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Temporary Portocaval Shunt by Piggyback Cava in Liver Re-Transplantation: Report of a Case

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Authors' contributions

There were equal contributions by all the authors to this manuscript. All the authors read and approved the final manuscript.

Case Study

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ABSTRACT

Re-transplantation operation is a technically difficult procedure because of many adhesions; it has higher morbidity and mortality. In this article a maneuver facilitating liver re-transplantation is described. 27-year old male with hepatic artery thrombosis three months after the deceased liver transplantation admitted to our clinic for re-transplantation. Related living right lobe liver transplantation was planned. During recipient's hepatectomy, the hepatic hilum was transected first, but retroperitoneal dissection and identification of the patient's vena cava was very difficult. Prolonged operative time and risk of mesenteric venous hypertension after the clamping of portal vein required an application of temporary porto-caval bypass. For this shunt the portal vein of recipient and lower end of cadaveric liver vena cava ("piggyback vena cava") were used. Vena cava of patient was not clamped during the bypass application, so blood flow in patient's inferior vena cava was not deteriorated. The liver was removed with both caval veins (cadaveric liver vein and recipient's own vein) remained in patient's body. Living donor graft was connected to the piggyback vena cava. Temporary shunt was divided and portal vein anastomosed to the graft portal vein. Arterial anastomosis was performed with recipient's gastroepiploic artery and the biliary reconstruction fashioned by Roux-en-Y hepaticojejunostomy. So, piggyback vena cava can be used

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successfully and safely for temporary porto-caval shunt during the liver re-transplantation.

Keywords: liver transplantation; porto-caval shunt; re-transplantation; surgical technique.

1. INTRODUCTION

Liver transplantation is a life-saving procedure for patients with end-stage liver diseases. 5 and 10 year survival rate after liver transplantation is over 70% and 65% respectively [1]. However, many patients (10.0–19.4%) develop a graft problem after the transplantation [1-4]. In severe cases the only possible treatment modality is a re-transplantation, which rate according to literature varies from 5% to 22% [5-7]. Re-transplantation operation is a technically difficult procedure because of many adhesions; it has higher morbidity and mortality in comparison with first transplantation. In this article we describe one of maneuvers facilitating liver re-transplantation.

2. CASE REPORT

27 year old male admitted to our intensive care unit because of liver failure. Patient underwent a deceased liver transplantation because of cryptogenic cirrhosis in another hospital 3 months prior to admission. In the postoperative period a thrombosis of hepatic artery developed and was not controlled, resulting in liver damage demanding a re-transplantation. Patient's weight was 65 kg and body mass index 22.5 kg/m². Patient had ascites. Laboratory analyses: INR: 1.3, creatinine: 0.68 mg/dL, total bilirubin: 1.25 mg/dL, albumin: 2.1 g/dL, sodium:134 mmol/L, platelet count 48000 /ML.

Living donor for re-transplantation was a twin brother of the patient (74 kg weight, body mass index 25.9 kg/m²). His liver was appropriate regarding the volume, hepatosteatosis, vascular and biliary anatomy, and blood group type. 825 gram right lobe liver graft including middle hepatic vein was removed from the donor. Right and middle hepatic veins were connected into a common trunk by approximating sutures.

Laparotomy in recipient was carried out over the scar of previous operation. About 1 liter of ascitic fluid was aspirated. There were wide and dense adhesions around the liver and between the liver and surrounding organs. There were multiple large biliomas and abscesses in liver as a result of arterial occlusion. Dissection and identification of anatomic structures was very difficult because of adhesions. The occluded hepatic artery and sclerotic common bile duct were transected in the hepatic hilum. During the dissection of portal vein it was injured very close to mesenterico-splenic bifurcation at the level of upper edge of pancreas. The defect of portal vein was recovered by a venous graft. The dissection of liver from inferior vena cava was accompanied by intensive bleeding because of dense adhesions on both sides of the vein. In order to prevent the damage of big vessels and massive blood loss we decided to mobilize the liver by a "piggy-back" technique from liver's vena cava part instead of patient's own vena cava. As there could be some complications on the bowel side because of stop of portal circulation a temporary porto-caval bypass was applied. For porto-caval shunt we used the extended portal vein and the lower end of the second (cadaveric liver) vena cava (Fig. 1). Anastomosis was applied without clamping of patient's vena cava, so blood flow from lower part of the body and kidneys was not deteriorated. The liver was removed without its vena cava, remaining cadaveric vena cava part in patient's body. Living donor liver graft was implanted into this vena cava. Then

