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Case report

Liver transplantation in a patient with complete portal vein thrombosis, is there a surgical way out? A case report

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HIGHLIGHTS

- The Yerdel III–IV portal vein thrombosis should not be considered an absolute controindication to liver transplantation
- The identification of a well represented spleno-renal shunt on the pre-operative imaging is essential to plan a liver transplantation
- Since the high risk surgery a transplant benefit must be evaluated in order to estimate the gain in terms of survival
- The operation must be lead by a high experienced liver transplant surgeon

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ABSTRACT

Introduction: Due to the complexity of the surgical procedure portal vein thrombosis (PVT) has long been considered an absolute contraindication to liver transplantation (LT). The presence of a large splenorenal shunt (SRS) could make portal anastomosis a valid option.

Presentation of case: We report the case of a 37-year-old female patient with Grade III PVT and a large SRS, who underwent orthotopic LT. Liver was implanted using a 1992-Belghiti piggyback technique and portal anastomosis was performed using the large spleno-renal shunt. We observed good graft reperfusion and postoperative Doppler ultrasound showed normal portal vein flow. She was discharged on postoperative day 7, with an excellent graft function. At six months follow-up, patient is alive with normal hepatic vascularization.

Discussion: Due to paucity of reports, there is currently no consensus on the indication to LT and/or surgical technique. In the present case, once the transplant benefit was evaluated, the Grade III PVT was not considered a contraindication to LT.

Conclusion: The presence of a Grade III PVT associated with a large SRS should not be considered a contraindication for LT, and the use of the shunt vein should be considered a feasible option to perform portal anastomosis.

1. Introduction

Portal vein thrombosis (PVT) is a complication of chronic liver disease. It is typically associated with portal vein hypertension and porta-cava shunts, with the formation of venous collaterals that bypass the narrowed or occluded portal vein, forming 'surrounding portal vein cavernoma' or spontaneous *real anatomical* porto-systemic shunts. Of these shunts, the most common, with a prevalence of 20–35% in liver transplantation (LT) candidates [1] is the splenorenal shunt (SRS).

Although PVT has long been considered an absolute contraindication to LT, it is currently regarded as a relative contraindication, depending on the type of PVT, patient clinical status, and obviously, the surgeon's experience. In the year 2000, the Birmingham Group graded PVT according to operative findings, as shown in Table 1 [2]. If, on the one hand, the natural SRS protects from variceal development by avoiding fatal bleeding, on the other, it complicates

Abbreviations: PVT, portal vein thrombosis; LT, liver transplantation; SRS, spleno-renal shunt; CT, computed tomography scan; ICU, Intensive Care Unit; LRV, left renal vein.

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Table 1
Birmingham Group Classification of Portal Vein Trombosis findings during liver transplant procedure [2].

Yerdel grade	Description
I	Minimally or partially thrombosed PV, in which the thrombus is mild or, at the most, confined to 50% of the vessel lumen with or without minimal extension into the SMV
II	>50% occlusion of the PV, including total occlusions, with or without minimal extension into the SMV
III	Complete thrombosis of both PV and proximal SMV. Distal SMV is open.
IV	Complete thrombosis of the PV and proximal as well as distal SMV

SMV: superior mesenteric vein; PV: portal vein.

surgery because of the difficulties of retroperitoneal dissection and preparation of the shunt.

We report the case of a young patient with pre-operative *Grade III* PVT, associated with SRS, who subsequently underwent LT for autoimmune cirrhosis. The present case is in line with the CARE criteria [3]. We searched for published studies that described LT in recipients with preoperative PVT Grade III or IV in PubMed (http://www.ncbi.nlm.nih.gov/pubmed).

2. Presentation of case

A 37-year-old female patient with autoimmune hepatitis/primary biliary cirrhosis overlap syndrome underwent deceased-donor LT. Pre-operative computed tomography (CT) scan showed extensive thrombosis of the portal vein extending to the origin of the SMV [*Yerdel Grade 3* (2)], with severe porto-systemic collateral veins, including a SRS > 1 cm in diameter (Fig. 1). At the time of LT, the Model End-Stage Liver Disease score was 24 and the Mayo Risk Score was 9.0.

