Partial Liver Transplantation In Donor And Recipient Pairs Of Equal And Different Sizes

Thesis

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By

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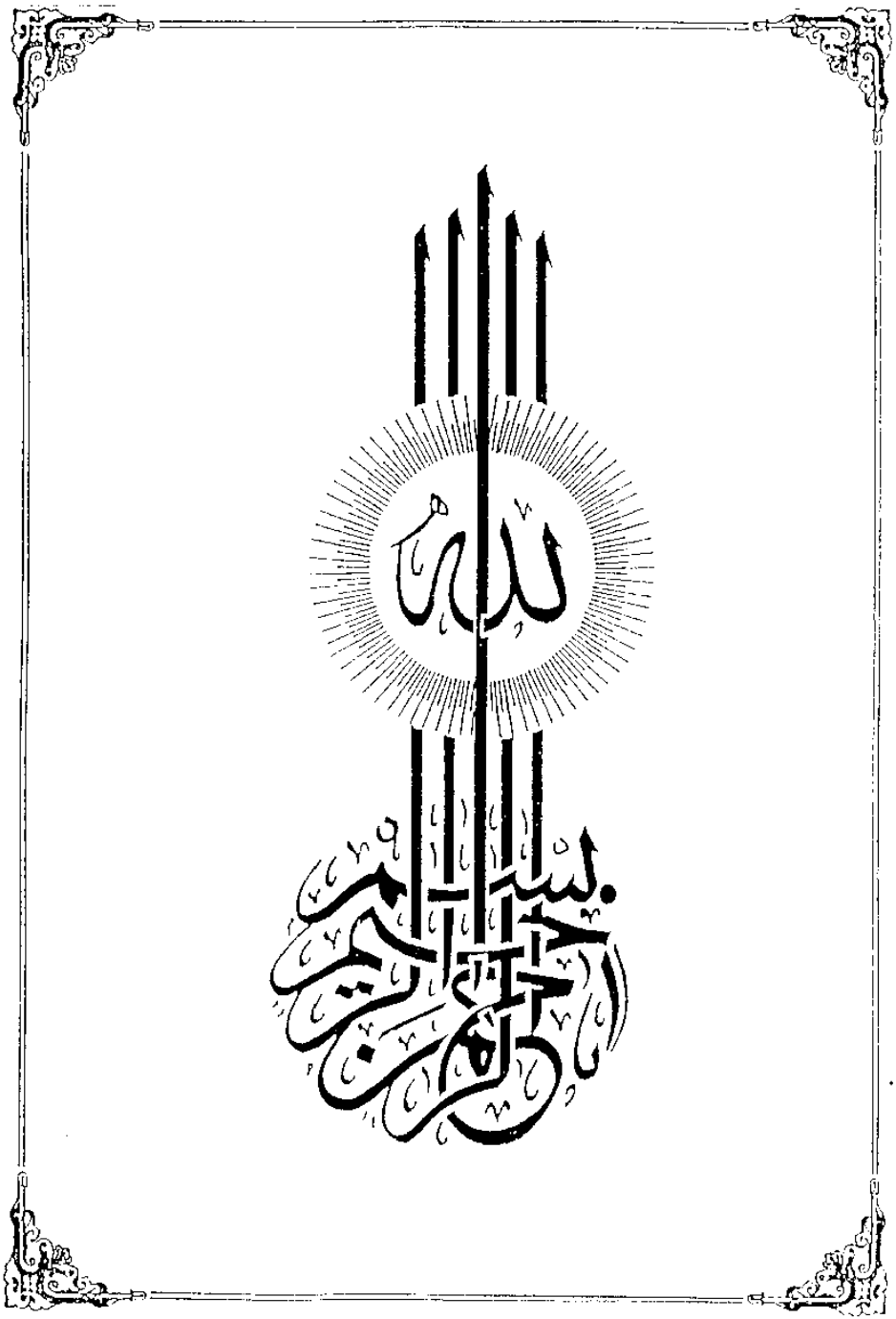

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1. introduction

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INTRODUCTION

Liver transplantation has evolved rapidly in the past few years and now provides as the most effective treatment for the most forms of chronic - end stage liver disease and acute or subacute liver failure in both children and adults (1). The liver can be transplanted in two different manners: either in orthotopic position after removal of the host liver and replacing it with a homograft in the same position *(orthotopic liver transplantation)* or in a heterotopic position where an extra liver is inserted at an ectopic site *(auxiliary liver transplantation)* (2,3).

