

# Surgical revisions and efficiency of Dual Kidney Transplantation compared to Single Kidney Transplantation from expanded criteria donors: a single center experience

Mendel.L<sup>a</sup> ; Yandza.T<sup>a</sup>, Albano.L<sup>b</sup>, Jourdan.J<sup>a</sup>, Quintens.H<sup>a</sup>, Tibi.B<sup>a</sup>, I. Bentellis<sup>a</sup>, Durand.M<sup>a,c</sup>, Amiel.J<sup>a</sup>, Chevallier.D<sup>a</sup>

<sup>a</sup>Urology, andrology and transplantation department, Nice UH, Nice-Sophia-Antipolis University, France

<sup>b</sup>Nephrology department, Nice UH, Nice-Sophia-Antipolis University, France

<sup>c</sup>INSERM, U1189, ONCO-THAI, F-59037 Lille, France

## Objective:

Dual Kidney Transplantation (DKT) is one of the strategies that aim to address the graft shortage in elderly recipients. However, the efficacy and safety of that technic are still debated. This retrospective study in a single center aimed to compare the outcome of DKT and single kidney transplantation (SKT) performed with grafts from expanded criteria donors (ECD), with a special focus on surgical complications.

## Material and Methods:

All kidney transplantations (KT) performed between February 2006 and June 2014 at the University Hospital of Nice were analyzed. Indication for DKT was based on the BIGRE criteria protocol, led by the French national Agence de la Biomedecine. The results of DKT were compared to those of SKT performed with ECD kidneys grafted in recipients  $\geq 65$  years. Demographic characteristics, waiting times before KT, intra and peri-operative data, rate of surgical revisions and functional outcomes were collected. The primary endpoint was the rate of early ( $\leq 1$  month) surgical revisions. Student-t test, Mann-Whitney and  $\chi^2$  tests were used with an alpha risk 5% to analyze quantitative and qualitative variables.

## Results:

Thirty-nine DKT and 155 SKT were included, with a median follow-up of 36 and 26.5 months, respectively [Table 1]. The median waiting time before DKT was shorter (2.79 months vs 5.95;  $p=0.01$ ). The rate of early surgical revisions was not significantly higher after DKT (23.1% vs 15.5% ( $p=ns$ ))[Table 2] but more venous graft thromboses and intraoperatively transfused blood units (12.8% vs 3.2% ( $p=0.02$ ) and  $0.77 \pm 0.99$  vs  $0.40 \pm 0.88$  ( $p=0.01$ )) were reported. Overall, 19 patients (48.7%) needed a surgical revision in the DKT group versus 52 (33.6%) in the SKT group ( $p=0.08$ ) including 6 (15.4%) explantations of a single graft in the DKT group, versus 12 (7.7%) in the SKT group ( $p=0.14$ ). The glomerular filtration rate (GFR) 24 months after KT was significantly higher after DKT ( $45.0 \pm 16.3$  vs  $39.8 \pm 13.8$  mL/min/1.73m<sup>2</sup>;  $p=0.04$ ) [Table 3] with comparable graft survivals in both groups until 48 months.

**Table 1. Waiting times, Intra-operative and peri-operative outcomes.**

DKT: dual kidney transplantation, SKT: single kidney transplantation, SD: standard deviation, K1: first kidney transplanted in DKT, K2: second kidney transplanted in DKT.

Cold ischemic time was significantly lower in SKT when compared to the second kidney transplanted (K2) in DKT. The operating time was significantly longer in DKT but no difference was found regarding the hospitalization length after transplantation.

**Table 2. Surgical complications of DKT compared to SKT.**

DKT: dual kidney transplantation, SKT: single kidney transplantation.

No significant difference was found regarding the rate of early revisions. The only significant differences reported concerned graft venous thrombosis and blood units transfused intra and post-operatively, both higher in DKT.

