

Introduction and methods

Introduction: Although the population of the kidney transplant recipients with long-term functioning graft has grown, information concerning clinical care and management of this population is lacking.

Patients and methods: A retrospective cohort analysis was conducted on kidney transplantations (Tx) performed at our institution between November 1988 and June 20023. The recipients operated here for this period, excluding those with early graft loss (n = 10), transferred to other hospitals (n =6) and pediatric patients less than 15 years of age (n =2), were enrolled. These patients were followed until the end of the observation period in June 2024. Thirty-nine of 122 recipients enrolled (32.0%) were alive with functioning grafts for 20 years or more. Medical records regarding the recipient and donor demographics, the issues concerning Tx, clinical event following Tx, graft function modulation, and histopathological findings of the graft biopsy just prior to graft failure were collected and analyzed.

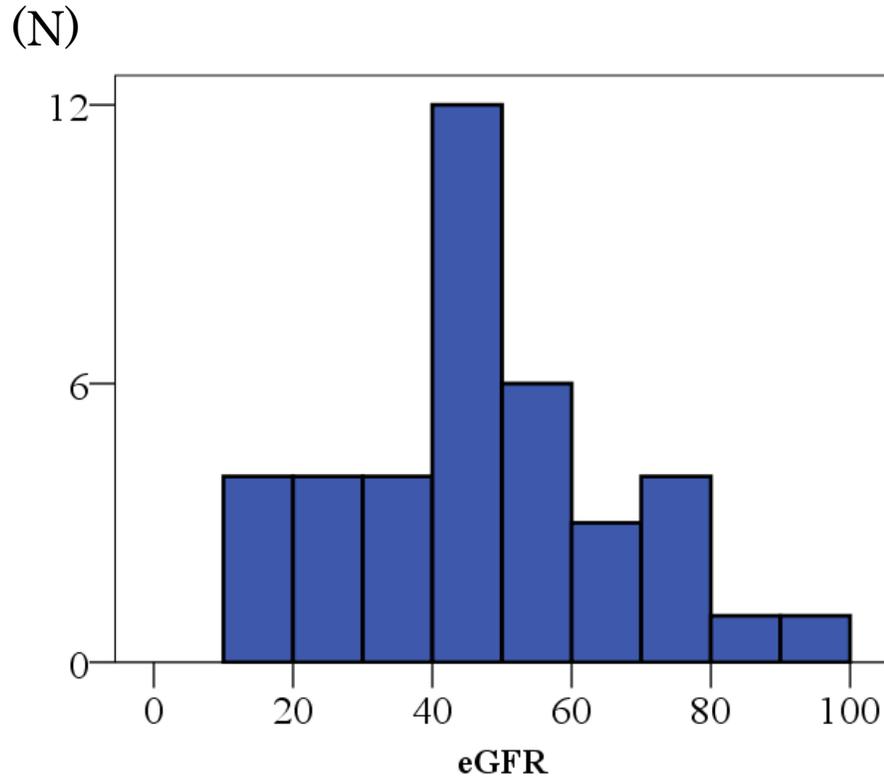
Table 1 Demographic characteristics of 20-year kidney transplant survivors (n = 39)

recipient age at transplantation	34.9 ± 11.7
recipient sex, male/female	18 / 21
cause of end stage renal disease	
glomerulonephritis	25
congenital disease	6
ADPKD	2
diabetes mellitus	1
nephrosclerosis	2
others	3
dialysis periods (months)	48.6 ± 49.8
donor age	45.9 ± 15.2
donor sex, male/female	16 / 23
donor type, living/deceased	29 / 10
HLA mismatches (A,B,DR)	2.2 ± 1.4

ADPKD, autosomal dominant polycystic kidney disease; HLA, human leucocyte antigens

