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Enteric Drainage of Pancreas Transplants Revisited

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IN THE LAST few years the majority of pancreas transplants performed in this country have been drained through the bladder,[1] which is a modification of the original Starzl technique of pancreatic duodenal grafts drained into the small intestine.[2] However, urologic complication rates related to bladder drainage (BD) have remained high, which has lead to increased morbidity,[3] lengthy hospitalizations, and an increase in cost. As better success rates of achieving an insulin-free state with normal carbohydrate metabolism have occurred in transplant centers performing simultaneous pancreas kidney transplantation (SPK), it is logical to extend this procedure, to a greater degree, to those diabetic patients requiring a solitary graft which heretofore have represented only a small percentage of the total number of pancreas transplants performed. To achieve this goal, however, success rates in the solitary organ group need to improve and morbidity must be low with subsequent lower cost.

We report herein our recent experience within the last several months with 21 enteric-drained (ED) pancreases and 10 BD grafts.

MATERIALS AND METHODS

To date, there has been no mortality and actuarial success rates are 94% for kidney and 81% for pancreas for the entire series. There has been no kidney or pancreas graft loss for the BD group, and success rates for the ED group are 91% for kidney and 72% for pancreas.

Pancreas losses in the ED group appeared to be unrelated to the drainage method and included two early thromboses which were related to donor factors including an older donor on high-dose vasopressors and another donor who was hypernatremic (sodium 170). Other losses included hyperacute rejection of both grafts at 6 days in a highly sensitized patient, another at 11 days related to a rejection episode, and another resulting from a ligated inferior pancreatic duodenal artery, which was undiscovered until graft removal at 6 days. One patient had a systemic and perigraft candida infection necessitating discontinuation of immunosuppression, resulting in removal of both pancreas and kidney transplants. Only in this case could the enterotomy be related to the infection and subsequent graft loss.

Two cases in the ED group developed wound infections which included the patient with systemic candida infection and the patient whose grafts were removed following hyperacute rejection. The BD group had urologic complications in 5 of 10 patients including severe hematuria in 3, and fistula in 2 (1 of which required conversion to ED). Wound breakdown occurred in the two patients who developed fistulae and in one of the three patients who had severe hematuria. All patients with hematuria stopped bleeding spontaneously within a few days following repeated irrigations. No grafts were lost in this group, but hospitalizations were extended in all five who had complications.

RESULTS AND DISCUSSION

To say that enteric drainage is superior to bladder drainage might be premature from these preliminary data. However, none of the 21 ED patients developed a fistula, and wound infection occurred only in the patient with systemic *Candida* infection and in another with superficial infection following pancreas removal from hyperacute rejection. Objective evaluation of the pancreas losses within the ED group suggests that only the case with the *Candida* wound infection and systemic candidiasis could the method of drainage be implicated. The other losses in the ED group were clearly related to factors other than the method of drainage.

A large series from the University of Wisconsin recently presented showed a urologic complication rate of 52% in 232 patients receiving SPK.[3] In this group of 121 patients with complications, there were 172 episodes related exclusively to the BD method. These complications included recurrent urinary tract infections, 35%; severe chronic hematuria, 22%; fistula, 22%; reflux pancreatitis, 14%; and urethral lesions, 7%. Eighteen percent of the entire group of 232 patients required conversion to enteric drainage. A recent report of 36 recipients from the Stockholm group revealed an 83% 1-year pancreas transplant success rate in patients drained by the enteric method.[6] In this single center report, the success rate was good and complications were minimal.

The principle reasons for using BD was first to avoid contamination from the enterotomy, and second to permit measurement of urinary amylase levels and other parameters which might signal rejection. Contamination from the enterotomy may have occurred in two of our cases. While enteric drainage precludes the use of urinary amylase as an indicator of rejection as well as transcystoscopic pancreatic biopsy, it does not exclude the performance of percutaneous fine needle aspiration (FNA) which has proven to be a reliable indicator of intragraft events such as rejection and drug toxicity. Using this method, the pancreas is placed in the right paracolic gutter rendering it easily accessible for FNA.

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In view of our experience with FNA in ED pancreas transplants,[7] and the high morbidity associated with BD, we believe that another trial of ED should be undertaken. We have been encouraged thus far that complications are low, particularly since none of our last 12 patients has had morbidity. In addition, pancreas losses in the ED group seem to be related to factors other than the method of drainage. Whether or not additional complications related to ED will occur as more of these procedures are performed will be evaluated as larger numbers of patients are accumulated.

We suggest that ED is at least equivalent to bladder drainage and avoids the high incidence of morbidity from urologic complications related to the BD technique.

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