

Editorial

New insights in the management of the middle hepatic vein dilemma

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When the first series of adult-to-adult living donor liver transplantation (A2A-LDLT) were performed in Hong Kong [1], it was immediately clear that great technical challenges existed, mainly concerning the middle hepatic vein (MHV) tributaries management. In the initial Hong Kong experience, MHV was always included in the graft, with the intent to avoid a severe congestion in the graft right median sector and, consequently, to reduce the risks of mortality for the recipient [2].

Other centres proposed modified techniques in which MHV was preserved in the remnant donor liver [3]. This modified approach was proposed with the main intent to increase the donor safety, minimizing the risk for segment 4 (S4) congestion. However, in this modified approach, the risk of S5-S8 congestion was high [2]. Several strategies were proposed with the intent to overpass this technical challenge. The reconstruction of S5-S8 veins has been the most commonly proposed approach. Reconstruction has been performed using cryopreserved venous grafts [4], portal veins coming from the explanted livers or other homologous veins [5] or synthetic grafts [6]. Nevertheless, these reconstruction techniques were not completely free from the risk of complications (i.e., bleeding, thrombosis), mainly due to anatomical and technical complexities [7]. Some scholars even suggested to completely “by-pass” the MHV dilemma, directly using only a left lobe [8] or a dual left lobe transplant for A2A-LDLT [9]. However, these two last strategies have also been connected with several technical and ethical concerns [9].

Clear guidelines identifying how to manage the MHV do not exist. According to the Seoul experience, mandatory S5-S8 veins reconstruction is done in the following cases: (a) recipient model for end-stage liver disease (MELD) >20; (b) graft-to-recipient weight ratio <1%; (c) donor age >50 years; (d) dominance of MHV respect to right hepatic vein; (e) anterior sector larger than posterior and (f) S5-S8 vein calibre >5 mm [10].

Considering the great number of controversial aspects still arising from the MHV management, a recent study coming from the Hepatobiliary Surgery team of the First Affiliated Hospital, Zhejiang University School of Medicine, China, has added some new light on surgical strategies to use for the reconstruction of S5-S8 tributaries [11]. A total of 144 recipients receiving an A2A-

LDLT were divided in two groups: MHV reconstruction ($n = 101$) vs no reconstruction ($n = 43$). As expected, the overall survival was increased in patients with at least one of the tributaries reconstructed ($P = 0.022$; 5-yr OS: 76.2% vs 58.1%). These data were also corroborated by the results of a multivariable analysis, in which any type of MHV reconstruction was an independent protective factor for the risk of patient death. Specifically, patients with MHV reconstruction had a significantly reduced risk of death respect to subjects without any reconstruction.

Patients in which both the venous tributaries were reconstructed had better survivals compared to those with only one vessel reconstructed ($P = 0.034$; 5-yr OS: 83.6% vs 67.4%). Moreover, separately reconstructing S5 and S8 with two straight vascular grafts was connected with better results compared to using a Y-shaped vascular reconstruction ($P = 0.020$; 5-yr OS: 100% vs 75.0%).

The great innovation of the above mentioned study is to separately investigate different aspects of MHV tributaries reconstruction. If, on one side, several studies already stressed the importance of reconstructing S5-S8 tributaries respect to direct transplant without any reconstruction [12,13], on the other side no studies have been specifically reported the role of contemporaneously reconstructing both S5 and S8 veins, or the necessity to reconstruct them using separate grafts or a unique Y-shaped vessel. These aspects are of great importance, mainly in consideration of the high risk of thrombosis rates observed in literature. As an example, Ito et al. reported only 36% and 58% of long-term patency in S5 and S8 veins after their reconstruction [12]. Another important aspect to stress is the possible beneficial effect coming from the possibility to separately reconstruct S5-S8 tributaries, mainly due to a larger cross-sectional area of the two straight vascular segments respect to the Y-shaped vein. According to the observed data, the suggestions we can obtain from the Hangzhou experience is: (a) always reconstruct the MHV tributaries; (b) always reconstruct both the vessels, no matter on their diameter; (c) try to do the reconstructions separately, with the intent to increase the anastomotic area and to avoid distortion or compression of the anastomoses.

The small number of cases reported in the present series recommends caution. However, we can postulate that the main goal of a surgeon involved in an A2A-LDLT program should be to resemble as much as possible the normal anatomy. Studies based on larger populations are needed with the intent to definitively clarify this controversial aspect.

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Contributors

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