Over the past 20 years, **orthotopic liver transplantation (OLT)** has proven to be the therapeutic choice in any patient with progressive irreversible liver disease likely to terminate fatally, for whom the standard therapy for the particular condition is no longer successful (3,4). Advances in surgical and anaesthetic techniques, improved post. operative care and medical management, introduction of cyclosporine A (CYA) as an immunosuppressant (5), the development of the University of Wisconsin (UW) preservation fluid and introduction of venous bypass during the anhepatic phase of the liver transplant operation (6) have resulted in a progressive improvement in the results of OLT (7).

With improved success, patient referral has increased at a rate far greater than that of organ donation. The shortage of donor organs has caused serious problem that limit the use of liver transplantation particularly in children (8).Two main obstacles exist in performing liver transplantation in children: The first is mismatching the donor and the recipient size, which is important for both vascular anastomoses and abdominal closure (9). In some cases, the large size of the liver graft renders transplantation technically difficult or impossible (10).The second

problem is the scarcity of heart-beating child donors. Starzl et al (11) adopted the use of pediatric donors for orthotopic liver transplantation in children and they have been successful in acquiring adequate number of pediatric donors in the United States. But in many countries, obtaining the liver grafts from child donors is exceedingly rare (10) . Because of the scarcity of pediatric donors together with the problem of size-matched cadaver organ donors, many children die while on the transplant waiting list (7).

The pressure of over-increasing candidate lists with a limited donor supply has stimulated innovative surgeons to pursue additional methods of graft expansion. The principle of a reduced-size grafts made it possible to use adult donors for children (10,12) .

Reduced-size hepatic transplantation (RLT) is used to reduce the size of the liver of a donor to provide a hepatic allograft for a recipient who is usually some what smaller than the donor. This technique is used for pediatric transplantation, when the donor availability is limited by the size of the recipient. The result of several studies done at institutions have demonstrated that reduced- size hepatic allograft provide excellent long term hepatic replacement, with survival results equivalent to transplantation using the whole liver grafts (13). One of the major changes in the liver transplantation has been the application of the reduced-size liver transplants (RLT). Despite the greater technical difficulty of performing reduced-size hepatic transplantation, RLT has the great advantage of expanding the pool of donors and decreasing pretransplant mortality in the pediatric age group. In the last several years, reduced-size liver transplantation for pediatric patients has become a standard procedure at many centers specializing in pediatric liver disease (14,15).

Following the progressive improvements and safe performance of "reduced-size hepatic transplants" the next logical development was the concept of the use of one graft to provide two viable grafts for two

separate recipients, **the split liver procedure (SLT)**. Recent anatomical studies of the liver have made much information available particularly the portal basis for the segmentation of the liver and individual biliary drainage of each segment (12),this allows the division of the liver into two transplants, each with an artery, portal vein, biliary duct and venous drainage (16) .There are two possibilities of splitting the liver parenchyma: either through the umbilical fissure, between the left lateral and left medial segments, or through the main liver fissure, between the left median and right median segments. The technique of the split liver, is one of the recent technical variant used to increase the flexibility of liver replacement and maximize the use of the donor liver pool (17).

The successful use of RLT and SLT provided the basis for the use of segments from living donors (18). Recently a preliminary study of hepatic transplantation in dogs, using living donors was done. The experience with living donors in animal laboratory combined with successful clinical experience with reduced-size and "split-liver" hepatic transplantation in children provide the technical foundation for transplantation using living donors in humans (19).

Living related liver transplantation (LRLT) has been used extensively at pediatric centers where no suitable cadaveric organ is available and in countries such as Japan, where brain death has not been accepted (20).

LRLT has several advantages over other forms of reduced liver transplantation :

1- The main advantage of LRLT over partial transplantation from brain-dead donors is the high viability of the graft, because the liver is obtained from a healthy donor under optimal conditions with limited preservation time. Assured viability would be highly favorable to transplant outcome.