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

Lin Shih-Lung[2], **Chen Yao-Li**[1,3] **and Hung Yu-Ju**[1,3*]

[1]*Department of General Surgery, Changhua Christian Hospital, Changhua, Taiwan*

[2]*Department of plastic surgery, Changhua Christian Hospital, Changhua, Taiwan*

[3]*Organ Transplant Center, Changhua Christian Hospital, Changhua, Taiwan*

[*]**Corresponding author:** Hung Yu-Ju, Department of General Surgery, Changhua Christian Hospital, Changhua 50006, No 135 Nan-Hsiao Street, Changhua 500, Taiwan, Tel: 886-4-7238595; Fax: 886-4-7228289; E-mail: 149116@cch.org.tw

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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).

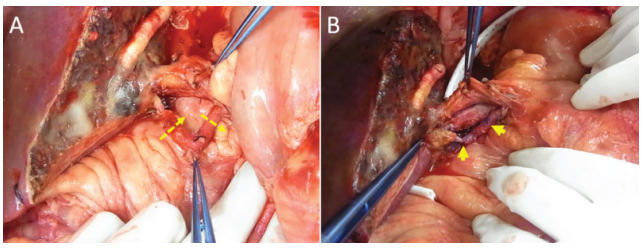

Figure 1: (A) A redundant vessel noted after hepatic artery (HA) reconstruction in order to overcome vessel size discrepancy; the resection area marked with yellow arrows. (B) A straight hepatic artery without kinking with the aid of interposition graft for vessel reconstruction; both anastomosis site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

References

1. Turrion VS, Alvira LG, Jimenez M, Lucena JL, Ardaiz J, et al. (2002) Incidence and results of ar-terial complications in liver transplantation: experience in a series of 400 trans- plants. Transplant Proc 34: 292-293.
2. Cavallari A, Vivarelli M, Bellusci R, Jovine E, Mazziotti A, et al. (2001)Treatment of vas-cular complications following liver transplantation: multidisciplinary approach. Hepatogastroenterology 48: 179-183.
3. Settmacher U, Stange B, Haase R, Heise M, Steinmuller T, et al. (2000) Arterial complications after liver transplan-tation. Transpl Int 13: 372-378.
4. Cheng YS, Lin PY, Lin KH, Ko CJ, Lin CC, et al. (2013) Innovative technique for pre-venting hepatic artery kinking in living donor liver transplantation. Liver Transpl 19: 664-665.
5. Rickard RF, Meyer C, Hudson DA (2009) Computational modeling of microarterial anastomoses with size discrepancy (small-to-large). J Surg Res 153: 1-11.
6. Chen YC, Scaglioni MF, Huang EY, Kuo YR (2015) Utility of "open-Y" anastomosis technique in the use of superior thyroid artery as recipient vessel for head and neck reconstruction with free flap. Microsurgery doi: 10.1002/micr.22384
7. Lin TS, Yang JC, Chen CL (2013) Hepatic artery reconstruction using radial artery interpo-sition graft in living donor liver transplantation. Transpl Int 26: 28-30.
8. Rickard RF, McPhaden AR, Hudson DA (2014) Healing of two microarterial anastomoses with diameter mismatch. J Surg Res 191: 239-249.