s featured TIPS and liver transplantation (LTx) as a routine operation with good results. Hence, treatment evolved from derivative surgery, being the only option up to the 1970s, to the wide range of options now available.

The correct algorithm for treatment should be chosen in a multidisciplinary approach involving the surgeon, hepatologist, endoscopist and interventional radiologist considering not only clinical parameters but also the context of available therapies.

For patients with non-cirrhotic PH, in particular for those with extrahepatic portal vein thrombosis (EHPVT), surgical PSS represents the only effective therapy which leads to freedom of recurrent bleeding, repeated endoscopies, close follow-up and improve hypersplenism without deteriorating liver function or encephalopathy.<sup>1</sup>

In EHPVT, TIPS is not possible and especially in these patients, but also in non-cirrhotic PH without portal thrombosis (cystic fibrosis, schistosomiasis, congenital hepatic fibrosis, Nodular regenerative hyperplasia), results of surgical PSS are superior to TIPS for higher patency with no required revision or follow-up.<sup>1-2</sup>

EHPVT is often a childhood disorder leading to PH and its sequelae in the setting of a well-preserved liver function. Natural history of EHPVT is growth retardation, impaired QoL, portal biliopathy and minimal hepatic encephalopathy.

Management in both non-cirrhotic PH and EHPVT is focused primarily on management of an acute episode of variceal bleeding followed by secondary prophylaxis and the management of EHPVT needs to be individualized depending on the age of patient and the site of obstruction. In children with EHPVT a mesoportal bypass is indicated and restores physiological portal flow to the liver through the Rex venous recessus correcting not only PH but also avoiding systemic manifestation; this operation should be considered a preventive strategy and carried out as early as possible when the Rex venous recessus is still patent.<sup>3,2,4,5</sup>

For cirrhotic patients the use of surgical PSS has declined in the era of TIPS because this procedure is relatively easy to perform and less invasive also if many experiences suggest better results of PCS compared with TIPS (patency, encephalopathy, incidence of rebleeding)<sup>6</sup> in Child A/and selected B.<sup>7</sup>

For patients Child A/B MELD < 14 but also in patients with contraindication to TIPS (portal thrombus, right liver atrophy, patients without compliance for follow-up) PSS should be applied. For patients with greater MELD TIPS should be considered in patients on waiting list for LTx or if they are likely to become candidates for LTx in the near future. If LTx is not imminent PSS should be used if chances of Tx or close follow-up of TIPS are unlikely because of socioeconomic issues or lack of ready access to health care. TIPS seems well applied to patients with an unacceptable operative risk, previous upper abdominal operations, severe obesity or cardiopulmonary disease. In these well compensated low- risk patients results of PSS are superior to TIPS.<sup>8, 7, 9, 10</sup>

Emergency surgical PSS is not widely used also if results seem superior to TIPS even when performed after failure of TIPS as a rescue therapy.<sup>11</sup> Also results of emergency and elective treatment of gastric varices seem better compared to endoscopic therapy and TIPS.<sup>12</sup>

When no portomesenteric vein is patent surgical strategy could be the modified Sugiura procedure with splenectomy, esophago gastric devascularization and esophageal transection. Some surgeons, including myself, avoid esophageal transection in order to reduce morbidity related to esophageal leak.<sup>13</sup>

Removing surgical shunts from a surgeon's armamentarium is premature and offers good results for patients with compensated cirrhosis in whom LTx is premature or contraindicated and also in patients with non-cirrhotic PH.

Measures such as unlimited variceal ligation, TIPS and liver Tx are not available in developing countries (which account for more than 50% of the population); in this setting surgical approach is mandatory in selected patients.

## **Q. Will mini- invasive surgical approaches change the landscape of surgery in PH?**

Mini-invasive surgery is entering every field of surgery. The most important issue is a learning curve in order to perform in laparoscopy the same open surgery with lower invasivity. The problem in non-transplant surgery of PH is the reduction in number of indications and so a learning curve is more difficult to be reached.

Recent literature reports laparoscopic esophago gastric devascularization with splenectomy in two high volume Chinese centers with good results; also in 1999 the first laparoscopic portocaval H-graft shunt was reported.<sup>14, 15</sup> In my opinion a mini-invasive surgical approach should be considered only for centers with a large volume of patients otherwise I think that particularly in the case of portosystemic shunts open surgery is safer.

### **Q. Will the role of non-transplant surgery expand in cirrhotics with PH and resolved viral hepatitis?**

Current HCV treatments based on direct-acting-antiviral (DAA) therapy are well tolerated and effective and can cure about 95% of infected patients. This revolutionary therapy is changing the clinical history of the disease and also the spectrum of patients on waiting lists for liver transplant is changing.

We can argue that in the future many of these patients will not progress to liver failure without the need for LTx but some will develop severe portal hypertension. In this setting of patients surgical PSS could be taken into account considering that compared with TIPS it has better patency, has no requirement of close follow-up and the possibility to use selective shunts with advantages for liver function and encephalopathy.

### **Q. Is there still a role for peritoneovenous shunt for the management of refractory ascites?**

Guidelines for treatment of refractory ascites (RA) recommend diuretics, paracentesis and TIPS discouraging surgical peritoneovenous shunts (PVS) due to poor long-term patency, and no survival advantage. PVS could be offered to patients with RA to diuretics with contraindication to TIPS (encephalopathy, technically impossible) frequent large volume paracentesis and frequent hospitalization in order to improve renal function and QoL in selected patients.<sup>16</sup> Further, our experience with PVS in selected cases suggests that this technique can be reconsidered.

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