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An Alternative way to Secure the Anastomosis of Tiny Hepatic Artery in Living Donor Liver Transplantation

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Letter

Hepatic artery reconstruction has made living donor live transplantation (LDLT) more technically demanding because of the artery size of living donor is smaller and shorter than that of deceased donor. Artery thrombosis and bleeding are sources of morbidity and mortality after liver transplantation with the incidence rates from 6% to 12.5% [1,2]. Microscopic surgery has been suggested to prevent hepatic artery thrombosis to less than 5% [3], however, the issues regarding arterial reconstruction we still need to deal with. Surgeons may be encountered with diameter discrepancy and arterial kinking during operation. In our previous report, we suggested use fibrin glue assisted hepatic artery fixation to prevent arterial kinking in LDLT surgery [4], but size mismatch still remains an unsolved problem. Herein, we proposed an alternative way to overcome vessel size discrepancy in LDLT.

Surgical Technique

A 57 year-old male received a right partial liver graft from his son for alcohol related liver cirrhosis. The diameter of graft right hepatic artery was 1 mm. Therefore, we performed high hilar dissection in order to deal with vessel size discrepancy in the recipient surgery. After high hilar dissection was performed, left and right hepatic arteries were dissected up to intrahepatic bifurcation. However, the recipient's hepatic artery was thick and the diameter of it was 1 mm with redundant vessel length. Redundant vessel may lead to arterial kinking which often causes postoperative artery thrombosis, especially in tiny vessel. Therefore, we design a hepatic artery interposition graft with a distal diameter of 1.5 mm and a proximal diameter of 3 mm to overcome vessel size discrepancy. Hepatic artery reconstruction was then processed under microscope using 8.0 nylon sutures interrupted by a plastic surgeon with invagination method. With the interposition graft, hepatic artery was reconstructed with rational diameter ratio at both distal and proximal anastomosis sites and with appropriate vessel length (Figure 1).

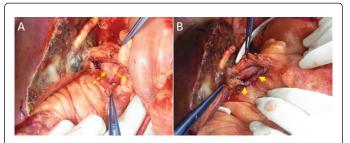


Figure 1: (A) A redundant vessel noted after hepatic artery (HA) reconstruction in order to overcome vessel size discrepancy; the resection area marked with yellow arrows. (B) A straight hepatic artery without kinking with the aid of interposition graft for vessel reconstruction; both anastomosis site (marked by yellow arrows) are in good patency.

Rickard et al. [5] mentioned four models to manage size discrepancy included an invagination anastomosis, a fish-mouth incision of the smaller vessel, and an oblique section of the smaller vessel and a wedge excision of the larger vessel. Wedge excision of the larger vessel proved to be the best construct, where a vessel diameter ratio is 1:2, and a vessel ratio of 1:3 leads to flow separation which may cause artery thrombosis. Chen et al. [6] used open-Y anastomosis technique to overcome size mismatch in head and neck free flap surgery, but we can't always find a bifurcation branch for anastomosis in right partial liver graft every time. Lin et al. [7] used a radial artery interposition graft to reconstruct hepatic artery when right gastroepiploic artery was not suitable for reconstruction. This could be an alternative option for reconstruction but more time consuming. Rickard et al. [8] discovered that a diameter ratio greater than 1:2.5 was not favored in end - to - end anastomosis in animal study due to tissue inflammation and vessel wall necrosis, therefore, we design our interposition hepatic artery graft ratio to be 1:1.5 which will do less injury to vessel itself in invagination anastomosis.

Hepatic artery reconstruction is a crucial and technique demanding step in LDLT. It is even more difficult when facing discriminate diameter discrepancy. An interposition hepatic artery graft may be a good solution to solve the problems of size mismatch and vessel kinking. Besides, with this surgical technique, interventional angiography can be performed easily if ever needed. Citation: Lin Shih-Lung, Chen Yao-Li, Hung Yu-Ju (2016) An Alternative way to Secure the Anastomosis of Tiny Hepatic Artery in Living Donor Liver Transplantation . J Transplant Technol Res 6: 170. doi:10.4172/2161-0991.1000170

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