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Extra-anatomic venous graft for portal vein thrombosis in liver transplantation

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Sir: We read with interest the article by J.P. Lerut et al. about liver transplantation (OLT) and portal vein anomalies [2]. This paper analyzes a very large (53 patients), but quite heterogeneous, group of patients. Preoperative portal vein thrombosis (PVT), phlebitis, and previous surgery for portal hypertension are difficult situations in OLT, and it is our opinion that the surgical management is not the same for all of them.

With regard to PVT, it can be concluded from Lerut et al.'s study that blind or, more recently, eversion portal venous thrombectomy is the preferred surgical technique in 26 out of 32 cases (81%). Mortality after this procedure was high (4/26; 15%), and severe intra- and postoperative bleeding were frequent complications (7/26; 27%). Portal vein rethrombosis is another complication that has been frequently reported after this procedure [3, 5]. Their experience with splenomesenteric confluence dissection is even worse, with 80% mortality (4/5).

Superior mesenteric vein (SMV) implantation was used in only nine cases (18%) treated by Lerut and colleagues [2]. In contrast, our first option in the management of chronic, complete PVT is the use of the

SMV implantation with an iliac graft. Between July 1993 and January 1996, 119 primary OLTs were performed in our unit. In the preoperative assessment before OLT, an echo-Doppler study was systematically performed. Subsequently, angiography was only done in patients presenting pathological ultrasonography. Partial PVT was diagnosed preoperatively or intraoperatively in four patients, and another ten patients were found to have complete, chronic PVT. We considered PVT to be chronic and complete if, intraoperatively, the chronic thrombus occluded over 90% of the portal lumen.

Thrombectomy was chosen as the main management strategy for the four patients with partial PVT, and their postoperative course was uneventful. All ten patients with chronic, complete PVT underwent OLT due to postnecrotic cirrhosis. In one patient, an intrahepatic cholangiocellular carcinoma was incidentally discovered. Two patients had a previous history of surgical procedures for portal hypertension: one Sugiura's operation with splenectomy and an esophageal transection performed 5 and 6 years, respectively, before transplantation.

All of the patients with chronic, complete PVT underwent portal vein reconstruction with placement of an extra-anatomic mesoportal venous jump graft, using the technique described by Burdick et al. and Sheil et al. [1, 4]. Liver harvesting included systematic removal of the infrarenal vena cava and the common and external iliac veins. When performing an extra-anatomic venous jump graft, the proximal end of the iliac vein conduit was anastomosed to the portal vein or SMV of the donor on the back table. In the recipient, after completion of the vena cava anastomosis, the vein graft was placed anterior to the pancreas and behind the stomach; it was then anastomosed end-to-side to the

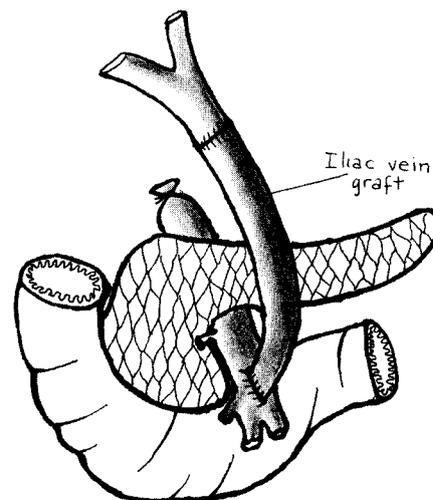


Fig. 1 The proximal end of the iliac vein conduit is anastomosed to the portal vein of the donor on the back table. After completion of the vena cava anastomosis, the iliac vein graft is placed anterior to the pancreas and behind the stomach; it is then anastomosed end-to-side to the recipient's infra-mesocolic SMV

recipient's infra-mesocolic SMV (Fig. 1).

In patients with chronic, complete PVT, intraoperative portography through a jejunal vein was performed before and after the implantation in order to study the degree of PVT and the presence of hepatofugal flow. When a recent arteriography was available, this procedure was not performed. If a significant hepatofugal flow was detected, the most evident and accessible collaterals were ligated. After OLT, treatment with low molecular weight heparin (40 mg) was carried out for 3 months.

Operative data, blood transfusion requirements, and postoperative course in ten patients with chronic, complete PVT were analyzed. Subsequently, the results were compared with a group of 109 patients without chronic, complete PVT who underwent primary OLT during the same period.

The preoperative echo-Doppler study identified PVT in only four of

the ten patients with chronic, complete PVT, and angiography confirmed the sonographic findings in all cases. OLT was performed with vena cava preservation in most of the cases (piggy-back technique). The intraoperative portography showed the presence of significant hepatofugal shunts in four of the ten patients. Their presence led to ligation of the most evident and significant collaterals: left gastric vein in two cases, splenic vein and splenectomy in one, and ligation of the left renal vein in the last case. After this procedure, postoperative portography showed an increase in portal blood flow in these patients.

The two groups were comparable in terms of age, sex, diagnosis, Child Pugh score, previous abdominal surgery, and cold ischemia time. Operative time (558 ± 94 min vs 460 ± 107 min; $P = 0.006$) and duration of the anhepatic phase (95 ± 34 min vs 68 ± 22 min; $P = 0.01$) were significantly longer in patients with chronic, complete PVT than in those without. Nevertheless, no significant differences in blood transfusion requirements, reoperation rate, infection rate, days on mechanical ventilation, ICU stay, or hospitalization were observed. Two of the ten patients with chronic, complete PVT underwent retransplantation due to an early hepatic artery thrombosis during the 1st week and a chronic rejection after 3 months. The venous graft was patent at the time of re-OLT in both cases, and was success-

fully reused. One patient (10%) presented an early (36 h post re-OLT) venous graft thrombosis due to a compressive hematoma in the conduit route. Reoperation, surgical thrombectomy, and reanastomosis were performed with good results. No other surgical complications were reported in this group.

The operative and 30-day mortality rate in patients with chronic, complete PVT was 0%. One patient died during the follow-up due to a *Pneumocystis carinii* pneumonia and multiorgan failure 3 months after a second transplantation due to chronic rejection. Postmortem examination showed portal vein patency.

The median follow-up period was 10 months (range 0–30 months). During this time, the liver function of the nine survivors was good and the patency of the portal vein was periodically documented using echo-Doppler. The 12-month actuarial survival rate in the chronic, complete PVT group was 78% for the liver grafts and 87% for the patients, whereas in the control group it was 78% and 84%, respectively. Survival curves based on the log rank test showed no significant differences for either patients or liver grafts.

In contrast with the study of Lerut et al. [2], mortality and morbidity after OLT in patients with chronic, complete PVT using the above-mentioned technique is the same as in the patients without PVT.

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