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BRIEF REPORT

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Successful regrafting of a transplanted liver

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Abstract We report on the successful regrafting of a transplanted liver. The donor liver was first grafted into a patient suffering from cryptogenic cirrhosis; the patient died 1 day after the elective transplantation of cerebral bleeding. The well-functioning graft was harvested again and transferred to our institution. After another 12 h of cold ischemia, the liver was reperfused in an urgently registered patient with recurrence of hepatitis B in his first graft. The transplantation was successfully performed and the patient is now doing well, more than 5 months after regrafting with the reused liver.

Key words Retransplantation, liver · Liver, retransplantation

Introduction

The regrafting of a transplanted liver to a second recipient has been reported only once [5]. According to the literature, there have been five brief reports on retransplantations of kidney and heart grafts [1–4, 6]. In view of the cadaveric organ shortage and depending upon individual circumstances, it may be possible to use an organ twice or even more often. The immunological consequences beyond the surgical procedure would certainly be interesting. We report a case of successful second transplantation of a liver graft.

Methods and results

A 46-year-old male (blood group A-positive) first underwent orthotopic liver transplantation on 26 January 1993 due to chronic aggressive hepatitis B. On the day of transplantation, the patient was hepatitis Bs antigen-negative by standard serology. The patient was regularly tested and received prophylaxis with hepatitis B hyperimmunoglobulin.

One and a half years later, hepatitis Bs antigen reappeared, and a biopsy of the transplant confirmed recurrence of the disease. In spite of hepatitis B hyperimmunoglobulin and famcyclovir treatment, virus replication (by DNA PCR) persisted at a high level. In September 1995, the patient's condition progressed to decompensation and the patient was registered for retransplantation.

On 15 October 1995, a blood group-identical donor liver became available at the Department of Surgery in Hamburg. The donor had received the transplant 24 h earlier due to cryptogenic liver cirrhosis. Subsequently, he suffered from intracerebral bleeding (in all probability due to coagulation disturbances) and died with a well-functioning liver.

According to Eurotransplant rules, in a stable cardiopulmonary situation, a cadaver may serve as an organ donor. Thus, the decision was made to use the liver again. Prior to the first transplantation, the organ had been preserved with University of Wisconsin (UW) solution over a cold ischemic time (CIT) of 12 h. The supra- and infrahepatic caval veins had been lengthened with a donor vein interposition. After the second harvesting and preservation with UW solution for over 10 h (Fig. 1), two liver arteries had to be reconstructed by an iliac artery interposition.

Due to a difficult transplantectomy caused by excessive portal hypertension, the recipient operation on 16 October 1995 was prolonged, but successful. Immunosuppression included tacrolimus, azathioprine, and prednisone. Because of the underlying disease,

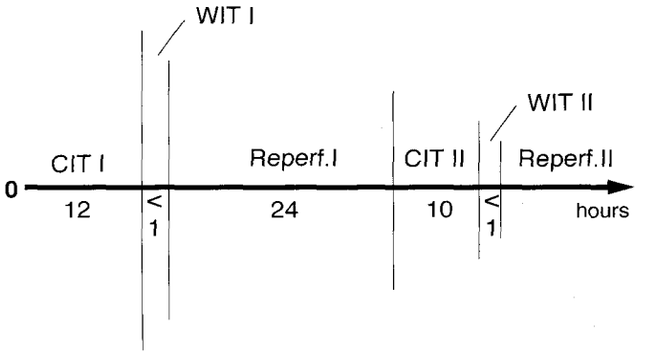

Fig. 1 Ischemic times in the route of the twice transplanted liver graft (*CIT* cold ischemia time, *WIT* warm ischemia time, *I* first transplantation, *II* retransplantation)

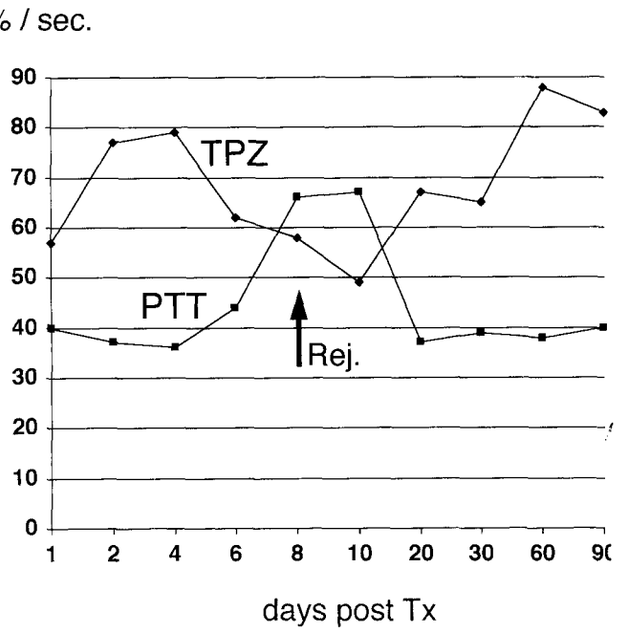

Fig. 2 Course of plasmatic coagulation after re-LTx (*TPZ* Thromboplastin time, *PTT* Prothrombin time, *Rej* rejection)

the patient was continously treated with hepatitis B hyperimmunoglobulins, famcyclovir and, later on, with lamivudine.

The liver enzymes aspartate and alanine transaminase increased to a maximum of 562 and 420 U/l, respectively, postoperatively and decreased to normal values within 20 days. Total bilirubin reached a maximum of 16.2 mg/dl on day 15. The main parameters of liver synthesis stabilized rapidly after the operation (Fig. 2).

A biopsy specimen taken on day O revealed harvesting lesions with a slight portal mesenchymal reaction and cholestasis without major endothelial damage. One episode of acute cellular rejection on day 7 was treated by bolus therapy with methylprednisolone. Further biopsies taken on days 30 and 90 showed no major pathological abnormalities.

On day 40, the patient was discharged from the hospital. Today the patient is well with excellent liver function, and current hepatitis B virus replication is lower than 1.5×10^6 DNA copies/ml.

Discussion

According to a current literature review, this is the second case report on a retransplanted liver graft. In contrast to the Moreno et al. case [5], our liver graft was transferred from one hospital to another. The transplantation followed two prolonged CITs of 12 and 10 h. Despite the tragic outcome of the first recipient (death due to intracerebral bleeding), the possibility of reusing a liver graft was demonstrated.

Obvious prerequisites are that blood groups are identical, organs are not injured, and that there is exact coordination between the exchanging. Requirements for preservation and CIT are the same as in a first transplant. Therefore, the total CIT of 22 h may be borderline. As for the organ's "second" function, it was assumed that the liver graft had become restabilized before being subjected to a second period of ischemia and reperfusion. The minor pathological findings on day O, however, invalidate this assumption. There were only slight increases in postoperative AST and ALT, and liver function was also only slightly reduced, as shown by coagulation activity.

The presence of immunogenic cells originating from four organisms makes this a special immunological situation. Currently, there is no evidence of chimerism or, therefore, tolerance of the second recipient due to the first recipient's immune response [1]. A follow-up of the patient is presently being performed.

The procedure described here should be restricted to individual situations and patients only. However, when faced with an organ shortage, knowing how to reuse a graft may prevent the loss of viable donor organs.

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