Middle Hepatic Vein Bleed During Donor Hepatectomy: Technique for Safe Practice

Madhusudhanan Jegadeesan^{*}, Neerav Goyal[†], Subash Gupta[†]

^{*}Department of Surgical Gastroenterology, Velammal Medical College Hospital & Research Institute, Madurai 625009, India and [†]Center for Liver and Biliary Sciences, Indraprastha Apollo Hospital, Delhi-Mathura Road, Sarita Vihar, New Delhi 110076, India

Safe performance of donor hepatectomy is crucial for sustainability of a living donor liver transplantation (LDLT) program. Middle hepatic vein (MHV) is always encountered during parenchymal transection irrespective of right or left donor hepatectomies. Here we present a safe and effective technique for tackling MHV bleed during LDLT from a single centre experience. (J CLIN EXP HEPATOL 2017;7:376–377)

In living donor liver transplantation (LDLT), mortality has been reported from catastrophic bleeding occurring through injury in middle hepatic vein (MHV) territory.¹ Safe performance of donor hepatectomy is crucial for sustainability of a LDLT program. Although intraoperative blood loss is usually low in high-volume transplant centers, one should always be prepared for the rare event of a major bleeding.² By virtue of its presence in the ischemic line, the MHV is always encountered during parenchymal transection irrespective of right or left donor hepatectomies. Since MHV is valve less and in direct communication with the inferior vena cava (IVC), a rent in this vein can lead to pulmonary embolism (PE) as well as massive bleed. Therefore, intraoperatively, prevention of bleeding from MHV and its major tributaries assumes paramount importance. We have evolved certain techniques from experience gained through more than 1900 LDLTs, which helps in tackling a major bleed in this area safely and effectively. The technique is based on the principle of total vascular exclusion with the modification for avoiding actual clamping of the IVC.³

In the pre liver transection phase, we dissect and expose the groove between the RHV and the MHV in the suprahepatic portion. The diaphragmatic attachment to the left of the MHV/LHV junction is also dissected and cleared up to the insertion of MHV/LHV into the IVC (Figure 1). In case of a major bleed during parenchymal transection from the MHV or from avulsion of segment 5 or Segment 8 vein from the MHV, the anesthetist is informed of the bleed, a

watch is kept on the end-tidal CO₂ to indicate PE, the patient is put in Trendelenburg position to reduce the chances of PE. Those branches are not divided until the completion of the parenchymal transection. This definitely increases the chance of avulsion of those branches. Hence we take extreme care in this phase of the operation to prevent such incidents. We will tighten a double loop around the entire porta hepatis to occlude the portal inflow, a clamp is applied at the MHV/LHV junction to avoid reverse bleeding from the IVC (Figure 1 inset). This clamping effectively stops reverse flow from the IVC, at the same time preserving the IVC flow to the heart. In the initial part of this maneuver, if the tear in the MHV is big, the anesthetist is also asked to stop the mechanical ventilation to avoid generation of negative pressure of inspiration in the chest and hence reduce the chances of PE. The respiration can be restarted within a minute usually as taking sutures over the tear becomes easy since the operative field becomes dry and clear. During the parenchymal

Figure 1 Suprahepatic IVC dissection exposing the groove between RHV and MHV. [Inset] Application of vascular clamp on middle hepatic vein.

Keywords: Donor hepatectomy, Liver transplant, Middle Hepatic Vein, MHV bleed

Received: 20.12.2016; **Accepted:** 2.05.2017; **Available online:** 19 May 2017

Address for correspondence: Madhusudhanan Jegadeesan, Department of Surgical Gastroenterology, Velammal Medical College Hospital & Research Institute, Madurai 625009, India.

E-mail: madhusj1982@gmail.com

Abbreviations: IVC: inferior vena cava; LDLT: living donor liver transplantation; LHV: left hepatic vein; MHV: middle hepatic vein; PE: pulmonary embolism; RHV: right hepatic vein

<http://dx.doi.org/10.1016/j.jceh.2017.05.008>

transection phase of the operation, we maintain a normal central venous pressure and employ hepatic inflow control maneuvers only if there is a major bleed from a hepatic vein, thereby maximizing donor safety.

We have come across 3 instances of major bleed from the MHV in our 1900 LDLTs. Out of which, two patients had avulsion of segment 8 vein from the MHV and one patient experienced with vascular clamp slippage from the MHV once the segment 8 vein insertion into the MHV had been cut. In all the 3 cases, the above maneuvers helped and all the donors had an uneventful recovery. The above described technique enhances the quality of the liver graft which is essential to living donor liver transplantation.

CONFLICTS OF INTEREST

The authors have none to declare.

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