ORIGINAL ARTICLE

Thymectomy in Human Renal Transplantation

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Abstract. We reviewed 17 patients submitted to thymectomy via the suprasternal notch (Yoshimatsu Method I), which was performed before transplantation in 12 patients and after transplantation in 5 patients. There were no complications of thymectomy. Graft survival of our patients with thymectomy was better than that for the overall allograft survival in Japan transplant registry for the same period. Pathologic studies revealed that involution of the cortex was not observed in 5 thymuses removed from recipients who had thymectomy after transplantation even though 2 of them had received 6.4 g and 3.5 g of prednisolone for 19 months and 32 months, respectively. (Keio J Med 42 (3): 119–121, September 1993)

Key words: via the suprasternal notch, complication, graft survival, involution of the cortex

Introduction

Because of strong evidence in adult animals that thymectomy can cause delayed loss of immunologic responsiveness, thymectomy has been used as an auxiliary method in the immunosuppression in human transplantation. In man, the chief proponents of thymectomy were Starzl *et al*¹ in Denver, Braun *et al*² in Cleveland and ourselves³ in Japan. We reviewed 17 patients submitted to thymectomy before and after transplantation from 1971 through 1977.

Methods

The thymectomies were performed 6–124 days (average 34 days) before transplantation in 12 patients and 100–967 days (average 478 days) after transplantation in 5 patients, through an incision in the suprasternal notch (Yoshimatsu Method I).⁴ All recipients of living-related allografts, who had a thymectomy before transplantation, had been on chronic hemodialysis and were in a surgical poor risk (Table 1). Immunosuppressive therapy was with azathioprine and prednisolone, given initially in doses of 5 mg and 6 mg/kg/day, respectively.

Results

Although it requires great care to perform a thymectomy in such a patient at a poor risk, Yoshimatsu Method I presented no difficulties. The operations took 70 ± 13 minutes and the blood loss was 11 ± 4 g. There were no complications referable to thymectomy.

In 5 thymectomies removed from recipients who had thymectomy after transplantation, involution of the cortex was not observed even though 2 of them had received 6.4 g and 3.5 g of prednisolone for 19 months and 32 months, respectively.³

It is impossible to compare allograft survival between thymectomized and nonthymectomized recipients because renal transplantation was done without thymectomy only in 6 patients during this same period. However, graft survival of our thymectomized recipients was better than that for the overall allograft survival in Japan transplant registry for the same period (Fig. 1).

Table 1 The Laboratory Data at the Time Pretransplant Thymectomy

Hemoglobin (g/dl)	6.6 ± 1.3
Hematocrit (%)	17.6 ± 4.0
BUN (mg/dl)	42.6 ± 12.4
Serum Creatinine (mg/dl)	12.6 ± 4.5

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Fig 1 Renal allograft survival in our thymectomized recipients and in overall Japan transplant registry.

Fig 2 Twenty-two years post-transplantation course of a thymectomized patient.

Figure 2 illustrates the 22 years post-transplantation course of one patient who had a thymectomy 18 months after transplantation and now has normal function, 22 years and 10 months later. This patient represents the 2nd longest continuously functioning renal graft in Japan and the 17th longest surviving living-related renal graft in the world, as we can determine from UCLA transplant registry.⁵

Discussion

Because of the abundant evidence in rodents that excision of the thymus during the embryonic or early newborn period induces quick loss of their capacity to react against a variety of antigens^{6,7} and that thymectomy in adult mice, rats, and hamsters can cause a slowly devel-

oping loss in immunologic reactivity,⁸⁻¹² Starzl carried out thymectomy as an adjunct in the immunosuppression of human kidney transplantation.¹³ In 1970, Starzl *et al*¹ showed that the homografts in the thymectomized patients had fewer and less severe pathologic lesions. However, they found no clinical evidence that the patients with thymectomy had improvement in survival, in dosage of immunosuppressive drugs, or in renal function. They performed the thymectomies through an incision in the 2nd or 3rd left intercostal space. There were 2 serious complications of thymectomy.¹

Braun *et al*² performed the thymectomies by the transcervical approach. Significantly better allograft survival was found in the combined cadaver and living-related thymectomized recipients and in the thymectomized cadaver recipients.

One of our authors (H.N.) pointed out at the 26th Annual Meeting of the Japan Society for Transplantation that the data of the registry is extremely incorrect and that the actual long-term graft survival is much lower (probably only 2 of 52 reported grafts are functioning at 20 years after transplantation). Our patients are also included in a small number of data of the registry. Whereas it may be clearly speculated that allograft survival was better in the living-related thymectomized recipients.

Although thymectomy had advantage in terms of allograft survival and in pathologic changes in the grafted kidney, it has virtually been abandoned, because most surgeons felt this operation to be too major a procedure to undertake for doubtful benefit. It is too early to deny the possible benefit of thymectomy. It should be recognized that Yoshimatsu Method I is a safe procedure in surgically poor risk patients due to end-stage renal failure. It may be hoped that the renal efficacy of thymectomy should be reevaluated in the near future.

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