After right subcostal incision, we accessed the omentum retrocavity in order to expose the large SRS and verify the usability of the vein so as to safely perform a portal venous shunt anastomosis. Since a calcific portal vein sclerosis extending into the proximal superior mesenteric vein was confirmed, portal trombectomy was ruled out; hence the proximal (splenic side) and distal (renal side) SRS were prepared circumferentially and the small vessels arising from the shunt ligated (Fig. 2). We performed the transplant procedure using a 1992-Belghiti piggyback technique [4]. The SRS was sectioned at the confluence to the left renal vein after side to side vena cava anastomosis and the renal side was brought behind the stomach (Fig. 3); A running suture, with a 5/0 prolene stitch, was used to perform a T-T anastomosis between portal vein and venous-shunt (Fig. 4). We observed good graft reperfusion without surgical or medical problems. The intraoperative Doppler ultrasound

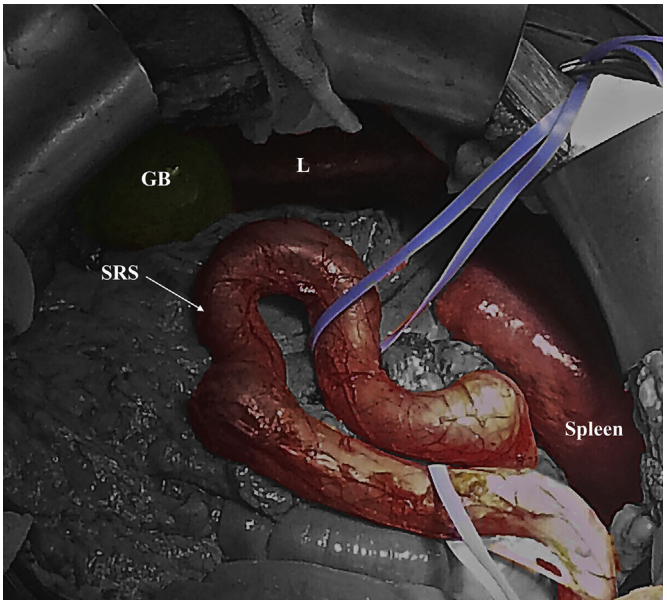

Fig. 2. Spleno-renal shunt after surgeon dissection. On the blue vessel loop the splenic and renal side of the shunt SRS: spleno-renal shunt; GB: Gallbladder; L: Liver.

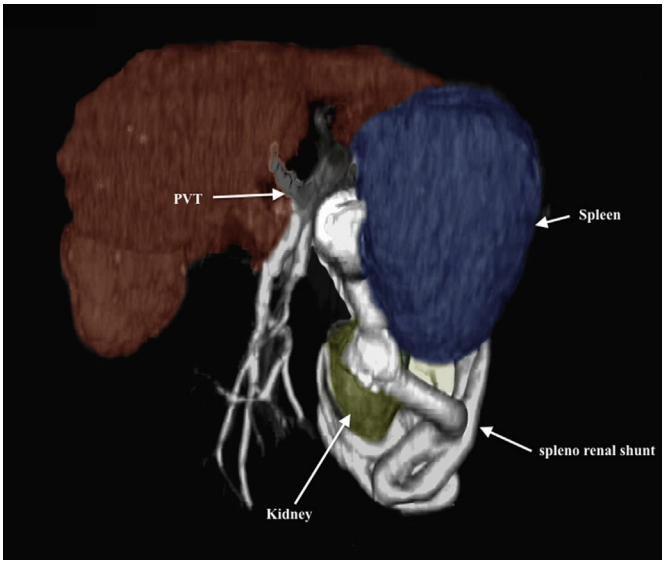

Fig. 1. Preoperative Radiological Imaging 3D. In white, the massive and tortuous shunt arising from splenic and reaches left renal vein. PVT: portal vein trombosis.

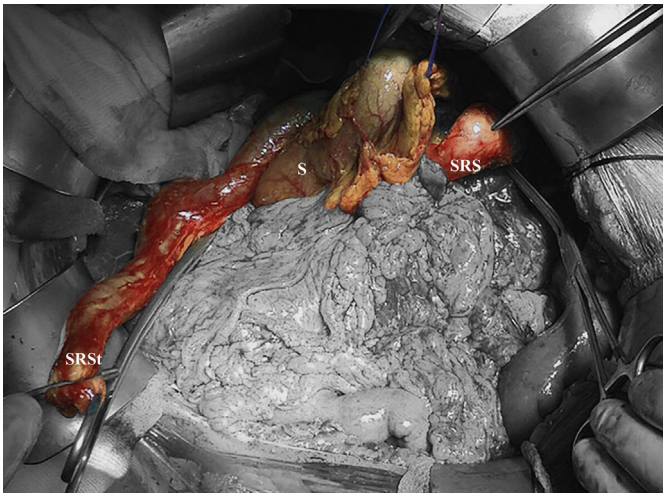

Fig. 3. The "spleno-renal shunt stump". The shunt sectioned at the confluence of left renal vein was brought behind to the stomach to safely perform portal anastomosis. S: Stomach; SRSt: Spleno renal stump; SRS: spleno-renal shunt.