

Living-Donor Liver Transplantation for Budd-Chiari Syndrome—Resection and Reconstruction of the Suprahepatic Inferior Vena Cava With the Use of Cadaveric Aortic Allograft: Case Report

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ABSTRACT

Background. Living-donor liver transplantation with inferior vena cava resection and reconstruction is rarely indicated for Budd-Chiari syndrome. The aim of this case presentation was to present and discuss the inferior vena cava reconstruction with the use of cadaveric aortic allograft after resection of the suprahepatic inferior vena cava in a patient with Budd-Chiari syndrome who was treated with living-donor liver transplantation.

Case Report. A 29-year-old male patient with end-stage liver disease and suprahepatic inferior vena cava obstruction was referred to our center. He was scheduled for living-donor liver transplantation. The suprahepatic inferior vena cava was resected and reconstruction was achieved by means of interposition of the cadaveric aortic allograft between the right atrium and inferior vena cava. Postoperative course was uneventful.

Discussion. Liver transplantation and vena cava reconstruction is indicated in some patients with end-stage liver disease and Budd-Chiari syndrome. Limitations in cadaveric organ donation may be compensated for with the use of living-donor liver. In this condition, various aspects of inferior vena cava reconstruction may be discussed.

Conclusions. Budd-Chiari syndrome due to suprahepatic inferior vena cava obstruction close to the right atrium may be treated with vascular reconstruction with the use of a cadaveric aortic allograft.

BUDD-CHIARI syndrome is defined as the obstruction of the hepatic veins and/or inferior vena cava and may lead to hepatic congestion, end-stage liver disease, or portal hypertension. Transjugular portosystemic shunt (TIPS) or surgical shunt procedures may successfully preserve liver functions in selected patients [1]. However, end-stage liver disease may require liver transplantation. Complete obstruction of inferior vena cava may require resection of the obstructed segment of the inferior vena cava. Deceased-donor liver transplantation has an advantage in this condition to achieve vascular continuity of the inferior vena cava [2]. However, living-donor liver transplantation is intended or indicated owing to lack of cadaveric liver graft and the existence of various reconstruction techniques with various vascular grafts to achieve vascular continuity of the inferior vena cava and to supply hepatic venous outflow [3].

The aim of the present case presentation is to present and discuss the inferior vena cava reconstruction with the use of aortic graft after resection of the suprahepatic inferior vena

cava in a patient with Budd-Chiari syndrome who was treated with the use of living-donor liver transplantation.

CASE REPORT

A 29-year-old male patient with end-stage liver disease was referred to our institution. Inferior vena cava obstruction was documented with radiology before referral. Physical examination revealed ascites and edema in lower extremities. Laboratory tests showed: hemoglobin level, 14.5 g/dL; platelet count, 102,000/mm³; albumin level, 4 g/dL; international normalized ratio, 4.4; and liver enzymes in normal ranges. Child-Pugh score and MELD score were 8 and 23, respectively. Computerized tomography showed an obstruction of the inferior vena cava at the suprahepatic level (Fig 1). Living-donor liver transplantation with inferior vena cava allograft reconstruction was planned.

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Fig 1. A complete obstruction of the suprahepatic inferior vena cava is observed in contrast-enhanced computerized tomography.

During the procedure, extensive collateral circulation and 3 L of ascites were observed in the peritoneal cavity. The inferior vena cava was dissected and clamped from the proximal to distal edge of the obstructed segment and resected en bloc with the liver. After the resection, reconstruction was completed with the use of a cadaveric aortic allograft (Figs 2–4). After implantation of the living-donated liver graft, the surgical procedures were completed. Recipient total hepatectomy was performed without any blood product transfusion. Operation time was 480 minutes and total ischemia time was 300 minutes. Postoperative course of the patient was uneventful without any complication. The graft was observed to be patent at the 1st postoperative month (Fig 5). At the time of writing, the patient is on postoperative 4th month with no complication.

