

Influence of Surgical Complications on Kidney Graft Survival in Recipients of Simultaneous Pancreas Kidney Transplantation

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ABSTRACT

Purpose. Simultaneous pancreas-kidney transplantation is the gold standard treatment for patients with end-stage renal failure secondary to insulin-dependent diabetes mellitus. This kind of transplantation is a complex operation associated with a high incidence of surgical complications and mortality risk which could influence graft survival. The aim of this study was to establish the influence of different grades of postoperative complications, classified according to Clavien-Dindo, on the rate of kidney graft loss.

Methods. We performed an observational retrospective review of all simultaneous transplantations performed between February 1989 and May 2012. Factors examined were related to recipient and donor characteristics, surgical procedures, and postoperative outcomes. For this purpose, Kaplan-Meier analyses and Cox-Regression tests are used.

Results. One hundred thirty-nine transplantations were performed. Complications grades I, II, and IIIa were experienced in 81 (58.3%) patients, and grades IIIb and IVa-b in 55 (39.6%). Multivariate analysis showed an influence of panel reactive antibody (hazard ratio [HR]: 10.79; $P = .003$), incidence of acute rejection (HR: 2.55; $P = .03$), and complications grouped into grades IIIb and IVa-b (HR: 3.63; $P = .02$). Kaplan Meier analysis showed worse kidney graft survival rate in groups grades IIIb and IVa-b compared to grades I, II, and IIIa (86.6% vs 98.7% at 1 year and 81.8% vs 97.3% at 5 years; $P = .001$).

Conclusions. Despite being the gold standard treatment for these patients, pancreas and kidney transplantations have numerous complications which could influence the prognosis of graft kidney survival.

SIMULTANEOUS PANCREAS-KIDNEY TRANSPLANTATION (SPKT) is the gold standard treatment for patients with end-stage renal failure secondary to insulin-dependent diabetes mellitus [1]. SPKT compared with cadaveric kidney transplantation alone is associated with better long-term patient survival rates [2]; however, SPKT is a complex operation associated with a high incidence of surgical complications and mortality risk [3]. A number of risk factors have been described for patient and graft survival associated with donor, recipient, immunologic, immunosuppressant therapy, and surgical outcome [3–5]. Several investigators have described the negative

influence with postoperative complications in SPKT forecast, although most of them focus on pancreas graft prognosis, with which the majority of complications are associated [6]. There is little and controversial literature about the influence of these complications in graft kidney medium and long-term prognosis [7,8].

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Table 1. Description and Comparison of Clinical Variables Depends on the Severity of Grade of Complication Grouped in Clavien Grades I (n = 48); II (n = 25); IIIa (n = 9) Compared to Clavien Grades IIIb (n = 41); IV (n = 13); V (n = 3)

