Liver transplantation in Hong Kong

Liver transplantation (LT) is the therapy of choice for end-stage liver disease. Factors contributing to its increasing success include improved anaesthetic and surgical techniques, enhanced donor organ preservation, better recipient selection, and more specific management of transplant rejection. More patients are being referred for consideration of such therapy as the success of LT is better known. The Prince of Wales Hospital (PWH) LT programme's overall actuarial 1-year survival for non-urgent cases to date is 84%. In Hong Kong, approximately 10% of the population are hepatitis B chronic carriers, and 25% of these patients will eventually die of hepatitis B–related complications.[1] Relaxation of prerequisites for potential recipients and indications for LT have increased the demand for LT. In this review, based on the PWH LT programme experience, local issues concerning LT in Hong Kong are highlighted.

Selection of patients and timing of transplantation

Liver transplantation should be viewed as part of the long-term management strategy for end-stage liver disease. Prognostic assessment is based on functional status, nutrition status, blood clotting, ascites, jaundice, and encephalopathy. Those patients with fewer and less severe complications have a better chance of survival.[2] Consequently, delay in referral for LT should be avoided.

Patients referred for transplantation assessment should be reviewed by a team. Most recipients should fall into Child-Pugh's categories B and C[2]—usually the patients have complications from liver decompensation. Patients must understand the requirements after LT, particularly with respect to the need for lifelong immunosuppression. Support from family and the community, as well as the health system are essential for good post-transplant outcomes. Consequently, governmental funding affects LT outcomes directly and indirectly. Social and psychological problems are relative contraindications, whereas uncontrolled bacterial infection, disseminated malignancy, and advanced multisystem disease remain absolute contraindications to LT.

Indications

Viral hepatitis B

Hepatitis B is the main cause of liver disease for the vast majority of patients requiring LT in Hong Kong. Liver transplantation for hepatitis B infection was once disappointing because of recurrent hepatitis in the graft. The classic lesion of recurrent hepatitis B infection in the graft is a fibrosing, cholestatic hepatitis. More recently, the use of an antiviral agent—lamivudine, a nucleoside analogue, either given alone or with hepatitis B immunoglobulin—has been associated with good results.[3]

Acute fulminant hepatic failure

Most cases of fulminant hepatic failure (FHF) in Hong Kong are due to hepatitis B. Liver transplantation is the only effective treatment for progressive FHF.[4] Early recognition of the need to transfer such patients to units with an LT programme is therefore essential. For patients who show continual decline, LT before irreversible cerebral injury or other systemic failures is limited by donor organ availability. Living donor LT practically represents the only chance of survival for these patients.

Hepatocellular carcinoma

Survival after surgical resection of hepatocellular carcinoma (HCC) is limited by a high recurrent tumour rate and progression of underlying liver disease.[5] Total hepatectomy with LT offers radical tumour removal even in patients with multifocal disease or severe cirrhosis. It removes the possibility of metachronous lesions developing in the liver remnant. Good results are now achievable with LT in selected patients with intrahepatic HCC without vascular infiltration, with a solitary tumour of ≤5 cm in diameter; or up to three lesions with diameters of ≤3 cm.[6] However, due to organ shortage and resource limitation, liver resection should remain the first-line therapy option. Only 10% to 15% of patients are candidates for resection at presentation.[7] This leaves LT as the only option for cure in many patients.

Organ shortage and allocation

Hong Kong has adopted a voluntary system (informed consent) of organ donation. The severe donor organ shortage in Hong Kong is a complicated issue that involves cultural, traditional, and religious values. Better professional awareness and public education should have a positive impact but the results will take a long time.[8]

Organ allocation in LT is based primarily on blood group and body size matching. However, the organ shortage has resulted in rationing of donated livers. While difficulties remain as to how best to allocate this scarce resource, patients who are the sickest or have been waiting the longest may not necessarily receive a transplant first. With respect to living donor LT in Hong Kong, with arguable justification, first-, second-, and third-degree relatives or spouses can donate their organs without the need for approval from the Human Organ Transplant Board.

Suboptimal or 'marginal' donors offer an important source for increasing donor organ supply. Organs from these donors were known to be associated with graft primary non-function. In the modern era of LT, however, many of the donor factors previously considered adverse are no longer detrimental to successful LT.[9] Suboptimal donors have

contributed 70% of organs transplanted at the PWH. Sadly, many potential donors are still not given intensive care management for graft optimisation.

Development of innovative surgical approaches

A variety of approaches have been developed to combat donor organ shortage—regrafting of a transplanted liver, transplanting organs from non–heart beating donors or ABO incompatible donors, or domino LT. However, these would have limited impact locally.

Reduced-size liver transplantation

Due to organ shortage and size mismatch, historically paediatric patients experienced high waiting list mortality. The first reduced-size LT was performed in Europe in 1984.[10] In reduced-size LT, an adult liver is cut down to a left lobe or left lateral segment, which is then used as a transplant for a child. The remaining liver is discarded. Although this technique is able to reduce the mortality of children, it places adult recipients at a relative disadvantage.

Split liver transplantation

In 1988, Pichlmayr et al[11] described a splitting procedure that allows one cadaveric donor liver for two recipients, usually one adult and one paediatric recipient. A case series from Los Angeles comprising 110 consecutive split LTs showed that split LT can be performed with similar survival rates to grafting of whole livers.[12] However, considerable resources and manpower are required. The mainly suboptimal donors available locally also limit its application.

Living donor liver transplantation

The first successful LT from a living donor was performed in Australia in 1989 by Strong et al.[13] Factors contributing to the better results among paediatric living donor LT include good quality of graft, shorter cold ischaemic time, and the ability to plan the LT procedure and to prepare the recipient. Although living donation of a left-side liver graft works well in children, left-side grafts are rarely large enough for an adult recipient. Indeed, a liver graft of less than 0.8% of the recipient's body weight has a high risk of early postoperative graft dysfunction.[14] As a consequence, adult-to-adult LT using right-side grafts has been initiated in recent years.[15] There remain considerable moral and ethical considerations to the use of this approach; at least six unconfirmed deaths have been noted in the literature to date.[16]

Conclusion

There are two well-established LT programmes in Hong Kong. As shown by Lo et al,[17] the original challenges of LT have largely been overcome. The remaining problems relate primarily to the shortage of donor organs and lack of funding. Utilisation of suboptimal donors and living donors offer some short-term relief to the organ shortage. Surgical expertise is available here in Hong Kong. However, in order to enable a quality LT service to continue and expand to meet demands, governmental funding is required.

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