Justifying a Third Pancreas Transplant: a Case Report

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Abstract

Early pancreas graft failure after simultaneous pancreas-kidney transplant can occur in up to 20% of recipients. Results after pancreas retransplant continue to improve, with results comparable to primary pancreas transplants. We describe an unusual case of a third pancreas transplant in which a remnant of a previous arterial Y-graft was used for the arterial anastomosis, and we discuss the factors used to justify the decision to do a third pancreas transplant.

Simultaneous pancreas-kidney transplant is the most common type of pancreas transplant and is currently the treatment of choice for patients with insulin-dependent type 1 diabetes mellitus and end-stage renal failure (1). However, up to 20% of patients will lose the pancreas graft with a functioning kidney graft within the first 12 months of surgery (2). For simultaneous pancreas-kidney transplant recipients experiencing early technical failure of the pancreas graft, pancreas retransplant is a good option, providing graft survival rates of more than 70% at 1 year (3, 4). Third-time pancreas transplants are rare and are associated with a diminished 1-year survival rate of less than 50% (4).

We describe the unusual case of a successful third pancreas transplanted in a patient with life-long type 1 diabetes who had previously undergone a simultaneous pancreas-kidney transplant followed by pancreas retransplant, who had had early graft failure on both prior occasions.

Case Report

The patient was a 53-year-old man with type 1 diabetes mellitus. The diabetes had begun when the patient was 15 years old and had required exogenous insulin for the subsequent 38 years. At age 44, he developed end-stage renal failure due to diabetic nephropathy and began peritoneal dialysis. He also had diabetic retinopathy, hypertension, neuropathy (both peripheral and autonomic), and had undergone a coronary artery angioplasty for early onset coronary artery disease. There was no history of peripheral vascular or cerebrovascular disease. Despite good compliance with the insulin regimen, his diabetic control was brittle, with documented hypoglycemic and hyperglycemic events.

After a full work-up for the transplant including careful investigation of cardiopulmonary reserve, the patient was considered to be a good candidate for a simultaneous kidney-pancreas transplant and at age 47 underwent a deceased-donor simultaneous kidney-pancreas transplant. The organs were procured by a nonlocal surgical team, and on inspection before the transplant, the pancreas was considered to be of marginal quality. At the time of the transplant, although the deceased-donor kidney transplant was successful, the on-table perfusion of the pancreas was poor, and thromboses appeared in the graft. The pancreas was therefore removed as part of the index simultaneous kidney-pancreas transplant procedure. The patient made a successful recovery, with stable renal function, without the need for dialysis. The patient's baseline creatinine level was 100 μmol/L. Because of the potential benefits of normoglycemia to the patent's quality of life, he was considered for a pancreas retransplant and was put back on the waiting list.

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Within 12 months, a deceased-donor organ became available, and the patient underwent a pancreas retransplant. Although the pancreas graft appeared to be of reasonable quality before the transplant, a thrombosis occurred in the graft within 24 hours, and the patient underwent an immediate graft pancreatectomy. The patient recovered, maintaining good renal function, but continued to have problems related to his diabetes. Because early technical failure had occurred in both prior pancreas transplants, after careful consideration of the associated risks and thorough investigation to ensure preservation of the underlying cardiopulmonary reserve, the patient was offered a third transplant.

Four years after the second pancreas transplant, a third graft for pancreas transplant was obtained by a local pancreas procurement team based at our institution. During preoperative bench work, the portal vein was reconstructed using an iliac vein extension graft, and an iliac arterial Y-graft was used to reconstruct the superior mesenteric and splenic artery axis. The operative procedure was done using an intraperitoneal approach. Because of previous exposures, there was extensive scarring surrounding the right common and external iliac arteries. Using careful dissection, an oversewn remnant of a previous arterial Y-graft was identified in an end-to-side configuration on the right common iliac artery. Dense adhesions precluded safe isolation of the common iliac vein, and the inferior vena cava was therefore isolated just above the iliac bifurcation.