Variable $\mu \pm SD$; N (%)	Clavien I; II; IIIa (n = 82)	Clavien IIIb; IVa-b; V (n = 57)	P Value	Total
Receptor variable				
Gender male	61 (75.3)	45 (77.6)	.76	106 (76)
Age (y)	37.85 \pm 6.63	39.16 \pm 7.98	.18	38.50 \pm 7.24
HTA (yes)	27 (33.3)	19 (32.8)	.94	46 (33.1)
BMI (kg/m ²)	23.17 \pm 2.92	23.26 \pm 2.75	.85	23.1 \pm 2.84
Diabetes (mo)	292.43 \pm 73.51	298.53 \pm 77.38	.63	294.98 \pm 74.3
Dialysis				
Predialysis	7 (8.6)	5 (8.6)	1	12 (8.6)
Dialysis (mo)	18.33 \pm 18.60	20.19 \pm 22.86	.58	19.11 \pm 20.43
Peritoneal dialysis*	15 (20.3)	13 (24.5)	.57	28 (22)
Transplantation variables				
Cold ischemia (hours)	12.10 \pm 3.25	13.49 \pm 3.17	.01	12.68 \pm 3.28
Enteric derivation	71 (87.7)	46 (79.3)	.18	117 (84.2)
Days to discharge	26.73 \pm 19.51	50.86 \pm 31.23	.00	36.80 \pm 27.68
Immunological variables				
Immunosuppression [†]	58 (74.4)	32 (60.4)	.09	90 (68.7)
HLA incompatibilities	4.65 \pm 1.00	4.89 \pm 1.28	.33	4.75 \pm 1.12
PRA (<10%)	75 (92.6)	52 (89.7)	.54	127 (91.4)
N° Rejections/patient	0.17 \pm 0.44	0.21 \pm 0.40	.64	0.19 \pm 0.43
DGF (yes) [‡]	8 (9.9)	19 (32.8)	.00	27 (19.4)
Donor variables				
Gender male	55 (67.9)	38 (65.5)	.79	93 (66.9)
Age (years)	26.19 \pm 9.30	26.96 \pm 9.88	.63	26.51 \pm 9.52
BMI (kg/m ²)	23.53 \pm 2.47	23.74 \pm 2.41	.64	23.61 \pm 2.44
ICU (days)	2.91 \pm 2.82	3.09 \pm 4.48	.80	2.98 \pm 3.55
Creatinine (mg/dl)	0.85 \pm 0.29	0.85 \pm 0.35	.80	0.85 \pm 0.31
Inotropic Drugs (yes) [§]	56 (69.1)	44 (75.8)	.40	100 (71.9)
Cause of death (TCE)	46 (56.7)	29 (50.0)	.50	75 (53.9)

Abbreviations: BMI, body mass index; PRA, panel reactive antibodies; DGF, delayed graft function (dialysis in the first week after transplantation); ICU, intensive care unit; HTA, hypertension; TCE, Head trauma.

*Among the patients in dialysis (n = 127).

[†]Basiliximab + tacrolimus-based immunosuppression (9 dates missing).

[‡]Dialysis in the first week after transplantation.

[§]Drugs with α -adrenergic effect.

Other problems exist in the variability and subjectivity of the selection of the nomenclature of such complications, making it very difficult to standardize and compare series. In 1992, Clavien and Dindo [9] presented a novel approach to rank complications by severity based on the therapy used to treat them. This system was revisited in 2004, and the authors developed a new five-scale classification system with the aim of presenting an objective and reproducible way of reporting negative events after surgery. Recently this classification has been evaluated providing strong evidence that this method is valid and applicable in many fields of surgery, including urology and solid organ transplantation [10,11]. The aim of our study was to establish the influence of different grades of post-operative complications, classified according to Clavien-Dindo, on the rate of kidney graft loss.

METHODS

An observational retrospective study was performed of all SPKT in type I diabetes patients performed at the Reina Sofia University Hospital between February 1989 and May 2012. Data from paper and electronic medical records were incorporated to an assembled

transplantation database complying with Spanish law regulating the confidentiality and protection of clinical data.

Patient demographics, donor characteristics, immunosuppressant therapy, immune parameters, and surgical details were recorded. All patients were reviewed in our center until death or the date of last follow-up examination.

Surgical complication was defined as any deviation from the normal postoperative course with the need for pharmacological or invasive treatment. Intra-abdominal infection (IAI) was diagnosed on the basis of clinical symptoms (fever); analytical (leukocytosis and increased serum C-reactive protein level); microbiological examination of blood, pus, or drained liquid; and abdominal collection imaging with computed tomography.

Pancreas graft failure was defined as the permanent requirement for exogenous insulin after transplantation, and kidney graft failure was defined as the permanent requirement for dialysis after transplantation, or in the case of a pre-dialysis patient, a return to their pretransplantation renal function.

The severity of complications was classified according to the modified Clavien-Dindo classification, recording only the most severe complication when patients developed others; grade I, no complication; grade II, drug therapy; grade IIIa, invasive intervention without general anesthesia; grade IIIb, invasive intervention requiring general anesthesia; grade IVa, life-threatening

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