Pancreatic transplantation

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Abstract
A pancreas transplant is a surgical procedure to place a healthy pancreas from a donor into a patient whose pancreas no longer functions properly. Exocrine pancreas transplantation remains the standard treatment of choice for patients with diabetes mellitus complicated by end-stage renal disease. The use of pancreas transplantation for type 2 diabetes mellitus is an emerging concept. A pancreas transplant is often done in conjunction with a kidney transplant. Even if pancreas transplantation provides the best glycemic control option for diabetes mellitus, it is associated with significant morbidities related to infectious disease. The present article provides a review of pancreatic transplantation.

Keywords: Graft survival, pancreas transplantation, histopathology, diabetes, pancreas-kidney, infectious disease.

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Introduction
As result of improved surgical techniques and newer immunosuppressive regimens contributing significantly to better graft survival, exocrine pancreas transplantation remains the standard treatment of choice for patients with diabetes mellitus complicated by end-stage renal disease. Histological assessment continues to play an important role in the diagnosis of graft complications after pancreas transplantation, especially for evaluating allograft rejection where histopathology is still considered the gold standard.

A review elaborates on the current types of pancreas transplants and focuses on the patterns of allograft injury that are encountered in posttransplantation pancreas biopsies along with the pertinent differential diagnoses. In addition to optimal histological assessment, as in any other organ transplant setting, clinical information including indication and duration of transplant as well as other serologic work-up must be taken into consideration during clinical decision making for optimal graft outcome [1].

In diabetes type 2
Almost all pancreas transplants are done to treat cases of type 1 diabetes. The use of pancreas transplantation for type 2 diabetes mellitus is an emerging concept. Several lines of laboratory and clinical evidence suggest that in a carefully selected group of patients, long-term glycemic control and allograft function are similar to that observed for pancreas transplants performed for type 1 diabetes [2].

Pancreas after living donor kidney transplant
The first successful pancreas transplantation in conjunction with a simultaneous kidney transplantation (SPKT) was performed by Kelly and Lillehei from the University of Minnesota in 1966 [3]. Now it is a widely accepted therapeutic modality.

One of the alternative options to SPKT for type I diabetics with renal failure is sequential transplant of a living donor kidney followed by a deceased donor pancreas transplant (pancreas after living donor kidney transplant, PALK). We retrospectively compared the outcomes of SPKT versus PALK. Adults (age 18-59 years) with type I diabetes who were waitlisted for kidney-pancreas and received a SPKT or PALK between 2000 and 2007 were now studied. It was compared patient, kidney graft, and pancreas graft survival. Of 11,966 patients who received a kidney transplant, 807 received a PALK and 5580 received a SPKT. Median time to pancreas from kidney transplant was 336 (25-75 %: 

510
185-602 days) days. Average hospital stay for SPKT recipients was 13 ± 15 days, whereas for PALK recipients was 6 ± 4 days and 10 ± 8 days for kidney and pancreas transplants, respectively. After controlling for confounding factors, patients receiving PALK had better patient survival (HR 0.52; 95% confidence interval 0.39 to 0.70) and kidney survival (HR 0.48; 95% confidence interval 0.39 to 0.60) but worse pancreas survival (HR 1.37; 95% confidence interval 1.16 to 1.62) compared with SPKT. Thus, among those who were waitlisted for a kidney-pancreas transplant, 53 percent received a kidney-pancreas transplant. Of those who received a kidney-pancreas transplant, 87 percent patients underwent SPKT and 13 percent underwent PALK. PALK was associated with better kidney graft and patient survival compared with SPKT. It was found an inferior pancreas graft survival and longer total transplant hospitalization in PALK [4].

Infections after transplantation
Pancreas transplantation provides the best glycemic control option for diabetes mellitus but is associated with significant morbidities related to infectious disease.

It was performed a retrospective study of a cohort of consecutive pancreas transplantation recipients in whom pancreas transplantation was performed from 1998 to 2006 (n=216) and followed up them until 2008 [5]. Data regarding infections, rejection, infection chemoprophylaxis, graft failure, absolute lymphocyte counts, and mortalities were collected. Simultaneous pancreas and kidney, pancreas transplantation alone, and pancreas after kidney (PAK) transplantations were performed in 42, 67, and 107 patients, with a mean age at transplantation of 47, 41, and 44 years. Of the simultaneous pancreas and kidney, pancreas transplantation alone, and PAK transplant recipients, 55 percent, 37 percent, and 59 percent were men. Overall, 63 percent developed a serious infection during the median follow-up of 6.4 years. Mean (range) number of infectious episodes was 2.3 (1-12), with mostly bacterial infections both within (68%) and after 1 year (78%). Incidence of bacterial and viral infections was greatest in the first 3 months after transplantation. Fungal infections were more constant. Bladder exocrine drainage was significantly associated with higher risk of infection (hazard ratio 2.5). Infection within the first 3 months after transplantation was related to higher mortality after the first 3 months (hazard ratio 3.19). Absolute lymphocyte counts was significantly associated with the risk of first infections and bacterial infections. Therefore, the incidence of infections after pancreatic transplantation was 63 percent and mostly bacterial. Bladder drainage increases infection risk and low absolute lymphocyte counts partially predicts episodes [5].

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