



ORIGINAL ARTICLE

New insights after the first 1000 liver transplantations at The University of Hong Kong



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Summary *Background/objective:* One thousand liver transplantations have been performed at the only liver transplant center in Hong Kong over a period of 22 years, which covered the formative period of living donor liver transplantation. These 1000 transplantations, which marked the journey of liver transplantation from development to maturation at the center, should be educational. This research was to study the experience and to reflect on the importance of technical innovations and case selection.

Methods: The first 1000 liver transplantations were studied. Key technical innovations and surgical therapeutics were described. Recipient survival including hospital mortality was analyzed. Recipient survival comparison was made for deceased donor liver transplantation and living donor liver transplantation indicated by hepatocellular carcinoma and other diseases.

Results: Among the 1000 transplantations, 418 used deceased donor grafts and 582 used living donor grafts. With the accumulation of experience, hospital mortality improved to < 2% in the past 2 years. In the treatment of diseases other than hepatocellular carcinoma, living donor liver transplantation was superior to deceased donor liver transplantation, with a 10-year recipient survival around 90%.

Conclusion: Transplant outcomes have been improving consistently over the series, with a very low hospital mortality and a predictably high long-term survival.

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1. Introduction

Liver transplantation (LT) was invented by Starzl et al in the 1960s¹ and became a legitimate treatment in the 1980s.² The impressive improvement in recipient outcomes was the result of four areas of medical research. Cold storage of livers in University of Wisconsin solution has extended the graft preservation time³ and improved long-term graft survival.⁴ Cyclosporine as the first calcineurin inhibitor used is efficacious in reducing graft rejection.⁵ Prevention of activation of hepatitis B virus (HBV) with passive immunoprophylaxis⁶ and then by antiviral agent lamivudine⁷ has remarkably reduced HBV infection of grafts. Careful selection of patients with hepatocellular carcinoma (HCC) for LT has also contributed to a better rate of recipient long-term survival.⁸

Asia entered this surgical arena only in the early 1990s. In 1991, Hong Kong saw its first deceased donor LT (DDLT). Two years after Strong et al⁹ of Brisbane performing the first living donor LT (LDLT), Hashikura et al¹⁰ performed the first adult LDLT in 1993 outside Australia. Japan was instrumental in the development of LDLT, a long-awaited procedure for Asia where rates of organ donation from the deceased have always been very low.¹¹ Hong Kong had its first LDLT conducted in 1993 for a child; in 1994, it had its first adult LDLT.¹² In 1996, the first adult LDLT using the right liver placed Hong Kong on the world map of organ transplantation.¹³ As one of the world's leading centers in LT, here we give an account of our first 1000 cases and reflect on this experience. Only with a clear understanding of the past can we advance further in our work.

Our first 1000 LTs started in 1991 and were accomplished in October 2012. Among them, 418 were DDLTs and 582 LDLTs (Figure 1). There were 152 pediatric recipients. In the treatment of non-HCC diseases, LDLT surpassed DDLT in recipient survival, with a 10-year survival around 90% (Figure 2), but it was outperformed by DDLT in the

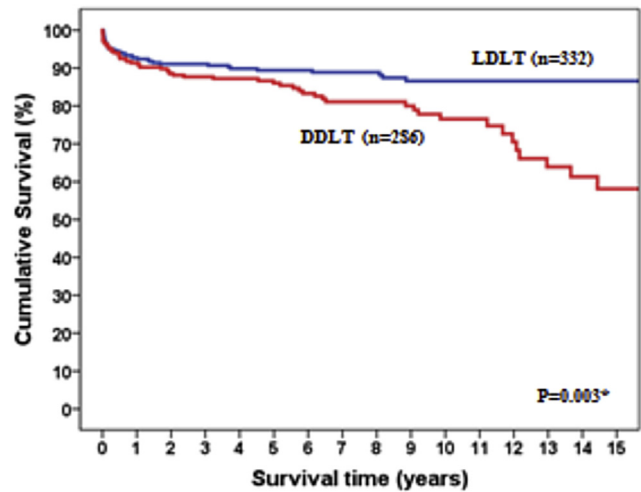


Figure 2 Adult recipient survival of transplants for indications other than hepatocellular carcinoma.

treatment of HCC, with a 10-year survival of around 70% only (Figure 3). The hospital mortality of LT had been reduced to < 3% since 2006 and was < 2% in 2011 and 2012 (up to October; Figure 4).

2. Innovations

2.1. Inclusion of the middle hepatic vein in the right liver graft

In 1990, Tanaka et al¹⁴ used the right liver in a pediatric LDLT to avoid a precarious anatomy of the left hepatic artery. In 1996, our center pioneered the use of the right liver in adult LDLT to provide a graft adequate in size for the recipient and to avoid small-for-size syndrome.¹³ As the

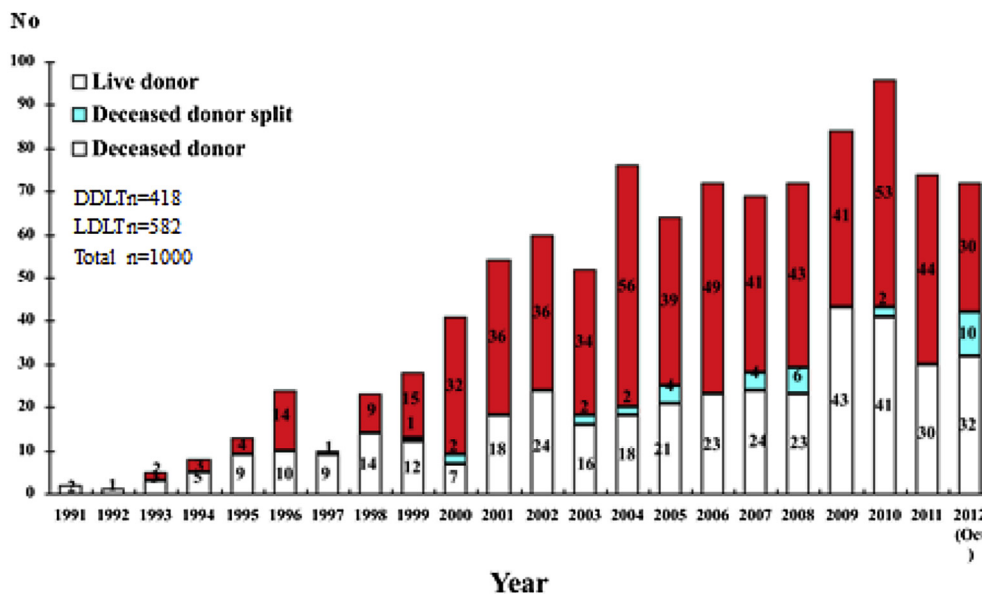


Figure 1 The first 1000 liver transplants at Queen Mary Hospital, the teaching hospital for The University of Hong Kong, with yearly numbers of transplant types. DDLT = deceased donor liver transplant; LDLT = living donor liver transplant.

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