

PIGGYBACK ORTHOTOPIC INTESTINAL TRANSPLANTATION

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PORTAL, as opposed to systemic, venous drainage from small intestinal allografts is thought to be preferable because it provides unquestionable physiologic (1-3) and hypothetic, but unverified (4, 5) immunologic advantages. However, in clinical instances, it may be difficult to find a place on the recipient portal or superior mesenteric vein (SMV) where the donor portal vein can be anastomosed. We encountered this problem in two most recent solitary intestinal transplants. One patient was an adult with 15 previous abdominal operations and the other was a child with only one earlier laparotomy.

The abdomen was entered through an upper transverse incision. Because of multiple adhesions, the recipient SMV could not be adequately

exposed below the pancreas. The duodenum and head of the pancreas were mobilized, exposing the infrarenal aorta for arterialization of the graft. The maneuver helped expose the extrahepatic portal vein as for portacaval shunts (Fig. 1). The common bile duct and, in the pediatric patient, an ectopic right hepatic artery arising from the superior mesenteric artery (SMA) were identified and carefully preserved.

The arterial anastomosis of the donor SMA to the infrarenal aorta was performed first. A side biting vascular clamp was subsequently placed on the recipient portal vein and an end to side anastomosis of the donor to the recipient portal vein was performed (Fig. 1, inset). Arterial and venous reconstructions were satisfactory (Fig. 2).

A recipient duodenum to donor jejunum anastomosis, a terminal ileostomy and feeding jejunostomy were performed in both patients. In the pediatric patient, a donor ileum to recipient transverse colonic anastomosis was also performed. Immunosuppression was with FK 506 and steroids. There were no technical complications.

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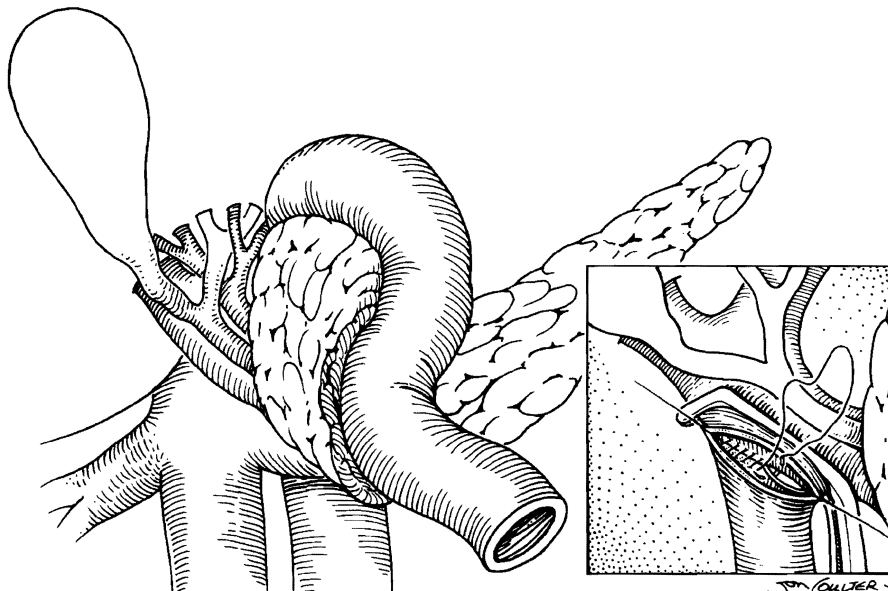


FIG. 1. The recipient duodenum has been kocherized. The portal vein and infrarenal aorta are exposed. Common bile duct and hepatic artery are identified. Inset, technique of end to side anastomosis.

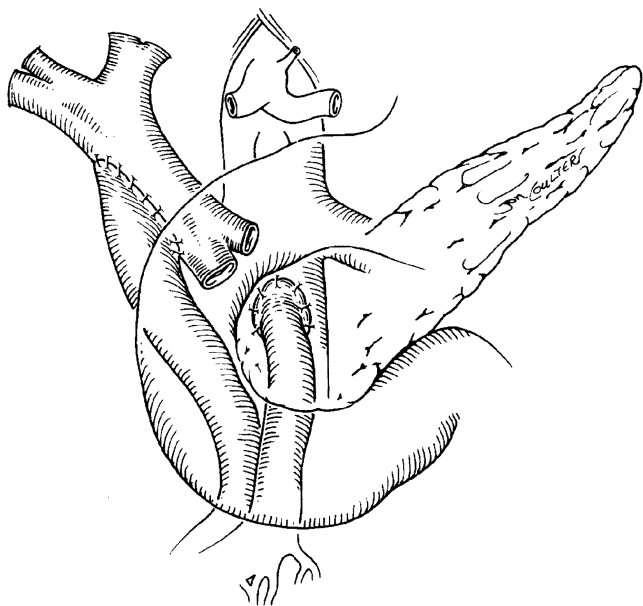


FIG. 2. The vascular anastomoses are completed and the duodenum is allowed back to its anatomic position.

Finding a residual portal or SMV stump for end to end anastomosis of the intestinal graft vein is a daunting prospect in patients who have lost their intestine. Although candidates for in-

testinal transplantation can be expected to have had multiple abdominal operations, the hepatic hilum usually is spared, providing a site onto which the donor SMV or portal vein can be anastomosed piggyback. The aforementioned technique should provide dependable portal drainage in most instances. The splenic vein could be alternatively used, using the same principle.

REFERENCES

1. Starzl, T. E., Todo, S., Tzakis, A., and others. The many faces of multivisceral transplantation. *Surg. Gynecol. Obstet.*, 1991, 172: 335-344.
2. Koltan, W. A., Madera, J. L., Smith, R. J., and Kirkman, R. L. Metabolic aspects of small bowel transplantation in inbred rats. *J. Surg. Res.*, 1987, 42: 341-347.
3. Schraut, W. H., Rosemurgy, A. S., and Riddle, R. H. Prolongation of intestinal allograft survival without immunosuppressive drug therapy. *J. Surg. Res.*, 1983, 34: 597-607.
4. Mazzoni, G., Benichou, J., Porter, K. A., and Starzl, T. E. Renal homotransplantation with venous outflow or infusion of antigen into the portal vein of dogs or pigs: Transplantation at portal site. *Transplantation*, 1977, 24: 268-273.
5. Murase, N., Demetris, A. J., Furuya, T., and others. Comparison of the small intestine after multivisceral transplantation and the small intestine transplanted with portal versus caval drainage. *Transplant Proc.*, 1992, 24: 1143-1144.