Using Satinsky clamps to control the arterial Y-graft remnant and inferior vena cava, the portal vein reconstruction was anastomosed end-to-side to the inferior vena cava, and an end-to-end anastomosis was used to join the newly reconstructed arterial Y-graft onto the previous arterial Y-graft remnant (Figure 1). The duodenal cap was anastomosed to the jejunum, allowing enteric drainage. The functioning kidney graft in the left iliac fossa was left undisturbed during the operation. The operation time was 4 hours, and the patient lost an estimated 500 mL of blood.

The patient made a successful recovery and remained off insulin throughout the postoperative period. He was discharged on the 14th day after the transplant and instructed to continue his previous immunosuppressive regimen of tacrolimus and mycophenolate mofetil with additional oral prednisolone. At the time of this writing, which was 3 months after the transplant, the patient was well and insulin independent when followed up at our outpatient clinic.

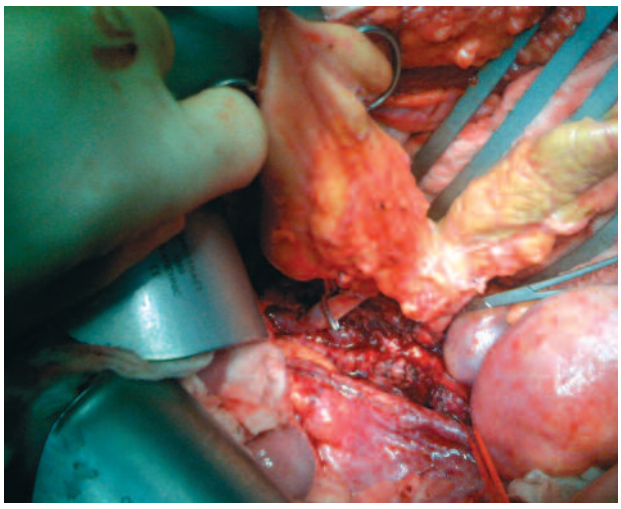

Figure 1. Third-time pancreas transplant in situ, demonstrating an end-to-side anastomosis between the portal vein reconstruction and the inferior vena cava (left), and an end-to-end arterial anastomosis to a previous arterial Y-graft remnant (right), with the pancreas graft above.

Discussion

Although concerns have been made about the risks of pancreas retransplant (3), at experienced centers, the procedure is justifiable in select patients (4). Our main considerations when assessing the risks and benefits of a third pancreas transplant in the same patient include the overall indications for pancreas retransplant, the causes of the failed pancreas grafts, the patient's overall fitness, any associated morbidity and mortality risks, and finally, the patient's choice.

The indications for another pancreas transplant in this patient were numerous owing to progressive, multiple, secondary diabetic complications, and poor diabetes control. Both of the previous pancreas grafts failed owing to early thromboses, possibly due to marginal pancreas factors on at least 1 occasion. Both failed grafts were removed within 24 hours, in the absence of intra-abdominal infection (which is recognized as a major independent risk factor for failure of pancreas retransplants) (5).

We anticipated a major intra-abdominal procedure, and so, we were careful to fully reassess the overall cardiopulmonary reserve of the patient, including repeat coronary angiography, before contemplating another attempt at a pancreas retransplant. The risks of morbidity and mortality

associated with pancreas retransplant are poorly reported in the literature. However, on the basis of a difficult intra-abdominal procedure in a patient with significant comorbidity, we estimate the overall risk of morbidity and mortality to be 20%. One of the most influential factors in our decision to proceed was the patient's keen desire to be considered for another pancreas transplant with full knowledge of its inherent risks.

Extensive scarring around the iliac vessels prevented their safe isolation, but fortunately, we could identify the remnant of a previous arterial Y-graft on the common iliac artery, which allowed us to do a more-limited dissection. Use of the distal inferior vena cava for systemic drainage of the portal vein is well described and in this case, provided a useful alternative to the iliac venous system. At 3 months after the transplant, the patient's condition is encouraging, and there is no evidence of rejection.

In conclusion, third-time pancreas retransplant is feasible but technically demanding and requires careful patient selection to justify the increased risks of the procedure.

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