temporary porto-caval bypass was divided and extended portal vein connected to the graft's portal vein. Arterial anastomosis was performed with recipient's gastroepiploic artery and the biliary reconstruction fashioned by Roux-en-Y hepaticojejunostomy.

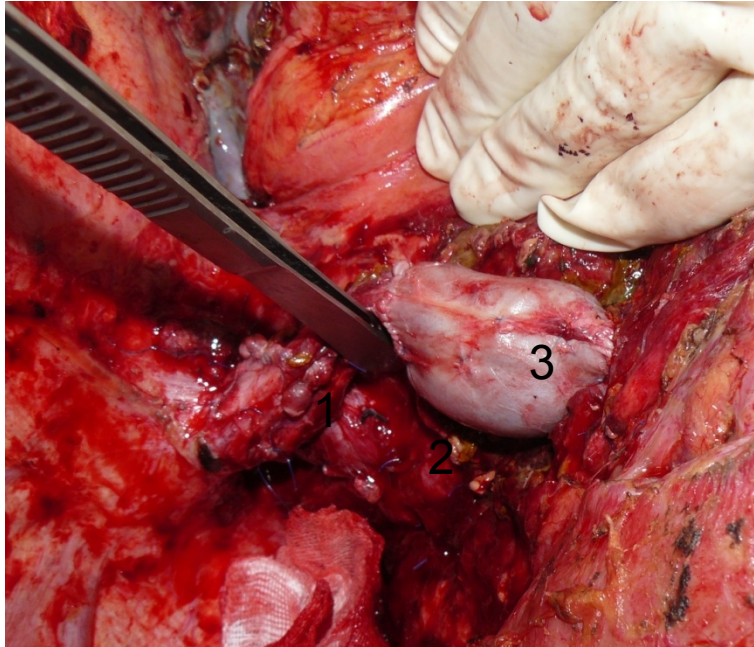


Fig. 1. Performed porto – caval shunt between extended portal vein and lower pole of second vena cava. (1 – second vena cava, 2 – recipients own vena cava, 3 – extended portal vein)

3. DISCUSSION

Generally the results of re-transplantations are worse than primary transplantations: long term survival is 10% to 30% shorter [7], morbidity and mortality rates are higher. The most common causes of mortality after re-transplantation are technical complications. Some authors show that coma, blood hemoglobin level, amount of plasma transfused during the surgery are independent predictors of survival after re-transplantation [5].

During transplantation or re-transplantation the damaged liver has to be removed. It is usually accompanied by significant bleeding, sometimes massive because of portal system hypertension, blood coagulation disorders, and many adhesions after the first transplantation. Peri-operative blood loss is one of the causes of mortality related to liver transplantation [8]. According to literature, the big amount of blood transfused to patients with liver transplantation is associated with increased short-term morbidity like infection [9], re-operations [10], and reduced long-term survival [11-15].

The technique described above has some advantages in comparison with classic technique. First of all, we avoided massive bleeding that could have happened during the dissection of adhesions around recipient's vena cava. Second, the inferior vena cava of recipient was not clamped, thus preventing a cardio-vascular instability and problems with renal blood flow.

Third, easy-to-perform temporary porto-caval shunt prevented a mesenteric edema during the operation.

4. CONCLUSION

We thinking that this surgical technique has some advantages in comparison with classic technique and gave us a chance to avoid massive bleeding and cardio – vascular instability.

CONSENT

All authors declare that 'written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that this study approved by the appropriate ethics committee of Inonu University, Malatya, Turkey and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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