Living-Donor Liver Transplantation with Renoportal Anastomosis using an Interposition Polytetrafluoroethylene Graft for a Patient with Large Spontaneous Splenorenal Shunt: A Case Report

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INTRODUCTION

Adequate portal inflow is an essential component in the liver transplantation. Not a few patients suffering from the end-stage liver disease have portal hypertension accompanied by collateral circulation that bypasses the portal inflow. Among these, splenorenal collateral is one of the common spontaneous portosystemic connections. Although most of these patients are successfully transplanted with conventional surgical procedure, patients who have portal vein thrombosis or poor portal inflow require an additional reconstruction technique. Direct approach to the collateral circulation for diversion of portal flow to the graft in the liver transplantation in patient with portal hypertension is extremely challenging for the patient because of bleeding, and usually it is not successful in the restoration of adequate portal circulation. Concomitant splenectomy would increase the risk of infection and portal vein thrombosis after liver transplantation. (1) Miyamoto et al. reported that the renoportal anastomosis using recipient internal jugular vein graft in the living donor liver transplantation is an effective method of portal vein reconstruction in a patient with large spontaneous splenorenal collateral. (2)

Herein, we describe a successful end-to-end renoportal anastomosis to maintain adequate portal inflow in living-donor liver transplantation using an interposition polytetrafluoroethylene (PTFE) (W. L. Gore & Associates, Inc, Flagstaff, Ariz) graft for a patient who has large spontaneous splenorenal shunt.

CASE REPORT

A 53 year-old man weighing 43 kg has been diagnosed with alcoholic liver cirrhosis when he was 35 years old. Liver function had gradually deteriorated and preoperative computed
tomography scan and ultrasound revealed markedly narrowed portal vein due to organized thrombus with small hepatofugal portal flow and a large spontaneous splenorenal collateral (Fig. 1). Living donor liver transplantation using the right hemiliver (820 gram, graft-to-body weight ratio : 1.9) from his son was performed.

1) Operative procedure

At surgery, massive ascites, markedly shrunk cirrhotic liver, and huge engorged collateral veins were found around the pancreas and stomach. The extrahepatic portal vein which showed phlebsosclerotic change was isolated without difficulty. The area of spleno-superior mesenteric venous confluence was not able to approach due to abundant venous collaterals. The duodenal second portion and pancreatic head area were mobilized from the anterior surface of inferior vena cava through the relatively avascular plane, and full length of left renal vein was exposed with careful preservation of collaterals. After total hepatectomy of the recipient, the left renal vein was divided at the inferior vena caval joining point. The vena caval stump of left renal vein was suture closed and the distal left renal vein was anastomosed to a 16 mm in diameter interposition PTFE graft which was 6 centimeter in length in an end-to-end fashion (Fig. 2, 3). A right hepatic lobe graft was harvested from his 25 year-old son. At back table, the main right hepatic vein of the graft and the middle hepatic vein was anastomosed using a cryopreserved cadaveric iliac artery interposition graft to make large single hole for the anastomosis. Additional nearby located two inferior right hepatic veins were joined together as a single lumen in a fish-mouth fashion. Then, the graft was placed orthotopically and all of the graft hepatic veins were anastomosed to the inferior vena cava. The graft portal vein was anastomosed to the interposition PTFE graft. The clamps applied to the hepatic venous outflow and portal inflow were removed, and the graft liver was reperfused. The cold and warm ischemic time was 135 min and 45 min, respectively. The liver was reperfused promptly from the blood flow through the left renal vein. Using microsurgical technique, the arterial anastomosis was performed and the duct-to-duct biliary reconstruction was done. Adequate blood flow in the intrahepatic

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**Fig. 1.** Preoperative abdominal CT scan revealed a large spontaneous splenorenal collateral (arrow).

**Fig. 2.** Schematic illustration of renoportal anastomosis using an interposition polytetrafluoroethylene graft for a patient with large spontaneous splenorenal shunt.

**Fig. 3.** Portal vein anastomosis. The donor portal vein is anastomosed to the left renal vein with an interposition polytetrafluoroethylene graft in an end-to-end fashion.