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The surgical anatomy of the biliary tree for living donor liver transplantation

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In 1963 Starzl performed the first successful human liver transplantation. Nowadays it is a routine operation. The shortage of cadaveric organs has led to the development of partial living donor liver transplantation (LDLT). LDLT in children uses the left lateral lobe (segment II and III). To avoid small-for-size graft syndromes in adult patients, many centres use right-lobe grafts. Right-lobe LDLT has become an important therapeutic option for adult patients suffering from end-stage liver disease. Different series have shown encouraging results, reporting 1-year graft and patient survival rates of up to 80% (Marcos 2000; Miller et al. 2001). Nevertheless, right-lobe LDLT still represents a challenging surgical procedure in which the donor's safety must be paramount. The basis of the LDLT is the detailed knowledge of variations in segmental anatomy and the ramifications involving the portal and hepatic venous systems, and hepatic ducts. We designed a new synthetic resin corrosion cast method in order to study these variations. Two years ago in Belgrade we presented the arterial blood supply of liver segments, showing important anastomoses between liver segments and portal variations made by our new method. Smadja and Blumgart (1994) have classified the biliary variations into six main types. The variations in the anatomy of intrahepatic bile ducts also complicate operations in LDLT (biliary complication rates are between 10 to 20 per cent in the ex situ partial liver transplantation (Rogiers et al. 2002). Therefore, the aim of the last two years of research was to examine these variations of the biliary tree based on our new synthetic resin corrosion cast method. Until now 30 biliary corrosion casts have been prepared. We found a normal variation (type A) in 19 preparations (63,33%). In 7 preparations (23,33%), there is an aberrant drainage of the right segmental ducts (right posterior or right anterior hepatic ducts) into the left hepatic duct. In one of these preparations (3,33 %) the right anterior hepatic duct fused with the left hepatic duct, the right posterior hepatic duct fused with the cystic duct, and the resulting two ducts fused to form the "bile duct". In another preparation, the right anterior hepatic duct fuses with left, and the right posterior hepatic duct drains into this common duct 15 mm below the confluence and 16 mm above the cystic duct's entry Conclusion: The branching pattern of intrahepatic biliary tree was atypical in 36,66% of cases. Since the biliary complication (biliary leakage and stenosis) remains a major cause of morbidity after liver transplantation, the knowledge of the biliary variants is essential for the successful surgical management of LDLT.

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