

Laparoscopic living donor hepatectomy for liver transplantation in children

Daniel Cherqui, Olivier Soubrane, Emmanuel Husson, Eric Barshasz, Olivier Vignaux, Mourad Ghimouz, Sophie Branchereau, Christophe Chardot, Frédéric Gauthier, Pierre-Louis Fagniez, Didier Houssin

Summary

Background Because cadaveric organ donors are in short supply, living donors are increasingly being used in transplantations. We have developed a safe and reproducible method for laparoscopic liver resection.

Methods Left hepatic lobectomy (resection of segments 2 and 3) was done by laparoscopy in one woman aged 27 years and one man aged 31 years. The grafts were prepared under laparoscopy, without any vascular clamping, and were externalised through a suprapubic Pfannenstiel incision. Both grafts were transplanted conventionally to the patients' respective sons, who were both aged 1 year and had biliary atresia.

Findings Donor operations lasted 7 h for the woman and 6 h for the man, and warm ischaemia times were 4 and 10 min, respectively. Blood loss was 150 and 450 mL, respectively, and no transfusions were required. Neither patient had complications during or after surgery; and hospital stay was 7 and 5 days, respectively. Both recipients are alive and have excellent graft function.

Interpretation We have shown the feasibility of laparoscopic living donor hepatectomy from parent to child. If the safety and feasibility of this procedure can be shown in larger series, laparoscopic donor left lobectomy could become a new option for paediatric living donor liver transplantation.

Lancet 2002; **359**: 392–96
See *Commentary page 368*

Department of General and Digestive Surgery, Hôpital Henri Mondor 94010, Créteil, France (Prof D Cherqui MD, E Husson MD, Prof P-L Fagniez MD); **Departments of General and Digestive Surgery** (Prof O Soubrane MD, Prof D Houssin MD), **Anesthesiology** (E Barshasz MD, M Ghimouz MD), **and Radiology** (O Vignaux MD), **Hôpital Cochin, Paris; Department of Pediatric Surgery, Hôpital de Bicêtre, Kremlin-Bicêtre** (S Branchereau MD, C Chardot MD, Prof F Gauthier MD)

Correspondence to: Prof Daniel Cherqui
(e-mail: daniel.cherqui@hmn.ap-hop-paris.fr)

Introduction

Because cadaveric donors are few, living donor liver transplantation (LDLT) has become a life-saving option for some patients in urgent need of liver transplantation.^{1–5} Such patients include children with rapidly progressive liver failure, in whom full paediatric grafts, reduced-sized grafts, or split grafts from cadaveric donors might not be available in time.⁶ Living donors provide excellent quality grafts and allow a scheduled transplantation. However, this procedure is restricted by the surgical risk for the donor, including a 20–40% morbidity rate, and an estimated mortality rate of 0.2%.^{7–10} Irrespective of these risks, LDLT has been developed as the only option in Japan, where cadaveric donors are not available,^{3,4} and as an alternative to cadaveric organs in more-developed countries that have a shortage of donors.^{1,2,6,11} In addition to surgical risk, graft resection needs a major abdominal incision, even when only the left lobe is resected for a small child.

To reduce morbidity and the invasiveness of living donor nephrectomy, several renal transplant teams have developed the laparoscopic approach to this procedure.^{12–14} We, and others, have investigated laparoscopy for liver resections.^{15–19} Left lobectomy (also called left lateral segmentectomy) seemed to be a safe and reproducible laparoscopic procedure, and we therefore postulated that it could be applied to LDLT in children, in whom a small graft is sufficient.

Patients and methods

Setting

This project was developed by two adult and one paediatric hepatobiliary units. These units have been involved in a transplant network, with combined expertise in partial liver resection; adult and paediatric liver transplantation, including LDLT; and laparoscopic surgery; and have all modern surgical technology available. The ethics committee of Hôpital Henri Mondor, Créteil, France approved the study. The laparoscopic procedure was proposed to the donors, who were informed of the innovative nature of the procedure and who gave written consent.

Patients

Both recipients had biliary atresia and had undergone portoenterostomy at the age of 2 months. Irrespective of this operation, jaundice had progressed, and ascites and liver failure worsened, and both children were listed for liver transplantation. No suitable donor was found for the first child after 4 months on the waiting list, and the child's health gradually worsened. The second child had acute liver necrosis after he had been on the waiting list for 2 months, and emergency liver transplantation became necessary.