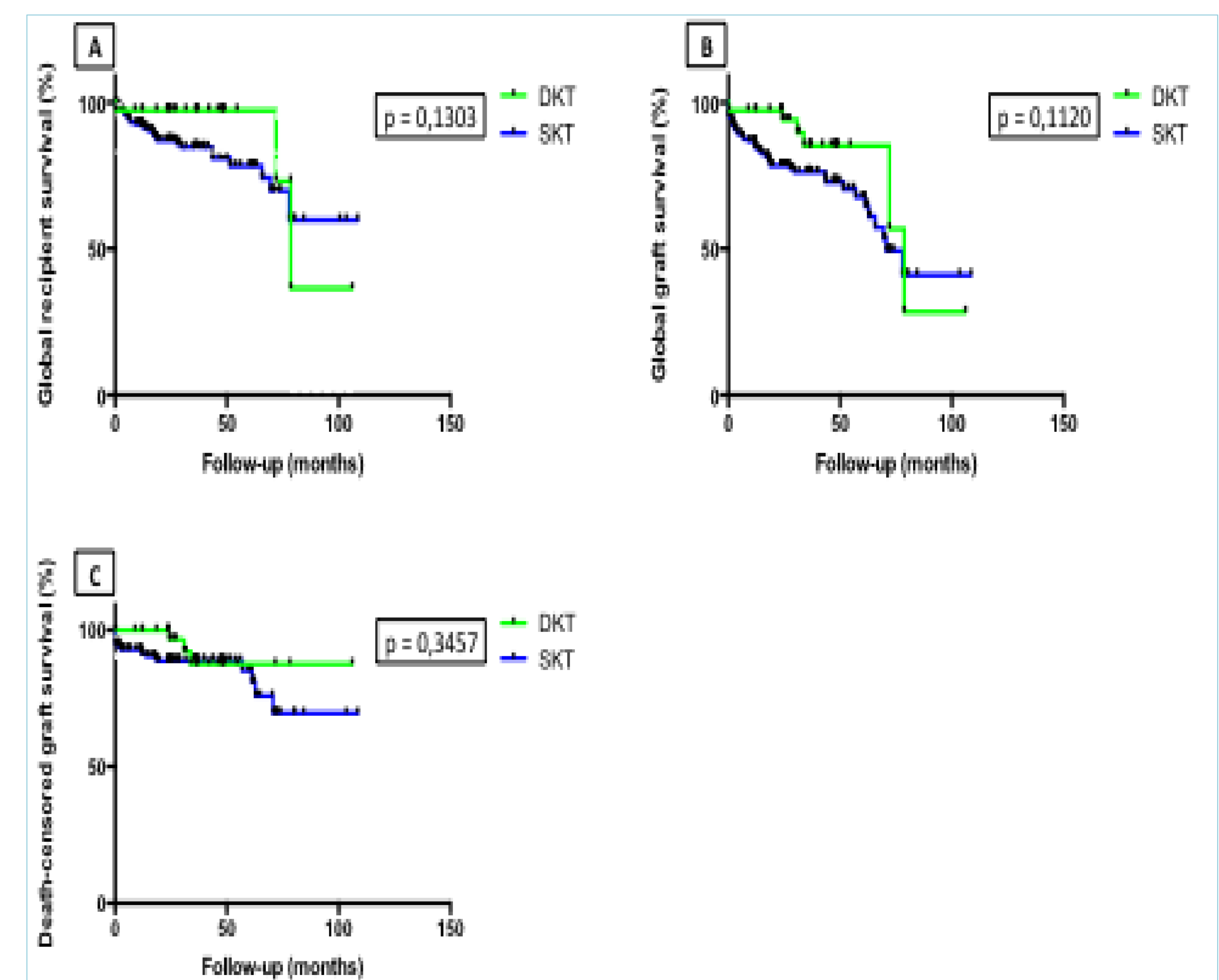
**Table 3. Renal function of DKT compared to SKT.**

DKT: dual kidney transplantation, SKT: single kidney transplantation, GFR: glomerular filtration rate.

No significant difference was found regarding delayed graft function rates, but DKT presented better functional outcomes in term of serum creatinine and GFR from 1 month (M1) to 24 months (M24) after transplantation.

	DKT (n=39)	SKT (n=155)	P	
Median waiting time (months)	2.79	5.95	<b>0.0022</b>	
Ischemia time (min $\pm$ SD)	Cold	K1	1098 $\pm$ 242	ns
		K2	1160 $\pm$ 257	<b>0.0323</b>
	Warm	K1	44.8 $\pm$ 16.2	ns
		K2	42.3 $\pm$ 11.9	ns
Mean operating time (min $\pm$ SD)	239.8 $\pm$ 58.2	163.7 $\pm$ 41.5	<b>&lt; 0.0001</b>	
Median length of hospital stay (days)	18	18	ns	

	DKT (n=39)	SKT (n=155)	P		
Surgical complications	Ureteral	Stenoses	4 (10.3%)	15 (9.7%)	ns
		Fistulas	1 (2.6%)	3 (1.9%)	ns
		Plasties or reimplantations	0 (0%)	13 (8.4%)	0.0612
	Vascular	Arterial stenoses	3 (7.7%)	9 (5.8%)	ns
		Arterial thromboses	0 (0%)	2 (1.3%)	ns
		Venous thromboses	5 (12.8%)	5 (3.2%)	<b>0.0154</b>
	Hemorrhagic	Hematomas	6 (15.4%)	34 (21.9%)	ns
		Intraoperative RBC (mean $\pm$ SD)	0.77 $\pm$ 0.99	0.40 $\pm$ 0.88	<b>0.0073</b>
		Postoperative RBC (mean $\pm$ SD)	2.62 $\pm$ 2.50	1.95 $\pm$ 2.56	<b>0.044</b>
	Surgical revision for bleeding	3 (7.7%)	17 (11.0%)	ns	
	Drained lymphoceles	2 (5.1%)	5 (3.2%)	ns	
	Drained abscesses	0 (0%)	2 (1.3%)	ns	
	Eventrations	3 (7.7%)	8 (5.2%)	ns	
	Transplantectomies	early	5 (12.8%)	9 (5.8%)	0.1303
late		1 (2.6%)	3 (1.9%)	ns	
Total		6 (15.4%)	12 (7.7%)	0.1414	
Early surgical revisions	9 (23.1%)	24 (15.5%)	ns		
Total surgical revisions	19 (48.7%)	52 (33.6%)	0.0788		
Deaths directly related to transplantation	1 (2.6%)	4 (2.6%)	ns		



## Conclusion:

In our cohort, DKT provides comparable functional outcomes to SKT in recipients  $\geq 65$  years old, and allows shorter waiting time on list without an increased risk of surgical revision, excepted for venous graft thrombosis, more frequent after DKT. Graft survivals were similar and GFR higher in the DKT. Thus, DKT seems to remain an appropriate strategy to address the growing graft shortage in elderly patients, even if our results have to be confirmed by a larger prospective study.