Orthotopic Liver Transplantation at King Chulalongkorn Memorial Hospital: A Report

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Orthotopic liver transplantation (LT) is the treatment of choice for various liver diseases including early hepatocellular carcinoma (HCC). After the first successful LT in Thailand at King Chulalongkorn Memorial Hospital (KCMH) in 1987, the number of LT has gradually been increasing in parallel with the improvement in patient survival. The recent outcomes of LT are reported herein.

From January 1, 2002 to June 30, 2013, 120 cases of adult LT and 24 cases of pediatric LT were performed. The most common indication for LT was HCC in the adult whereas biliary atresia was the most common indication for LT in pediatric patients. As for the severity of liver disease, the average model of end stage liver disease (MELD) and pediatric end stage liver disease (PELD) scores were 19 in adult LT and 21.5 in pediatric LT, respectively. The most common perioperative complication in adult LT was acute renal failure (25%). One-, five-year patient survival in adult LT and pediatric LT were 85%, 69% and 96%, 91%, respectively.

In conclusion, the outcomes of LT at KCMH have gradually been improving close to the world standard, especially the patient survival.

Keywords: Liver transplantation, Patient survival, Thailand

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At present, orthotropic liver transplantation (LT) has been accepted as the standard treatment for end stage liver disease (ESLD) due to various chronic liver diseases, fulminant hepatic failure, including early hepatocellular carcinoma (HCC) and some kinds of metabolic diseases(1). The clinical feasibility of this procedure was demonstrated by Starzl et al(2) in 1963 at the University of Colorado, Denver, USA. However, the result was extremely disappointing, with one-year patient survival of approximately 30%(3). In the early 1980s, the introduction of the immunosuppressive agent, cyclosporine A, resulted in a dramatic improvement in graft and patient survival with one-year patient survival close to 70%(4). After then, the National Institute of Health Consensus Conference declared LT should be considered a therapeutic modality for patients with ESLD in 1983(5).

In Thailand, the first LT was performed at King Chulalongkorn Memorial Hospital (KCMH) on November 28, 1987 by Dr.Voravit Sriwatanawongs and colleagues(6). This first patient was hepatitis B virus (HBV)-related cirrhosis Child A with huge unresectable HCC. The perioperative course was uneventful but the patient expired 6 months later due to recurrent HCC.

After the successful beginning, 18 cases of LT were performed by the same surgeon between 1987 and 1995; this was considered the first era. Most patients survived for a short period. However, still few pediatric patients survived until the present. Then Dr. Sriwatanawongs moved to USA and his position was replaced by Dr. Supanit Nivatvongs. In the second era, Dr. Nivatvongs performed 20 cases of adult LT and 24 cases of pediatric LT. One-year survival was improving from 33% to 72% during 1997 to 2002(7) but still could not reach the world standard at that time. The main reason behind this was the lack of medical personnel such as transplant surgeon team, transplant coordinator, anesthesiologist, transplant hepatologist, intensivist, and interventionist. One surgeon had to do every step of organ transplant by himself from identifying potential donor, donor resuscitation, organ procurement to recipient operation including...
postoperative care. After 2002, there was gradual recruitment of the human resources. More medical personnel joined the team, and the system of organ transplant was set up. More surgeons came back from overseas training and having gained more experience; the results were markedly improved. This is considered the third era.

The outcomes of LT at KCMH in the third era from January 1, 2002 to June 30, 2013 were reported herein.

Recipient selection
All patients with ESLD were evaluated for LT regardless of their age and causes of underlying liver disease. The guideline of the American Association for the Study of Liver Diseases (AASLD) (8) for evaluation of liver transplant patient was followed. As for the HCC patients, Milan’s criteria (9) was also strictly followed. In the pediatric patient, the reduced size LT was considered first before July 7, 2008. After then, living donor liver transplantation (LDLT) was considered.

Donor selection
Absolute contraindications for donor organs included positivity of human immuno-deficiency virus (HIV), hepatitis B surface antigen, >30% macrovesicularsteatosis, or presence of extracranial malignancies. All other donors were considered; liver quality was evaluated by a surgeon and biopsied when needed during the donor operation before exclusion.

Organ allocation
Organ allocation rules (10) regulated by the Organ Donation Center, the Thai Red Cross Society was followed. Briefly, it was center-based rotation system, liver graft was allocated to the center. Each center has its allocation policy, mostly based on the model for end-stage liver disease (MELD) score to stratify the severity of the liver disease. At KCMH, MELD score has been used for organ allocation. As for HCC, Milan’s criteria were followed. The extent of the tumor, the severity of liver disease and the possibility of receiving bridging treatment were considered for organ allocation.

Immunosuppression
Maintenance immunosuppression regimens consisted of a triple regimen of cyclosporine A or tacrolimus, mycophenolate, and prednisolone. The induction with an interleukin 2 receptor antagonist (basiliximab) was considered for patients who had underlying chronic kidney disease stage 3 and 4, or patients who expected to suffer from postoperative acute renal failure for delayed administration of calcineurin inhibitor. Steroid was rapidly tapered and discontinued around three months postoperatively.

Results
From January 1, 2002 to June 30, 2013 there were 120 cases of adult LT and 24 cases of pediatric LT. The number of LT performed in each year is shown in Fig. 1. Sixteen cases of LDLT were performed; all of them were pediatric patients. The average age, genders, blood groups of adult LT are demonstrated in Table 1. The most common indication was HCC followed by HBV and HCV cirrhosis, as shown in Table 2. The average MELD score was 19, and average waiting time was 315 days with 47% waiting list mortality (MR). The most common perioperative complication was acute renal failure, shown in Table 3. The perioperative MR was 6.7%. 1-, 3-, and 5-year patient survival were 85%, 77% and 69%, respectively.

As for pediatric patients, 24 cases were

Fig. 1 The number of LT performed between 1/1/2002 and 30/6/2013 at KCMH.

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<th>Table 1. Age, gender, blood group of adult LT</th>
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performed. Sixteen cases were LDLT, and eight cases were cadaveric LT. The average age, gender, blood group, indication, PELD score and graft type are shown in Table 4. There was only one death in cadaveric group from fungal infection. The rest 23 patients have survived at the time of study. 1- and 5-year patient survival were 96% and 91%, respectively.

**Conclusion**

With the fulfillment of medical personnel and the better-organized transplant system, the results of LT at KCMH has been improving and reaching the world standard\(^1\) with 1- and 5-year patient survival (including adult and pediatric patients) 86% and 72%, respectively. Better outcomes and more variability of LT including split LT, adult LDLT are expected in the near future.

**Potential conflicts of interest**

None.

**References**

