Introduction

Living donor liver transplantation (LDLT) is widely performed in South Korea. To obtain sufficient graft volume, LDLT, using right lobe graft is preferred. However, the risk to the donor is a matter of interest, especially when the future remnant liver of the donor is less than 35% of original liver. Although a donor has a relatively large right lobe that is suitable as a graft for a larger recipient, the remaining left lobe may be too small to maintain a donor’s life in many instances. In this particular circumstance, the donor cannot be accepted to donate the left or right liver for a larger-size recipient. As an alternative, dual left lobe grafts from two living donors into one recipient can make up for graft size insufficiency and secure the donors’ safety.

Case Report

A 60 year-old blood type B Rh+ male patient was admitted to a tertiary hospital for compensated liver cirrhosis and within-Milan hepatocellular carcinoma. He had a history of chronic HCV hepatitis, which was infected 30 years ago by transfusion when he had abdominal exploration and segmental resection of small intestine due to trauma. LDLT was planned and two donor candidates were evaluated for liver donation. Donor A was a younger brother to the recipient and blood type was B Rh+. Another donor (donor B) was nephew to the recipient. His blood type was AB Rh+. After evaluation both were found to be physically fit for donation, but the future remnant liver volumes or the left lobe volumes were less than 35% (figure 1). The GRWR of the left lobes from both donor candidates were less than 0.8%. Finally, dual left lobe graft LDLT was decided. A major technical issue in LDLT, using dual left loberafts is the configuration of the grafts. One of the dual graft is orthotopically implanted at the original left position. The second liver graft is heterotopically positioned to the right upper fossa and rotated in 180°. In this manner the hilar structure of the heterotopic graft is positioned in reverse location. That is, the bile duct comes to lie behind the portal vein and hepatic artery. For implantation of the second heterotopic graft, technical modification is made. The bile duct is anastomosed in prior to portal vein anastomosis. Since the second graft is held in relatively redundant architecture, undue tension is exerted to the hilum and hepatic vein. To relieve the distance between the recipient's right hepatic vein and left hepatic vein of heterotopic graft is bridged by interposition of cadaveric pericardial graft (Figure 2). Also, an isolation bag filled with 500mL of normal saline is inserted beneath the second graft. This is a novel modification to the originally described dual-graft LDLT procedure which used tissue expander.

Results

The cold ischemic time of the first and second grafts were 190 and 240 minutes, respectively. The total operation time was 770 minutes. Immunosuppression was the same as that of a single graft transplant. Postoperative liver function was satisfactory, and there were no specific complications related to this particular surgical technique. A daily-reduced saline-filled isolation bag was completely removed on operative day 14. The patient was discharged on postoperative day 25 without an episode of rejection. A postoperative follow-up CT scan of the patient demonstrated the balanced regeneration of both grafts (figure 3).