

Production of Transplantable Liver Graft by our Hand
-Research mind for the children suffering from diseases and their families-

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In recent years the importance of translational research applying the development of basic scientific researches to the scope of medical science has been highlighted. Nevertheless, the research flow from basic to clinical is not in one direction, which needs to be synchronized with the development of clinical technology in order to decide objectives of basic researches. Here is the real value that medical doctors with experiences in clinical practices devote themselves to the advanced researches. The lecturer myself has been working with pediatric doctors in the clinical frontline to judge how the direction of researches to save suffering children should be by maximizing the experiences of having been involved in the treatment of live donor liver transplant for infants as a lethal method to confront with infant hepatic failures¹⁾²⁾. At this education lecture, the new liver treatment method toward which the lecturer has been challenging will be given by looking back live donor liver transplant therapy against infant hepatic failures³⁾⁴⁾. Also the importance of getting involved in basic researches by the clinical doctors will be explained.

In line with the development of live donor liver transplant therapy, it has become almost certain that we can save lives of children with hepatic failures. From the year 2000 through 2009 for 10 years I had been involved in the regeneration of hepatic artery in time for live donor liver transplant through the application of microsurgical technique as a team member of live donor transplant at Jichi Medical University (Figure 1) ²⁾.



(A scene from the live donor liver transplant at Jichi Medical University Hospital in 2002)

Most of the children who have been operated liver transplant are in good health 1).

On the contrary, it will become extremely difficult for the choice of live donors taking re-transplant for elder children in chronic hepatic graft malfunction into consideration. Having confronted with worries of families in choosing donor candidates, my zeal to find ways to fabricate transplantable liver has been stronger and stronger. Also the challenges to transplant during neonatal period against disease of inborn error of metabolism have been done so far. However, due to the emergence of hepatic encephalopathy, sometimes we have confronted with problems in prognosis cases. Toward the challenges, there have been clinical cases again focused on allohepatocyte transplant right after the birth. The therapy has an important meaning as a “Bridging” one to operate live donor liver transplant after the growth of neonatal period for the purpose of avoiding hepatic encephalopathy, which has led to the development of technology to generate transplantable hepatocytes *in vitro*. Also it has further led to the development of safe liver transplant method to protect against embolism which is the most crucial defect in hepatocyte transplant.

In the consequence, in recent years the research for transplanting directly the entire liver cultured for a long time has been developed (Figure 2)3) Furthermore, the author’s research has been heading toward regeneration of hepatocyte to fabricate organs (Organ Fabrication) together with lots of pediatric surgeons in clinical frontline by adjusting ourselves to the changes in the above clinical backgrounds.



(A scene from the entire pig cultured liver transplant at Jichi Medical University Pig Center in 2012)

The applied researches only become viable depending on the strong mindset of pediatric doctors to save suffering children. Also the treatment method should be continuously implemented to safer and more secured one by taking into consideration the mental pains of families to take care of these suffering children.

References:

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