

with the recipient's. After operation, the graft arterial flow was detected by Doppler ultrasound, angiography of computed tomography or magnetic resonance periodically. The patients were followed up for 6 to 34 months. Results Twenty of 80 (25.0 %) donor liver had hepatic arterial variation, which varied in left hepatic artery (LHA) (6.25 %), right hepatic artery (RHA) (12.50 %), combined LHA and RHA (3.75 %) and in common hepatic artery (2.50 %). Accidental arterial injury occurred in 6 cases (7.5 %), the injury incidence rate differed statistically between variation group and nonvariation group (25.0 % vs 1.7 %, $P < 0.01$). The most frequently injured location of artery was variant RHA (42.9 %), which reached a half of injured artery in variation group. The number of cases injured during graft harvesting were equal to that during graft back table trimming, but during trimming 60.0 % of injuries occurred in variation group meanwhile none in nonvariation group. The incidence rate of artery injury during harvesting period differed statistically between variation group and nonvariation group (10.0 % vs 1.7 %, $P < 0.05$). Eleven of overall 80 (13.8 %) grafts received artery reconstruction prior to OLT, and they all belonged to variation group. Especially 76.9 % of variant RHAs, arose from superior mesenteric artery, underwent reconstruction. In follow-up, no hepatic artery thrombosis (HAT) was observed, hepatic artery stenosis (HAS) appeared in 3 of 80 patients (3.75 %). Between variation group and nonvariation group, there was no statistical difference in the incidence of HAS (5.00 % vs 3.33 %, $P > 0.05$). Also no significant HAS incidence difference was found postoperatively between reconstruction group and nonreconstruction group (9.1 % vs 2.9 %, $P > 0.05$). Conclusions Variant RHA, often to be reconstructed prior to OLT, is the most common type of donor hepatic arterial variation. The variation of donor hepatic artery, especially variant RHA, increases the risk of injury during liver harvesting and trimming. Neither variation of hepatic artery nor proper arterial reconstruction before OLT does increase the risk of HAT and HAS.

【Key words】 liver transplantation; hepatic artery; reconstructive surgical procedures

肝移植术后动脉并发症是最严重的并发症之一,重者可导致移植物丧失、受体死亡,常需再次移植。肝动脉的解剖变异、病理改变、吻合方法技术等被认为与移植后动脉并发症的发生有关,有学者认为供肝动脉间的附加吻合增加肝动脉血栓形成 (hepatic artery thrombosis, HAT) 的风险^[1]。本文总结 2004 年 3 月至 2006 年 7 月单个医疗组完成的 80 例成人肝移植的资料,研究供肝动脉变异、损伤、植入前重建与动脉并发症的关系。

资 料 和 方 法

一般资料 80 例肝移植受体,男女比例 4.7:1,年龄 (48.0 ± 9.8) 岁。供受体 ABO 血型相合。受体:肝细胞癌 54 例,肝炎后肝硬化 12 例,肝门部胆管癌 5 例,胆汁性肝硬化 6 例,肝内胆管癌 2 例, Wilson 病 1 例。其中二次肝移植 1 例、肝肾联合移植 1 例。

供肝切取方法 采用快速肝脏切取法或肝肾联合切取法。主要方法:供体心跳停止后快速开腹,腹主动脉插管,注水囊阻断胸主动脉,插管处结扎腹主动脉,0~4℃ HCA 液 2 500 mL 灌注。肠系膜上静脉插管至门静脉主干,0~4℃ HCA 液 1 000 mL +

UW 液 1 000 mL 先后灌注,灌注压 100 cmH₂O,保持流出道通畅。完整切取小网膜,切取胰腺颈体尾及胰头大部 (低位离断胆总管),保留肠系膜上动脉 (superior mesenteric artery, SMA) 根部 5 cm,切取肠系膜上动脉到膈肌段腹主动脉。切取一侧髂血管。切开胆囊底,经胆管断端插管至肝总管, HCA 液 200 mL 灌洗肝内外胆道、胆囊。门静脉再灌 UW 液 2 000 mL。全组热缺血时间 (3.5 ± 1.3) min。冷缺血时间 (10.6 ± 2.1) h。

供肝修整方法与供肝变异动脉识别 供肝置入 4℃ UW 液盆中,解剖肝上下腔静脉,距离肝静脉根 1 cm 剪除多余腔静脉。解剖肝下下腔静脉,结扎右肾上腺静脉及数支肝短静脉。解部门静脉,结扎离断脾静脉、肠系膜下静脉及小分支。游离胆总管至胰腺上缘。解剖肠系膜上动脉,识别有无异位肝动脉。解剖腹腔干、脾动脉,保留后者 5 cm 长。解剖胃左动脉 (left gastric artery, LGA), 观察肝胃韧带有无异位肝动脉。解剖肝总动脉 (common hepatic artery, CHA)、胃十二指肠动脉 (gastroduodenal artery, GDA), 保留可能的胆管分支,结扎离断胃右动脉。

变异动脉经亚甲蓝液动脉腔内注入染色,显示动脉走行及供应肝脏范围。根据 Hiatt 分型^[2]统计