



Pre-procurement kidney biopsy and donor determinants of six-month recovery of graft function

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Introduction

Kidney transplantation is the renal replacement therapy of choice in ESRD patients. However, there is a shortage of kidneys available for transplantation, due to the increasing incidence of CKD and organ demand as well as a change in donor demographics, with older donors who are more likely to have died from cardiovascular complications. These donors, defined as expanded criteria donors (ECDs) present more frequently preexistent chronic kidney damage. We aimed to investigate the role of pre-procurement graft biopsy and other clinical and analytical parameters on the recovery of graft function of kidneys from ECDs.

Materials and Methods

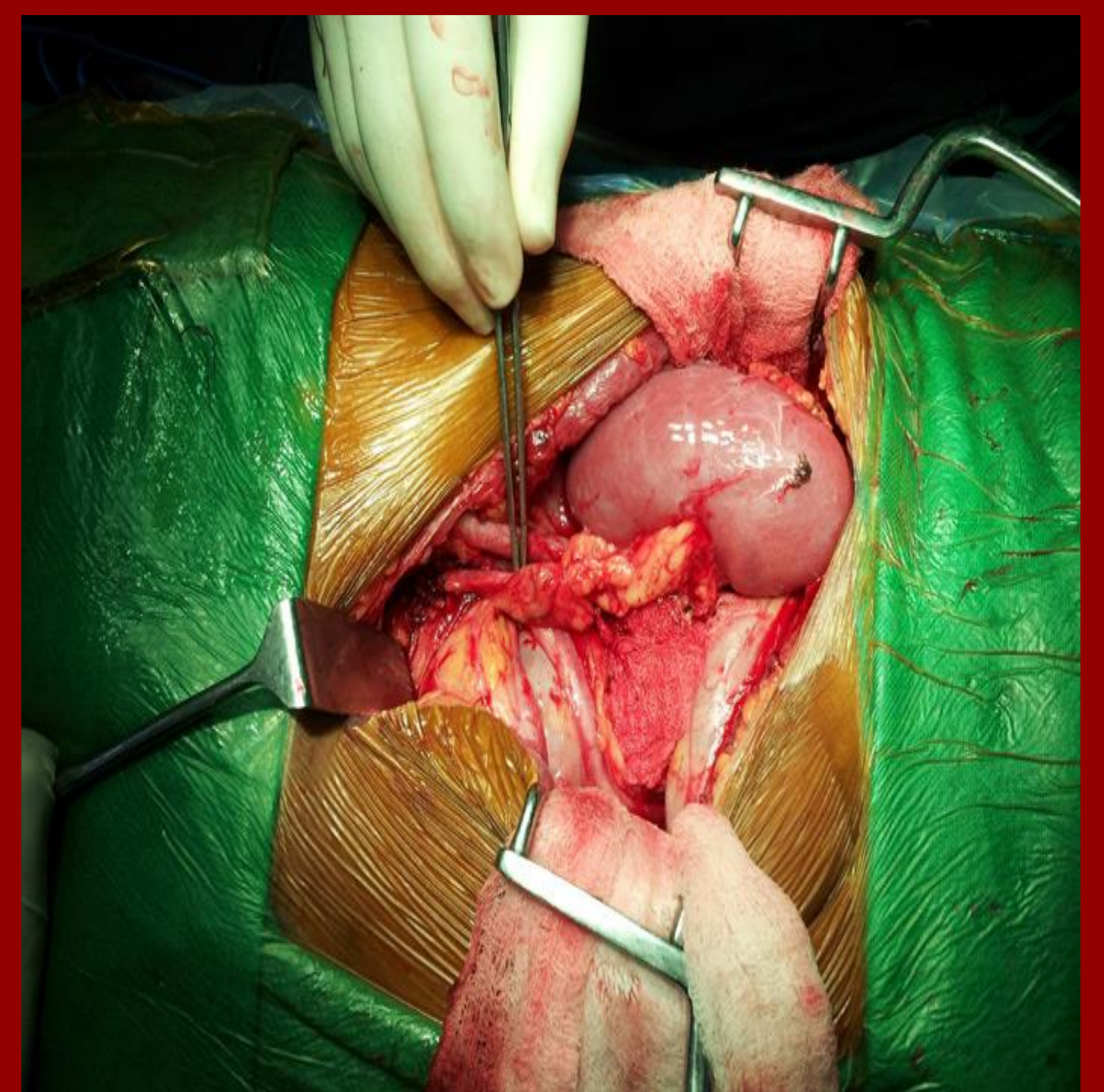
124 cadaveric kidney allografts which had undergone a pre-procurement kidney biopsy were included. ECDs were defined as brain-dead donors aged > 60 years or aged > 50 years with at least two of the following conditions: death resulting from cerebrovascular accident, history of hypertension or terminal serum creatinine level ≥ 1.5 mg/dl. Wedge donor biopsies were evaluated according to Banff classification. Renal function recovery (RFR) was defined as the ratio of recipient eGFR to half the donor eGFR. It was calculated using the average of the best three serum creatinine (SCr) values observed during the first 6 months post-transplant. Donor and recipient eGFR were calculated according to the CKD-EPI equation. We excluded values measured on dialysis days for patients with delayed graft function (DGF). Anthropometric and analytical data was extracted from our hospital's database. Statistical analysis was performed using IBM SPSS Statistics 22.

