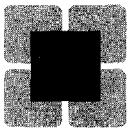

INTRODUCTION

Pancreas transplantation: alternatives and limitations

A FUNCTIONING pancreatic graft consistently does a better job of approaching normoglycemia than even the most conscientious patient who has the help of an experienced health care team.[1] Information about the potential value of pancreatic transplantation is readily available to diabetic patients who read the lay literature,[2] and these individuals expect their physicians to be well informed about this treatment option.

In this issue of the *Cleveland Clinic Journal of Medicine*, Sharon Grundfest-Broniatowski, MD, provides the information necessary to counsel patients effectively about pancreatic transplantation. Her concise yet comprehensive review addresses the issues of patient selection, risks, potential benefits, and progressively improving success rates.

See Grundfest-Broniatowski (pp 564-570).

Two additional issues warrant our attention: (1) alternatives to traditional insulin therapy besides pancreas transplantation and (2) factors that may limit the long-term success of pancreatic grafts.

Two alternatives to traditional subcutaneous, intravenous, and the more recently available intraperitoneal[3] insulin delivery are being investigated. One method is a "closed loop" system that would require an indwelling glucose sensor linked by a computerized controller to an insulin delivery system. Although closed loop systems exist, they are too cumbersome and expensive for routine use; no one has yet developed a functional miniaturized glucose sensor for chronic outpatient use. Even if such a device were available, a system that administers only insulin will never be as good as the islet cell, which also secretes glucagon, somatostatin, and other substances important to glucose regulation.

Islet cell transplantation is the other potential alternative.[4] The ideal circumstance would be a source of cultured islet cells with low immunogenicity to permit administration of sufficient islet cell mass to achieve normoglycemia. Currently, the separation of islets from the intact pancreas is labor-intensive and results in a relatively low yield. Furthermore, islets do not readily reproduce in cell culture. Fetal islet cells may be less immunogenic, but the availability is restricted.

It is not known whether the immunologic defect that originally caused the islet cell destruction in the diabetic patient may recur in a pancreatic graft; this may be a limiting factor in long-term graft viability. When Sutherland and colleagues[5] performed living related-donor pancreatic grafts in identical twins discordant for diabetes, they showed graft failure to be the result of an isletitis typical of new-onset diabetes. The use of immunosuppressive treatment seemed to control this destructive process in subsequent pairs of twins. Nevertheless, the question remains whether chronic immunosuppressive therapy can effectively prevent the slow destruction of beta cells in pancreatic (and, for that matter, islet cell) grafts. Only long-term follow-up of successful grafts will answer these questions.

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