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LETTER TO THE EDITOR

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Expanded criteria donors and dual kidney transplantation

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Sir: We read with interest the article by Dafoe and Alfrey [4] reporting on 15 cases of dual kidney transplantation. The improved outcome of renal transplantation over the past 10–15 years, the subsequent extension of recipient criteria, particularly age, and the increasing number of retransplantations have increased the number of patients awaiting renal transplantation. The criteria for suitable donors, in particular older donors, have also been extended. Yet, despite this, the gap between the number of patients awaiting renal transplantation and the total number of transplantations performed is steadily growing. Various attempts have been undertaken to alleviate the organ shortage, including the use of living related and unrelated donors, older and pediatric cadaver donors, and nonheart-beating donors [2, 6, 7, 9, 10]. Dual renal transplantation from a single older donor has been employed to decrease the organ shortage by utilizing kidneys that otherwise would have been discarded [8]. In this report, the background, management, and outcome of such a dual kidney transplantation is described.

The donor was a 73-year-old male patient with intracranial hemorrhage and subsequent clinical brain death. Despite his age, he was considered as an organ donor. Predonation control of renal function at the time of admission to the hospital revealed the following results: 24-h diuresis 3900 ml, blood urea 23 mg%; blood creatinine 0.86 mg%; and urinary sedimentation showing erythrocytes 2 +, leukocytes 2 +, urine protein 1 +, and urine creatinine 23 mg%. The creatinine clearance was 75 ml/min and blood pressure was 160/100 mmHg. There was no evidence of cardiac arrest or hypotension. The patient's blood group was O-negative. Tissue typing revealed HLA A1, A9–23, B17–57, B27, BW4, CW2–6, DR3–17, DR7, DR52–53, and DQ2–3. After completion of the medico-legal issues, a standard multi-organ procurement procedure was carried out with the use of 4 l UW solution for in situ flushing and storage. The liver was successfully used for transplantation. The pancreas was procured for a pancreatic islet isolation program.

Because of matching, the kidneys could not be exchanged in the Eurotransplant exchange program. One available recipient was 10 years old, while a second 20-year-old recipient was highly immunized and eventually showed a positive crossmatch. Finally, the decision was made to transplant these kidneys at our institution into an age-matched recipient of 66 years with a medical history of previous cerebrovascular accident, neuropathy in the lower extremities, and chronic renal insufficiency due to analgesic nephropathy.

The recipient was blood group O-positive, and the HLA typing was A2, B13, B17, B58, BW4, DR7, DR13, DR52, DR53, and DQ6. There was a 2/6 HLA match (AABDR mismatch) between donor and recipient. The surgical procedure was only slightly longer than that of a single kidney transplantation due to the midline laparotomy rather than the extraperitoneal approach and the duplicate vascular and ureteral anastomoses. The cold ischemia time of the left kidney was 21 h 52 min and of the right kidney 22 h 32 min. The anastomosing time of the left kidney was 30 min and of the right kidney 35 min. There was immediate graft function and dialysis was not required. During hospitalization, the patient became positive for PCR CMV but did not develop symptoms. Gancyclovir was administered. Immunosuppression consisted of cyclosporin, azathioprine, and steroids.

The postoperative creatinine clearance and serum creatinine are given in Fig. 1. The patient was discharged from the hospital on the 43th postoperative day.

In times of an organ shortage, the use of expanded criteria donors increases. Single donor grafts, such as liver [11] or kidney grafts, have been used from older donors with acceptable results [7]. The reduction in functional renal parenchyma, caused by arteriosclerotic changes, and the reduction in the number of functional glomeruli can be suspected on pretransplant echography and confirmed by kidney biopsy predonation. Nevertheless, the clinical outcome of these kidneys is frequently not correlated with renal biopsy findings [8]. To improve renal function, both kidneys can be used in one recipient. From a technical point of view, a midline incision with a transperitoneal approach should be used instead of an extraperitoneal implantation as in standard single kidney transplantation. The risk of urological and/or vascular complications is certainly greater with this procedure due to the fact that two kidneys are being transplanted.

The criteria for dual kidney transplantation still need to be defined. In a recent analysis by Alfrey et al. [1], it was found that donor age exceeding 59 years and a donor creatinine clearance of less than 90 ml/min are characteristics that predict delayed graft function. The results, as measured by mean serum creatinine up to 6 months post-transplantation, were better when both kidneys, rather than a single kidney, were transplanted [1]. In addition,

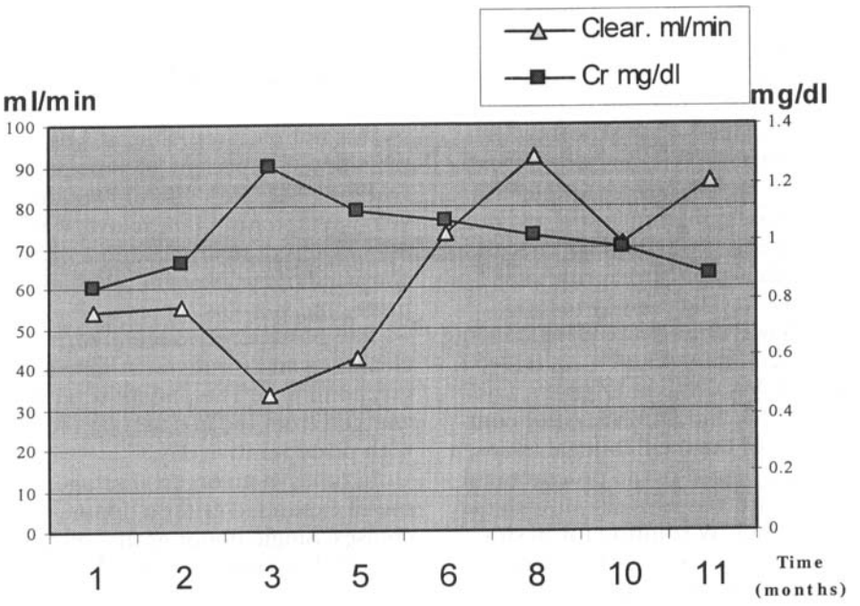

Fig. 1 Serum creatinine and creatinine clearance 1–12 months post-transplant

cold storage exceeding 24 h was associated with a higher incidence of delayed graft function and a higher mean serum creatinine up to 6 months post-transplantation [1]. In other reports [12], cold storage for more than 24 h was found to be a predictor of delayed graft function. In our particular case, we kept the cold storage time to less than 24 h since the admission donor creatinine clearance was 75 ml/min and the donor age was 73 years. As for the importance of age and size-matching for long-term outcome in kidney transplantation [3, 5], it was impossible to find a suitable age-matched or size-matched recipient in the Eurotransplant exchange program.

With these considerations in mind, it appeared most reasonable to perform a dual kidney transplantation in this age-matched patient.

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