Segment 4 Architecture and Proposed Parenchyma-Wise Technique for Ex Vivo Graft Procurement and Implantation

Dr. Ramadan M. El Gharbawy, Bakr M. Nour

Abstract
Parenchyma-wise technique for the ex vivo procurement of segment 4 (S4) grafts, based on the detailed architecture of the segment, is proposed. Eighteen normal, fresh livers from adult cadavers were injected differentially with colored latex; dissection casts were prepared; and the intricate architecture of S4 was studied. The portal vein elements of the sheath forming most of the inferior part of S4 (S4b) and the superficial major fraction of its superior part (S4a) arose constantly from the medial aspect of the umbilical part of the left portal vein branch. The arterial elements arose constantly from a branch, whose diameter ranged from 2.00 to 3.35 mm (mean 5 2.61 ± 0.54 mm) and whose length ranged from 15.15 to 45.65 mm (mean 5 27.98 ± 12.13 mm). The biliary elements coalesced as a single duct at the corner, which was formed from the umbilical and transverse parts of the left portal vein branch; the duct’s diameter ranged from 2.90 to 6.85 mm (mean 5 3.90 ± 1.34 mm). Theoretically, this parenchymal mass—S4b and the superficial fraction of S4a—could be procured for implantation in an infant, and the rest of the liver could be split for an adult and a child. The portal vein branches of the graft would be procured with a patch from the medial aspect of the donor’s umbilical portion of the left portal vein branch. This umbilical portion would be reconstructed with a patch from the donor’s round ligament. The recipient’s portal vein would be reconstructed through the fashioning of a conduit anastomosed with the graft’s venous patch. Liver Transpl 19:1189-1201, 2013. VC 2013 AASLD