Initial Experience With Right Lobe Living Donor Liver Transplantation


The feasibility of right lobe living donor liver transplantation (LDLT) has been demonstrated and its practice is gaining popularity. Although the supply of organs is not enough the world over, LDLT is probably more warranted in societies where cadaveric donation is severely restricted. Such is the situation in Taiwan with only 0.5 liver grafts available per million population per year (data from the Organ Donation Association, Taiwan). Whereas the left lateral segment is usually enough for pediatric recipients, a bigger graft would be required for larger pediatric or adult candidates to provide adequate functional mass. The Liver Transplant Program of the Chang Gung Memorial Hospital caters to both adult and pediatric recipients and its living donor program, which began in 1994, has thus far been limited to left lobe allografting. This report aims to describe an initial experience with right lobe LDLT in this institution, which is also the first of its kind in Taiwan.

The recipient was a 17-year-old male weighing 63 kg with end-stage liver cirrhosis secondary to Wilson’s disease who suffered frequent variceal bleeding. The donor was his 42-year-old father weighing 56 kg who was blood group identical. With the size discrepancy between father and son, a right lobe graft was the better option to provide a graft-recipient weight ratio of at least 1%. Preoperative imaging studies revealed complicated right lobe hepatic venous anatomy in the donor with two right hepatic veins (RHV), two middle hepatic veins (MHV), and two right inferior hepatic veins (RIHV). There were likewise two right hepatic ducts, one of them a right posterior segment duct draining into the left hepatic duct. An extended right lobectomy including the MHV was performed in the father and the operation lasted for 12 hours with a blood loss of 110 mL. The procedure was well tolerated and the donor was discharged on the seventh postoperative day without any complications.

The graft weighed 798 g and the graft-recipient ratio was 1.3%. Graft implantation was done with preservation of the inferior vena cava (IVC) without crossclamping. Venoplastics of the two RHVs and two MHVs in the graft to create a single outflow orifice for each main hepatic vein was performed and anastomosed to the recipient RHV and common trunk of MHV and left hepatic vein (LHV), respectively. The smaller (3 mm) of the two RIHVs was ligated and the larger one (5 mm) was anastomosed to a separate venotomy on the IVC. Right-to-right portal vein and hepatic artery anastomoses were made. The two bile ducts were close to each other and anastomosed as one Roux-en-Y hepatocholedojunostomy.

Graft function was good although massive ascites of up to 2 L/d persisted. The recipient had recurrent variceal bleeding 1 week posttransplant, which was successfully managed by band ligation. Biopsy-proven acute cellular rejection was diagnosed on the 19th day posttransplant and was effectively treated with three boluses of intravenous steroids. He was on cyclosporine-based triple drug immunosuppression.

Hepatic outflow obstruction was suspected and suggested by Doppler ultrasound which revealed poorly detectable hepatic veins with velocities of 11 to 16 cm/sec and flat to borderline biphasic waveforms. The portal vein and hepatic artery exhibited good flow. Computed tomography showed congestion of segment 7 of the liver while longitudinal magnetic resonance imaging showed narrowing of the MHV anastomosis. Percutaneous venography with pressure studies demonstrated significant gradients across the RHV and MHV compatible with outflow obstruction. The RHV stricture was dilated by balloon angioplasty while the MHV stenosis was not corrected by dilatation alone. The narrowing was believed to be due to torsion and was corrected by deployment of a Wallstent metallic prosthesis (12 × 50 mm, Wallstent, Schneider, Switzerland). Pressure gradients dropped from 17 to 14 cmH2O and from 34 to 12 cmH2O in the RHV and MHV, respectively. Doppler ultrasound demonstrated a marked increase in flow velocities and a change from monophasic to biphasic waveforms in the hepatic veins after the interventional procedures.

The ascites gradually decrease after venoangioplasty of the RHV and stenting of the MHV and the patient’s overall condition improved until discharge 1 month after the procedure. At 8 months posttransplant the patient continues to do well with normal liver function. The latest CT
showed no ascites and resolution of liver congestion while Doppler US showed good flow in the hepatic veins.

In the face of the serious donor shortage, complicated venous anatomy in prospective liver grafts need not preclude donation, although careful attention must be paid to surgical technique to avoid complications. The proper orientation of graft and recipient veins must be assured especially when individual clamping of the recipient vessels instead of IVC crossclamping is opted for during anastomosis. Interventional procedures can be both diagnostic and therapeutic in post-LDLT Budd-Chiari syndrome.

REFERENCES