Results

Table 1 summarizes relevant recipient and donor clinical and analytical data. In univariate analysis RFR correlated negatively with graft biopsy score ($R=-0.311$; $p<0.001$) and positively with pre-transplant daily urine output ($R=0.198$; $p=0.029$) and donor serum urea ($R=0.295$; $p=0.002$). Donor history of dyslipidemia (0.65 ± 0.38 vs 1.03 ± 0.26 ; $p=0.004$) was associated with lower RFR. Stepwise regression analysis included recipient pre-transplant daily urine output, graft biopsy score, donor serum urea and donor history of dyslipidemia as independent predictors of 6-month RFR ($R=0.547$; $p<0.001$).

Table 1

N		Donor Data	
N	124	Age	67,5±7,8
Female Sex, n(%)	36(29)	Female Sex, n(%)	62(50)
Age, years	64,7±8,8	Height, cm	156±39
Kidney Dis. Etiology, n(%)		Weight, kg	74,2±11,5
Diabetes	21(16,9)	Terminal SCr, mg/dl	0,8±0,2
Polycystic Kid Dis	17(13,7)	Terminal Urea, mg/dl	32,7±12,1
Tubulo-Interstitial Dis	21(16,9)	24h Urine Output, ml	2992±949
Glomerulonephritis	31(25)	Hypertension, n(%)	58(46,8)
Others	12(9,7)	Diabetes, n(%)	22(17,7)
Unknown	23(18,5)	Dyslipidemia, n(%)	22(17,7)
Dialysis Modality, n(%)		Cardiovascular Dis, n(%)	16(12,9)
Hemodialysis	88 (71)		
Peritoneal Dialysis	36 (29)	Pretransplant 24h Urine Output, ml	911±844
Cardiovascular Risk Factors, n(%)		HLA Matching	1,8±0,8
Hypertension	115(92,7)	Total Biopsy Score	2±0,9
Diabetes	29(23,4)	6-month avg SCr, mg/dl	2,22±1,64
Dyslipidemia	65(52,4)	DGF, n(%)	22(17,7)
Ischemic Heart Dis	14(11,3)	Urologic Complication, n(%)	25(20,2)
Stroke	10(8,1)	RFR, ratio	0,95±0,55
Peripheral Arterial Dis	11(8,9)		
Dialysis Vintage, months	28,8±33		



Conclusions

Pre-procurement graft biopsy score, as well as other donor clinical and analytical parameters such as previous history of dyslipidemia or terminal serum urea are independent predictors of 6-month renal function recovery. Recipient pre-transplant daily urine output is also associated with 6-month renal function recovery.

