Transplantation Operation

Simultaneous pancreas-kidney allograft procedure. Most pancreas transplantations performed in the United States are whole organ pancreaticoduodenal allografts from cadaveric donors transplanted simultaneously with the kidney from the same donor [1]. Because the pancreas from a patient with diabetes still subserves digestive function, it is not removed. Therefore, the pancreaticoduodenal allograft is transplanted to an ectopic location, usually the right iliac fossa. Similarly, the kidney allograft is transplanted ectopically to the contralateral iliac fossa. The reconstructed arterial supply to the pancreas, as shown in Figure 15-9, is anastomosed to the common or external iliac artery. The portal vein of the allograft is anastomosed to the common iliac vein or distal inferior vena cava. Likewise, on the left side the renal artery and vein are anastomosed to the common iliac artery and vein, respectively. To restore the continuity of the urinary tract, a standard ureteroneocystostomy is constructed to the dome of the bladder.

Because the pancreas has dual endocrine and exocrine functions, it is necessary to perform another anastomosis to handle exocrine secretions. A variety of techniques to manage pancreatic exocrine secretions have been proffered over the years with less than satisfactory results. These include duct occlusion, open drainage into the peritoneal cavity, and creation of a button of duodenum and anastomosing this or the pancreatic duct directly to the bladder. Currently, the most commonly performed technique in the United States is drainage of pancreatic exocrine secretions into the bladder (bladder drainage, BD), as depicted [1]. The BD technique involves fashioning a short segment of donor duodenum, which is transplanted along with the pancreas. Then the donor duodenum is anastomosed to the dome of the recipient bladder in a side-to-side manner. In this way exocrine secretions, including enzymes, proenzymes, water, and sodium bicarbonate, are diverted into the urinary tract. This technique is safe, reliable, and well tolerated; however, it is associated with a number of specific urinary tract complications.

As a consequence of implantation into the iliac fossa, the pancreatic allograft is drained into the systemic venous circulation, as depicted. This results in systemic venous, rather than portal venous, insulin release and peripheral hyperinsulinemia. An alternative approach practiced by some surgeons is portal venous drainage. In this approach the portal vein of the allograft is anastomosed to the superior mesenteric vein of the recipient in an end-to-side fashion. This technique establishes drainage of insulin into the portal venous blood flow, perhaps a more physiologic situation (procedure not shown). The results of the two techniques are largely comparable. Fortunately, patients have suffered no adverse effects of systemic venous drainage and hyperinsulinemia.

Solitary pancreaticoduodenal allografts are implanted into either iliac fossa, at whichever point the iliac vessels permit vascular anastomoses. This procedure is done, usually and preferentially, on the right side. Otherwise, the operative sequence duplicates that of the combined procedure.