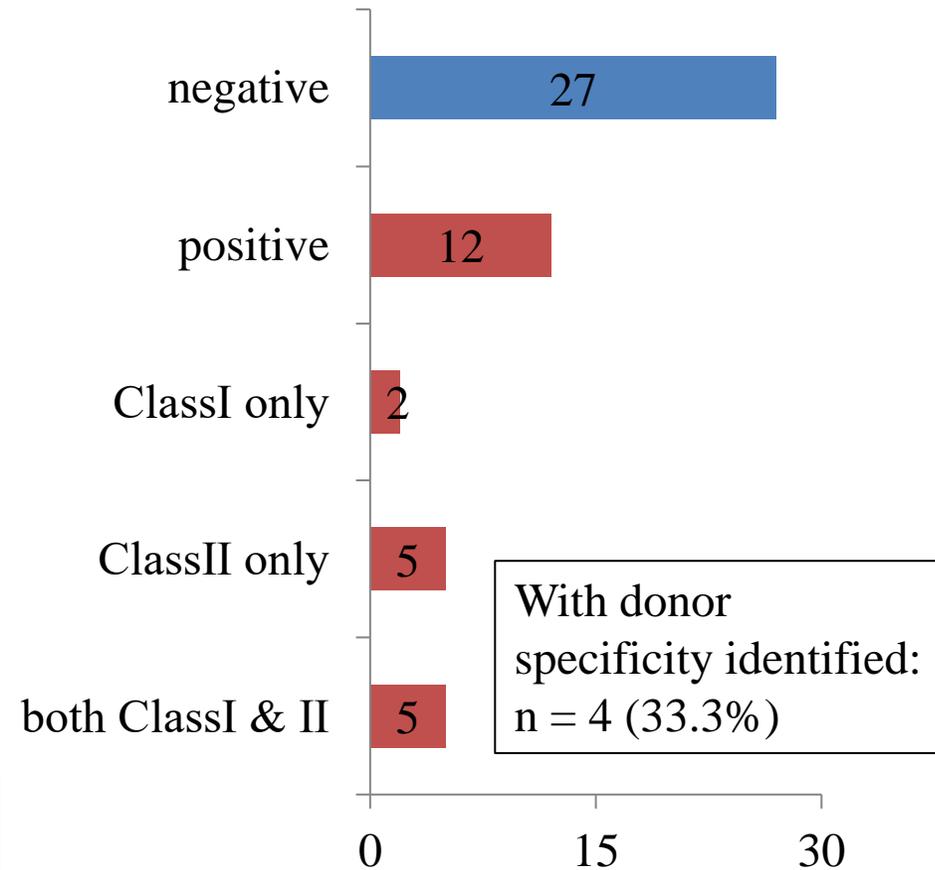
Figure 1 Graft function and anti-HLA antibodies at 20 years after transplantation

A. Graft function (eGFR)



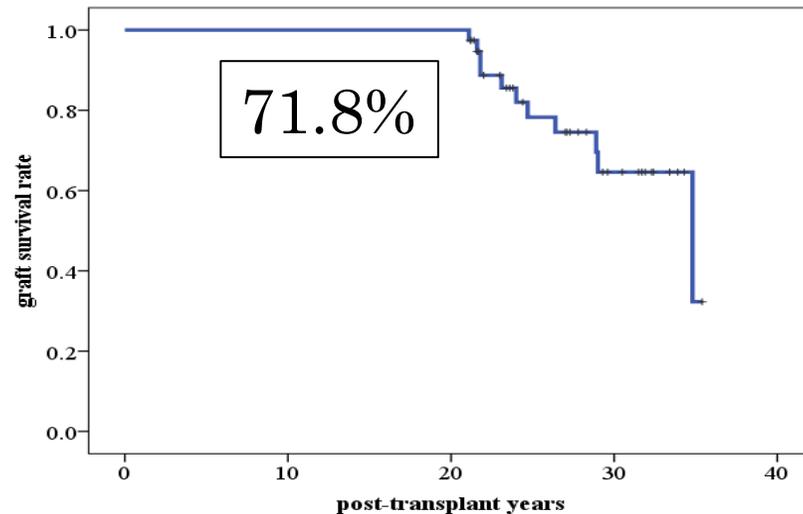
Mean: 46.9 ± 19.0 ml/min/1.73m²
Median: 46.4 (35.8 ~ 54.5) ml/min/1.73m²

B. anti-HLA antibodies



All-caused graft failure during the follow-up time

Figure 3 Death uncensored graft survival



Mean observation periods; 26.9 ± 4.6 years
Median; 27.0 (22.0 ~ 31.5) years

Table 2 Cause of graft failure

Cause of death with functioning graft (n = 4)

infection	2
malignant disease	1
stroke	1

Main pathological finding of the graft before graft failure (n = 7)

IF/TA grade II or III	4
IgA nephropathy	2
c - AMR	1

IF/TA; interstitial fibrosis / tubular atrophy,
c-AMR; chronic active antibody mediated rejection

Table 3 Risk factors for all caused graft failure, the Cox proportional hazard analysis

univariate	reference	hazard ratio	95% confidence interval	p
eGFR at 20 years after transplantation		0.925	0.864 - 0.970	0.003
malignant disease	none	5.14	1.424 - 18.55	0.012
multivariate				
eGFR at 20 years after transplantation		0.929	0.875 - 0.986	0.015
malignant disease	none	2.692	0.679 - 10.747	0.161

Conclusion

Seven grafts in the cohort we studied failed after two decades because of chronic irreversible pathophysiology, glomerulonephritis, or antibody-mediated rejection, although 4 patients died with a functioning graft. Careful monitoring of both patient and graft would be needed to improve graft survival, even 20 years after kidney transplantation.