

Autologous Pancreatic Islet Transplantation for Severe Trauma

TO THE EDITOR: Autologous pancreatic islet transplantation has been successfully carried out after total pancreatectomy for chronic pancreatitis, and allogeneic islet-cell transplantation has had limited success.^{1,2} We report a case of successful islet transplantation from the pancreas after total pancreatectomy because of trauma.

A 21-year-old airman serving in a remote part of Afghanistan was hit by three high-velocity bullets on November 21, 2009, and was rapidly transferred to Walter Reed Army Medical Center. As part of needed rescue surgery, a portion of the stomach, the gallbladder, the entire duodenum, and the head of the pancreas were removed. In addition, the patient required left hemicolectomy and resection of a portion of the small bowel.

During the attempt to reconstruct the intraabdominal structures, the remnant pancreas (weighing 63.5 g, approximately half the entire pancreas) was found to be damaged from the effects of the gunshot wounds and was leaking pancreatic enzymes and dissolving critical abdominal structures and blood vessels. We decided to remove the entire remaining pancreas to prevent further leakage, breakdown, and bleeding, which could be fatal. The pancreas was flushed with University of Wisconsin solution, packed in ice, and transported to the University of Miami. The islets (221,250 islet equivalents of 40% purity and 90% viability) were shipped back to Walter Reed, where by laparotomy they were injected back into the patient's main portal vein so as to seed in the liver. Portal pressures remained normal throughout the infusion.

Levels of C-peptide in basal and stimulated (after an oral glucose-tolerance test) conditions were 0.5 ng per milliliter with a glucose level of 80 mg per deciliter (fasting) and 3.9 ng per milliliter with a glucose level of 184 mg per deciliter (stimulated). As of postoperative day 114, the pa-

tient had normal islet function. Liver enzymes peaked on day 3 (800 IU for aspartate aminotransferase and 900 IU for alanine aminotransferase) and normalized on day 8. The patient was able to discontinue insulin on day 24. Initially, he required a small amount of insulin (1 to 2 units per hour) for total parenteral nutrition and 11 serial surgical procedures to close his abdomen. As of day 20, the patient was eating a normal diet.

In this patient, we were able to isolate and transplant insulin-producing cells after a severe trauma requiring complete removal of the pancreas. This procedure may prevent diabetes and secondary complications if even a small portion of pancreas can be salvaged. We also showed the feasibility of sending a pancreas to a remote location for islet isolation and purification and then transporting the islets back for successful infusion within 24 hours.³

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Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

The views expressed in this letter are those of the authors and do not reflect the official policy of the Department of the Army, Department of the Navy, Department of Defense, or U.S. government.

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