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## SPONTANEOUS ARTERIOENTERIC FISTULA AFTER PANCREAS TRANSPLANTATION

H. ALBIN GRITSCH,<sup>1,2</sup> RON SHAPIRO,<sup>3</sup> FRANCESCA EGIDI,<sup>3</sup> PARMJEET S. RANDHAWA,<sup>4</sup>  
THOMAS E. STARZL,<sup>3</sup> AND ROBERT J. CORRY<sup>3</sup>

*Division of Urologic Surgery/Renal Transplantation, Pittsburgh Transplantation Institute, and Division of Transplantation Pathology, Departments of Surgery and Pathology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania 15213*

**Chronic pancreas transplant rejection with enteric exocrine drainage can lead to significant long-term complications. We report a case of a 47-year-old male insulin-dependent diabetic who survived the complications of peripancreatic abscess, enterocutaneous fistula, and arterioenteric fistula related to pancreas transplantation. To avoid these long-term complications, we now recommend elective removal of non-functioning, enterically drained pancreas allografts.**

Bladder drainage has become the most common technique for diversion of pancreas transplant exocrine secretions (1, 2). Urologic complications develop in over 50% of these patients (3). In an attempt to decrease the morbidity and cost of pancreas transplantation, we utilized enteric exocrine drainage for the most recent simultaneous pancreas kidney transplants (4). The 1-year pancreas graft survival rate using this technique was 87% in a recently reported series (5). The long-term complications of enteric drainage will require further study. We report herein a nearly fatal complication after pancreas transplantation with enteric drainage.

The patient was a 47-year-old white man with insulin-dependent diabetes mellitus since the age of 5. When he was 36 years old, he developed chronic renal failure secondary to diabetic glomerulosclerosis. After 9 months on hemodialysis, in December 1982, an uneventful cadaveric renal transplant was performed with anastomosis of the donor vessels to the right external iliac artery and vein of the recipient. Cyclosporine and prednisone immunosuppression were maintained after renal transplantation. In March 1983, he was the recipient of a pancreaticoduodenal transplant with enteric drainage to the recipient jejunum. The donor spleen was initially transplanted with the pancreas allograft; however, the patient developed a hemolytic anemia, and a splenectomy was performed on postoperative day 6. The details of this pancreaticoduodenal transplant were reported previously (6). He remained euglycemic for 14 months until the pancreas suddenly failed, and a left lower quadrant extraperitoneal abscess was identified and surgically drained. In July 1985, the patient received his second pancreas transplant through a midline abdominal incision. The allograft was based on both the celiac axis and the superior mesenteric artery, which were anastomosed to the left common iliac artery in an end-to-side fashion using a common Carrel patch. The portal vein was anastomosed to the left common

iliac vein in a similar fashion. The spleen was removed after reperfusion, and a side-to-side anastomosis was made between a short segment of the duodenum and the recipient jejunum. The previous pancreas transplant could be seen in the left extraperitoneal space, but it was not disturbed. On postoperative day 12, acute rejection was diagnosed and treated with OKT3. Immunosuppression was maintained with cyclosporine, azathioprine, and prednisone. In October 1985, the patient developed a recurrent left lower quadrant abscess with an enterocutaneous fistula from his first pancreas transplant. This allograft pancreas and duodenal remnant were removed. Once this infection resolved, the patient had stable renal and pancreas function for 8 1/2 years. In 1994, he gradually required increasing doses of insulin to regulate his blood glucose; his serum creatinine was stable at approximately 2.5 mg/dl.

In November 1995, the patient was admitted to his local hospital with hematochezia. After 2 days the bleeding increased and he was transferred by helicopter to the University of Pittsburgh Medical Center. On admission, there was massive lower gastrointestinal hemorrhage with severe hypotension. The patient was immediately transferred to the operating room and hemodynamically resuscitated. The old midline incision was opened, and multiple loops of small bowel were adherent to a very firm fibrotic and pulsatile pancreas in the left periumbilical area. The donor duodenum attached to the jejunum was distending rapidly with blood. The small bowel was stapled on both sides of the jejunal anastomosis, freeing the anterior portion of the pancreas graft. The posterior portion of the pancreas graft was adherent to the distal aorta and upper iliac vessels on the left. Although there were no planes, the organ was freed by blunt and sharp dissection from these posterior structures. The duodenal segment had to be opened, as it was pulsatile and becoming rapidly distended with arterial blood. After opening of the duodenal segment, a finger was inserted into a large cavity in the body of the pancreas, which had necessitated through to the duodenal segment (Fig. 1). While the finger controlled the bleeding, dissection was continued in the retroperitoneum. The aortic bifurcation was located, and a clamp was placed on the left common iliac immediately at its takeoff from the aorta. A vascular clamp was then placed distally on the iliac artery and vein, which were both covered with thick layers of hyalinized inflammatory material. The specimen was removed en bloc from the operating field. There was a fair amount of bleeding deep in the pelvis, which was controlled with several suture ligatures. An enterocenterostomy was then performed joining the two divided ends of the jejunum. The abdomen was irrigated, hemostasis was ensured, and the wound was closed. A right-to-left femoral-to-femoral artery bypass was then performed to reestablish

<sup>1</sup> Division of Urologic Surgery/Renal Transplantation, Department of Surgery.

