Best Option for Transplant Candidates with Type 1 Diabetes and a Live Kidney Donor: A Bird in the Hand is Worth Two in the Bush

Peter P. Reese* and Ajay K. Israni†

*Renal, Electrolyte and Hypertension Division, Department of Medicine, and Leonard Davis Institute of Health Economics, University of Pennsylvania, Philadelphia, Pennsylvania; and †Division of Nephrology, Department of Medicine, Hennepin County Medical Center, and Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota

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For patients with type 1 diabetes complicated by ESRD, kidney transplantation prolongs life and frees the recipient from the substantial morbidities of dialysis. Live-donor kidney transplant (LDKT) and simultaneous pancreas-kidney transplant (SPKT) offer distinct benefits over receiving a deceased-donor kidney transplant (DDKT) alone. When a transplant physician is counseling a patient who has type 1 diabetes and ESRD and has a live donor, the decision about whether to proceed with LDKT or to remain on the waiting list for an SPKT requires careful consideration. The retrospective study by Young et al. (1) in this issue of CJASN provides an updated look at posttransplantation outcomes that illustrates the relative advantages of LDKT versus SPKT. Their findings support the adage that a bird in the hand may be worth two in the bush.

The comparison of LDKT and SPKT requires scrutiny of mortality and health-related quality of life, as well as differences in the patients who are candidates for each therapy. The excellent outcomes in patient and allograft survival with LDKT result from minimization of organ ischemia, the ability to optimize recipient health before surgery, and also from overt and subtle differences between those fortunate enough to have a live donor and those who are not. LDKT recipients enjoy decreased rates of delayed graft function, prolonged allograft survival, and longer life compared with DDKT recipients (2). LDKT recipients are often able to undergo transplantation before initiating dialysis (3). Comorbidities such as cardiovascular disease can be carefully treated before the scheduled surgery, which may decrease perioperative morbidity. For all of these reasons, transplant programs have increased the volume of LDKT in the past decade through a variety of methods, including promoting laparoscopic nephrectomy, developing donor exchange programs, and pushing the envelope regarding acceptance of older donors and those with comorbidities such as hypertension (4–7). The exceptional results with LDKT probably also stem from important sociodemographic differences between transplant candidates with a live donor versus those without one. For instance, LDKT recipients are less likely to be black (8) and may also have higher income than patients who receive a DDKT (9). These differences must be kept in mind when evaluating why observed LDKT outcomes are consistently better than those after DDKT.

Successful pancreas transplantation can dramatically improve health-related quality of life by relieving the recipient of the burdens of insulin therapy and the risks for severe hypoglycemic events that accompany erratic glycemic control. Pancreas transplantation may also improve diabetic microvascular complications such as neuropathy (10), but previous studies have not provided consistent evidence that the SPKT approach prolongs life compared with LDKT. For instance, a retrospective cohort study using United Network for Organ Sharing (UNOS) data by Reddy et al. (11) showed no significant difference in mortality among LDKT and SPKT recipients by 8 yr after transplantation (unadjusted survival 72% at 8 yr in each group). A more recent analysis of nonconsecutive LDKT and SPKT recipients whose results were voluntarily reported to the Collaborative Transplant Study reported that patient survival was better for SPKT recipients compared with LDKT recipients only after 10 yr, when analyses were adjusted for baseline cardiovascular risk (hazard ratio 0.55; 95% confidence interval 0.36 to 0.83; \( P = 0.005 \)). The authors of the Collaborative Transplant Study hypothesized that better life expectancy among SPKT recipients after a decade of follow-up was a result of long-term glycemic control (12).

Eligibility criteria for SPKT must also be examined when comparing results with LDKT and DDKT. Compared with kidney transplant alone, SPKT is associated with a higher rate of morbidities, including cardiac complications, and postoperative infections that candidates must be hardy enough to endure (13,14). Adults considered for SPKT may undergo more extensive cardiovascular screening and may be considered in-
eligible if significant cardiac or peripheral vascular disease is present (12,15,16). In addition, some transplant centers use recipient age as a criterion for pancreas transplantation to minimize the risk for adverse cardiac events (16,17).

The retrospective study by Young et al. in this issue used data from UNOS to examine posttransplantation outcomes for adult kidney and kidney-pancreas recipients in the United States. Compared with SPKT recipients, LDKT recipients had better death-censored kidney allograft survival (hazard ratio 0.71; 95% confidence interval 0.61 to 0.83; $P < 0.001$). Because unadjusted mortality curves crossed by 5 yr, however, it is difficult to draw a meaningful conclusion from this study about long-term differences in patient survival between SPKT and LDKT recipients.

For the clinician evaluating transplant options for a candidate with type 1 diabetes and a live kidney donor, this study by Young et al. illuminates the advantage in allograft survival that LDKT recipients enjoy. In considering the circumstances of an individual candidate, the transplant team will need to weigh whether the benefits of better glycemic control favor a pancreas transplant (simultaneously or sequentially). In addition, the team must assess whether the patient’s cardiovascular health is adequate and whether the patient is willing to accept the added perioperative risks of pancreas transplant surgery. If the transplant candidate is fortunate enough to have the “bird in the hand” of an appropriate live donor, then LDKT should be pursued. Patients who receive an LDKT can later opt for a sequential pancreas transplant (or in some centers a pancreatic islet transplant). Such decision making requires integration of health-related quality of life, morbidity, and personal preferences, none of which is easily addressed by registry data provided by UNOS.

As kidney and pancreas transplantation research continues to innovate, further studies will be important to match candidates to the best modality. Notably, Young et al. did not examine mortality outcomes for individuals who had type 1 diabetes and remained on the waiting list. A study of mortality from the time of placement of the waiting list for all candidates with type 1 diabetes (rather than just transplant recipients) could provide insight into the cumulative risks of electing to wait for an SPKT compared with opting for an LDKT. In addition, long-term follow-up studies of SPKT recipients that assess the impact of better glycemic control on comorbidities and renal allograft survival will be valuable for better understanding of the range of benefits related to receiving a pancreas transplant. In the meantime, given ever-longer wait times for deceased-donor organs, this new study by Young et al. should encourage patients with type 1 diabetes and a live donor to pursue LDKT.

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References
