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LETTER TO THE EDITORS

Results of kidney transplantation after rescue allocation

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In 2009, Eurotransplant (ET) offered 4026 kidneys from deceased donors. Only 3587 were transplanted resulting in a discard rate of 11% [1]. During the standard allocation, 16% of all renal grafts were refused because of medical reasons. In the case of nonacceptance, ET offers these organs to other centers. If such a renal allograft is also refused for medical reasons by the five further centers consecutively according to the regular allocation system, the process of rescue allocation (RA) is initiated, i.e. the renal allograft is offered as noncompetitive center allocation in the region of explantation (first line-RA) and thus define the allograft to orginate from a donor with extended donor criteria (ECD) [1]. If the organ is declined by all the regional centers, a competitive center allocation in the greater area of explantation starts (second line-RA) until the organ is accepted. Thus, the number of transplanted allografts could be increased. In this manner, 7.5% of the RA-kidneys are discarded ultimately [1,2].

The reasons for the refusal of RA-kidneys are not clear. Attributable factors could include the medical history of the donor, or a ''cascade effect,'' meaning that the refusal itself is an extra factor for the following refusals [3,4]. There are only sparse published data on the outcome of rescue-allocated kidneys.

We evaluated our center experience with kidneys allocated by RA. The records of all patients who received a RA kidney (first or second line) from January 2000 until December 2009 were analysed retrospectively. The main outcome parameters were the graft function according to 1-month and 12-month serum-creatinine and estimated glomerular filtration rate (eGFR), the graft survival and the patient survival. The estimated GFR was calculated according to MDRD-equation[5]. Secondary outcomes were a delayed graft function, acute rejection and the existence of long-time survivors. Data concerning the main outcome parameters were complete.

From January 2000 until December 2009, 16 patients received a rescue-allocated kidney. In the same period, 330 regularly allocated kidneys from deceased donors were transplanted (ratio 4.8%).

The kidneys originated from 13 donors. In three cases, we accepted both organs from the same donor. All donors were heart-beating (i.e. brain-dead on artificial life-support and artificial life-support about to be withdrawn as per advanced directives or per the power of attorney's instructions). The demographic and medical data characterizing the donors are presented in Table 1.

The 16 organs included in our study were refused 108 times by other centers. The mean number of refusal for a single kidney before acceptance was 6.8 ± 2.8 times (median 8.0). The reasons for refusal in 90.7% ($n = 98$) of the cases were because of medical reasons, in 5.6% ($n = 6$) of the cases because of logistical reasons and in the remaining 3.7% ($n = 4$) because the designated recipients were not transplantable.

The 1-month patient survival rate was 100%. In three cases, the kidneys had a macroscopic damage that was not described in the ET-donor report. One graft was lost on the first day after transplantation because of a total venous thrombosis. Three out of the 16 recipients (18.8%) demonstrated delayed graft function. In four out of the 16 allografts, an episode of acute rejection was diagnosed during the postoperative period, which could

Table 1. Demographic and medical characterization of the donors.

Demographic data	Number of kidneys ($n = 16$)
Mean age (years)	60.5 ± 10.3 (median 59)
Gender (male:female)	10:6
Cause of death (CVA:other)	11:5
Last creatinine (mg/dl)	1.4 ± 0.6 (median 1.3)
Last hour diuresis (ml)	228 ± 200 (median 190)
Cardiac arrest (yes:no)	4:12
Body mass index	26.8 ± 4.1
Smoking (yes:no:unknown)	7:8:1
Hypertension (yes:no)	9:7
Diabetes mellitus (yes:no:unknown)	1:14:1
Vasopressor use (yes:no)	15:1
Cold ischemia time (hours)	19 ± 6 (median 18)
ET-report (good:acceptable:no comment)	7:3:6
HLA-A 0:1:2	0:11:5
HLA-B 0:1:2	0:7:9
HLA-DR 0:1:2	6:8:2
Mean mismatches	3.6 ± 1.0

ET, Eurotransplant.

be treated initially successfully with either corticosteroid bolus therapy or anti-thymoglobulin. Two of these patients were sensitized, one with 39% and the other with 90% of panel reactive antibody (PRA). From the four grafts each of which had experienced an acute rejection episode, two lost their function because of uncontrolled rejection and were explanted after 4 and 6 months respectively. Thus, the graft survival was 87% after 6 months and 77% after 12 months. The Kaplan–Meier 5-year graft survival was 65%, with a mean follow-up time of 44.9 ± 33.0 (median 38.5) months. The patient with the longest functioning graft has been transplanted for 101 months with good graft function (serum-creatinine 1.39 mg/dl).

The eGFR for RA-kidney without an acute rejection episode versus RA-kidneys with an acute rejection was 43.0 ± 19.3 ml/min vs. 26.4 ± 18.6 ml/min after 1 month ($P = 0.19$), 42.7 ± 16.9 ml/min vs. 21.4 ± 8.9 ml/min after 12 months ($P = 0.09$) and at the end of follow up 39.7 ± 17.3 ml/min vs. 19.7 ± 5.4 ml/min ($P = 0.02$).

From 16 transplanted organs, nine (56.3%) were allocated as first-line and seven (43.8%) as second-line RAs. The eGFR for the first-line RA-kidney versus second-line RA-kidney was 33.3 ± 18.7 vs. 44.6 ± 21.0 ($P = 0.29$) after 1 month, 37.9 ± 20.7 vs. 40.8 ± 16.1 ($P = 0.79$) after 12 months and 30.5 ± 17.4 vs. 42.0 ± 17.1 ($P = 0.26$) at the end of follow-up. The difference of eGFR between the first-line and second-line RA-kidneys is not significant.

Our evaluation showed that RA-kidneys have an acceptable graft function and therefore can be accepted and beneficial for a selected group of patients. The number of refusals before the kidney transplantation is not related to the graft function. The episodes of acute rejection seem to be of special importance for the graft functions in rescue-allocated kidneys. Fifty percent of the grafts were lost in the first year despite treating the acute rejection episodes successfully in the early stage itself.

Based on our data, we suggest offering RA-kidneys to nonimmunized, middle age patients (50–60 years) with an expected long waiting time. Informed consent of the recipient and meticulous inspection of the kidney by the transplant surgeon are further necessities in RA. The additional risk that the recipient accepts by agreeing to a rescue-allocated kidney is balanced by the reduction in waiting time. The waiting time on dialysis is an important risk factor for graft loss after kidney transplantation[6]. Second, morbidity and mortality increase with each year, justifying the risk of ECD-transplantation after 3.5 years of waiting time [7].

We would like to conclude that carefully selected patients can benefit from the transplantation of these grafts with no further need for dialysis and a higher expected lifetime after transplantation. A systematic evaluation of the ET data base concerning the outcome of these organs would give a better background for the decision to accept or refuse a RA offer.

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