<sup>2</sup> Address correspondence to: H. Albin Gritsch, MD, Division of Urologic Surgery/Renal Transplantation, University of Pittsburgh Medical Center, 3471 Fifth Avenue, Suite 700, Pittsburgh, PA 15213.

<sup>3</sup> Pittsburgh Transplantation Institute, Department of Surgery.

<sup>4</sup> Division of Transplant Pathology, Department of Pathology.

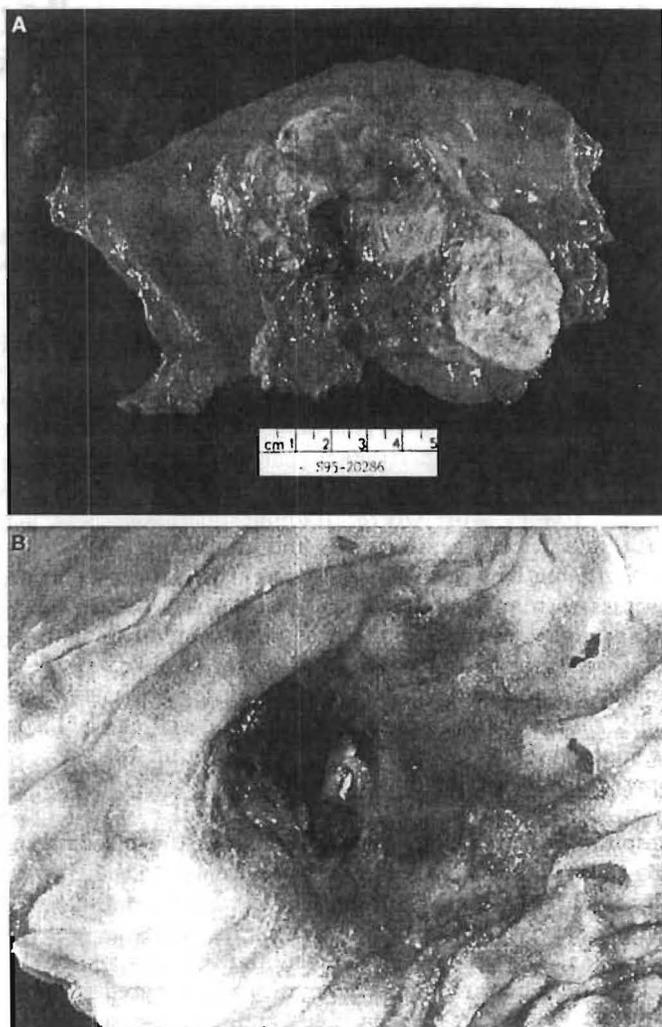


FIGURE 1. Iliac artery-enteric fistula after pancreas transplantation with enteric exocrine drainage: (top) pancreaticoduodenal allograft with chronic rejection and central area of necrosis; (bottom) view of iliac artery fistula into the duodenal portion of the allograft.

perfusion of the lower extremity. The patient received 24 U of packed red blood cells, 12 U of fresh frozen plasma, 20 U of platelets, and approximately 25 U of cell-saver blood from two blood reprocessing machines during surgery.

The patient did surprisingly well after the operation. The renal allograft had a brief period of nonoliguric renal failure secondary to hypotension; however, the patient did not require dialysis. The main postoperative problem was left lower extremity edema and foot drop. A left leg fasciotomy revealed viable muscle. He was transferred to a rehabilitation center for gait training on postoperative day 10.

An analysis of the International Pancreas Transplant Registry reports that 69% of pancreas graft failures occur within the first 6 months (2). These acutely failed grafts are usually

symptomatic and are removed promptly. The indications for transplant pancreatectomy after this time period are not well defined. Troppmann et al. (7) reviewed the indications for transplant pancreatectomy at the University of Minnesota and found that graft removal was necessary after 26% of all pancreas transplants. Only 25% of the organs lost to rejection required removal (7). Tzakis et al. (8) reported four cases of mycotic aneurysm rupture after graft pancreatectomy, one of which occurred more than a year later. However, this case demonstrates the significant morbidity that may occur with a nonfunctioning pancreas allograft. The first pancreas allograft developed an abscess with enterocutaneous fistula and the second pancreas developed a nearly fatal iliac artery-enteric fistula. Both of these pancreas allografts had enteric exocrine drainage, which may be an important factor, although arteriovesical fistula has also been reported with bladder drainage (9). We now recommend elective pancreas allograft removal when graft failure has been clearly documented in patients with low anesthetic risk factors. Alternatively, the nonfunctioning pancreas allograft should be followed closely with serial imaging studies to detect occult abscess or fistula formation.

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