LETTER TO THE EDITOR

Left renal vein as an option for portal inflow in liver transplant recipients with portal vein thrombosis

doi:10.1111/j.1432-2277.2008.00660.x

We describe a case with a previous decompressive shunt to the left renal vein where left reno-portal anastomosis was utilised during liver transplantation and discuss other options available for recipients with portal vein thrombosis.

At one time considered a contra-indication to liver transplantation, a variety of approaches ranging from thrombectomy of the obstructed vein to porto-caval transposition have been described to allow such patients to receive liver grafts [1].

Here, we describe a case where a patient with a blocked portal vein (PV), and liver disease requiring liver transplantation, developed intractable variceal haemorrhage managed by shunting to the left renal vein using a large IMV. This allowed subsequent transplantation where the recipient left renal vein was anastomosed end-to-end with the donor PV to provide portal inflow.

A 48-year-old Caucasian woman with end-stage liver failure secondary to alcoholic liver disease presented to the liver transplant unit at Addenbrooke's Hospital, Cambridge with massive upper gastrointestinal haemorrhage from oesophageal and gastric varices. Further investigations revealed extra hepatic PV obstruction. Initial banding of varices and a subsequent attempted transjugular intrahepatic porto systemic shunt (TIPSS) were unsuccessful. She therefore underwent a laparotomy at which a very large inferior mesenteric vein (IMV) with a diameter of approximately 1.5 cm was anastomosed end-to-side to the left renal vein after ligating the distal IMV, as a non-selective central shunt. She made a good recovery from this procedure and 5 months later underwent an orthotopic liver transplant (OLT). At the time of OLT, the recipient PV was found to be solidly thrombosed and occluded but the inferior mesenteric-left renal vein shunt was clearly patent and had excellent flow on intra-operative ultrasound. The patient was placed on veno-venous bypass using a BioMedicus pump (Medtronic Inc, Minneapolis, MN, USA) and heparin bonded circuit using only a single femoral cannula for the outflow (the portal system being decompressed through the previous shunt) and return via percutaneous cannulae in the neck. A classical OLT with vena caval replacement was then performed. The duodenum and head of pancreas were mobilised and the recipient left renal vein was disconnected from its junction with the inferior vena cava (Fig. 1) and was anastomosed end to end with the donor PV using continuous 5.0 prolene (Fig. 2). The vessels lie comfortably in

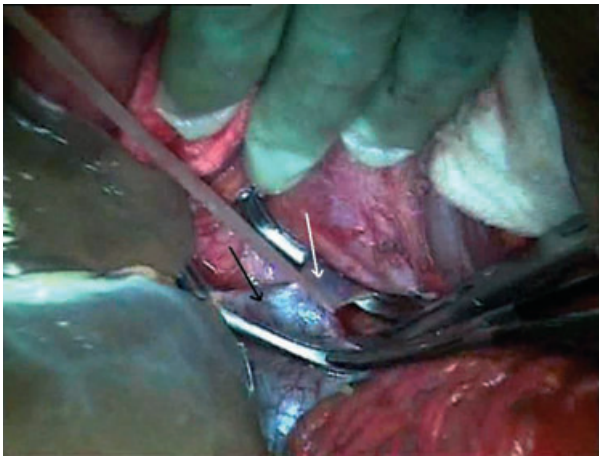

Figure 1 The junction of left renal vein (white arrow) to the inferior vena cava (black arrow) controlled with clamps.

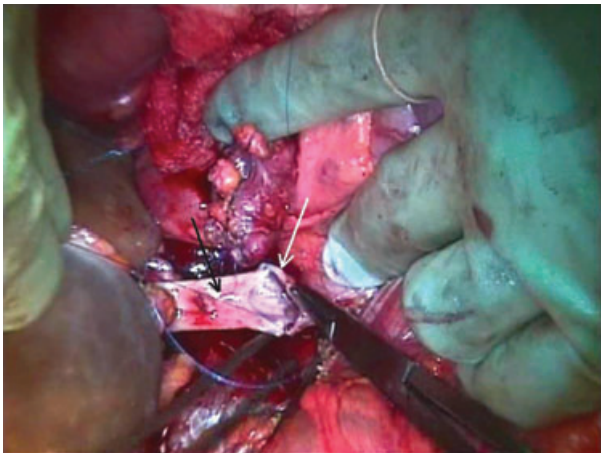

Figure 2 An end-to-end left renal vein (white arrow) to donor portal vein (black arrow) anastomosis in progress.

this position without any compression from the head of pancreas and no extension to the donor liver PV was required. The operation was completed by performing a conventional arterial and biliary anastomosis. Her post operative course was uneventful; a Doppler ultrasound scan confirmed a patent reconstructed PV with hepatopetal flow. She was discharged 3 weeks following OLT and remains well on follow up at 1 year with normal liver and renal function tests.

Surgical shunts for variceal bleeding in patients who may be candidates for liver transplantation are avoided wherever possible as they potentially increase the morbidity and mortality of subsequent transplant procedures. Despite the enormous success of the TIPSS procedure in avoiding the need for an open surgical procedure, surgical porto systemic shunts continue to have a small but important role in the management of massive upper gastrointestinal haemorrhage secondary to portal hypertension, particularly in cases such as this where a thrombosed PV can preclude successful TIPSS placement. These will prevent satisfactory portal inflow to the graft at the time of transplantation unless they are dismantled (end to side porto-caval shunts) or ligated (mesocaval shunts, porto-caval 'H' grafts, or conventional splenorenal shunts). Dismantling a previously constructed shunt increases the complexity of the procedure and carries an additional risk of bleeding [2,3]. Kato *et al.* have reported that anastomosis of the donor PV to the left renal vein without dismantling the shunt is an effective method of PV reconstruction for patients with a patent distal spleno-renal shunt [4,5]. In this case, a large IMV to left renal vein anastomosis was deliberately chosen as a central portal decompressive shunt in a patient thought to be an appropriate candidate for subsequent liver transplantation with the intention of using this approach to graft inflow in the subsequent transplant procedure with total mesenteric flow diverted via this route.

More conventional options available for patients with an obstructed PV while performing OLT include PV thrombectomy and anastomoses [6], excision of the thrombosed segment with anastomosis at the junction of splenic and PV confluence [7] or a jump graft from recipient superior mesenteric vein to donor PV using donor iliac vein [8–10]. In cases with extensive mesenteric occlusion anastomosis to a large venous collateral may be possible [8]. In patients who are found to have extensive portal, splenic and superior mesenteric thrombosis, porto-caval hemi transposition [11–13] offers an alternative, providing the liver graft with inflow from the inferior vena cava but obviously does not address the mechanical issue of mesenteric venous drainage and the risk of 'portal hypertensive' gastro-intestinal bleeding. However, in patients known to have such extensive portal system thrombosis, a multi visceral transplant [14] does offer another option replacing the occluded mesenteric system with a patent donor system.

Portal vein thrombosis is no longer considered to be an absolute contraindication to liver transplantation. Anastomosis of the left renal vein to the donor PV is an effective method of obtaining portal inflow in patients with extensive portal thrombosis found at laparotomy. The choice in this case of a central decompressive shunt to the left renal vein at the time of the variceal haemorrhage allowed use of the left renal vein to give full portal inflow to the grafted liver without the additional operative risk and complexity of dismantling the shunt.

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