DISCUSSION

Liver transplantation and vena cava reconstruction is indicated in some patients with end-stage liver disease and Budd-Chiari syndrome. Limitations in cadaveric organ donation

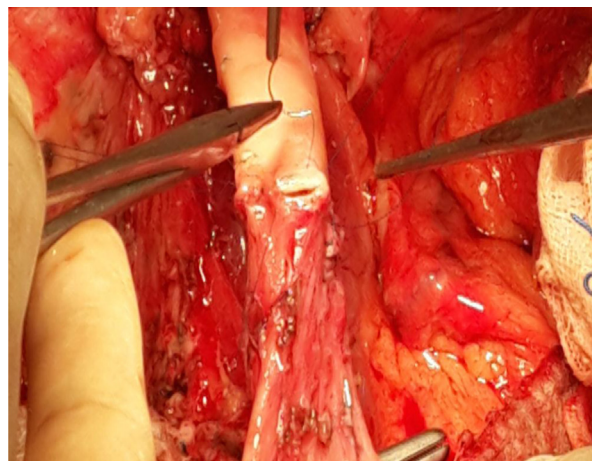


Fig 3. Proximal anastomosis between native infrahepatic vena cava and aortic graft for inferior vena cava reconstruction.

may be compensated for with the use of living-donor liver. In the present case the liver graft was donated by a living donor. Previously, living-donor liver transplantation for end-stage liver disease and Budd-Chiari syndrome was reported to be effective [4]. It is clear that cadaveric liver grafts have an advantage to decrease or to minimize the need of vena cava reconstruction in those patients with Budd-Chiari syndrome due to vena cava obstructions. However, in living-donor liver transplantation the liver graft does not have its own vena cava and requires various vascular reconstruction procedures with grafts. Various caval reconstruction techniques performed with artificial or allogeneic vascular grafts have been reported [5–8].

Extensive collateral circulation may cause excessive intraoperative bleeding during hepatectomy in patients with Budd-Chiari syndrome. If preoperative evaluation reveals complete obstruction of the inferior vena cava, we prefer en bloc resection with liver to decrease intraoperative bleeding. Then we

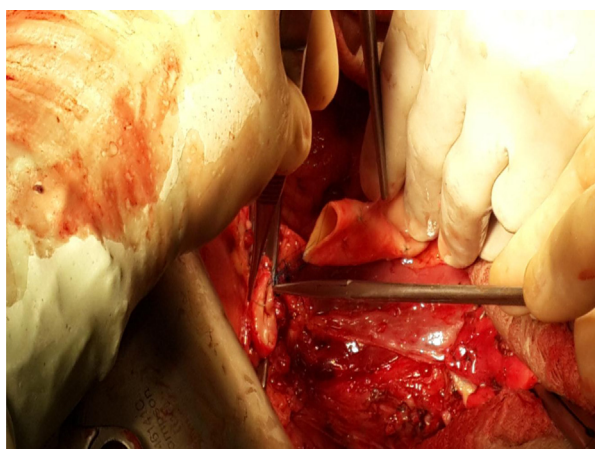


Fig 2. Proximal anastomosis between right atrium and aortic graft for inferior vena cava reconstruction.

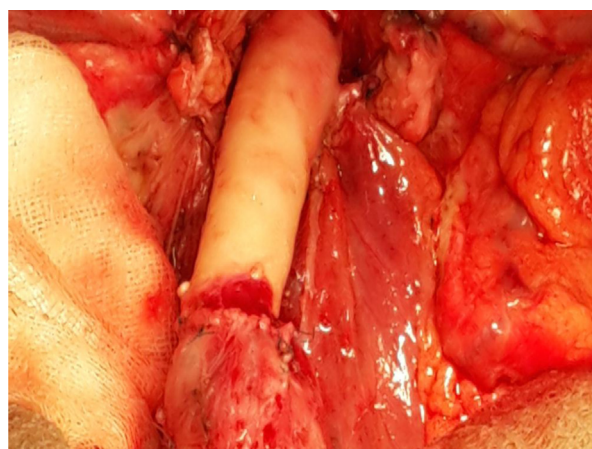


Fig 4. The completed inferior vena cava reconstruction with aortic graft.



Fig 5. Postoperative computerized tomography of graft.

reconstruct the vena cava with the use of cadaveric aortic graft. Implantation of the liver allograft after reconstruction of the inferior vena cava can be performed easily with the use of this technique. We previously reported our experience with liver

transplantation and vena cava reconstruction in those patients with Budd-Chiari syndrome and *Echinococcus alveolaris* [3,4,8].

In conclusion, Budd-Chiari syndrome due to suprahepatic inferior vena cava obstruction close to the right atrium may be treated with vascular reconstruction with the use of an aortic allograft. Implantation of the living donor liver allograft after reconstruction of the inferior vena cava can be performed safely.

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