

OPEN

First Czech-Slovak Intercountry Islet Autotransplantation – Brief Case Report

Peter Girman¹, PhD, MD,¹ Jan Kriz, PhD, MD,¹ Lenka Némětová,¹ Ivan Leontovyč, Mgr,¹ Kateřina Bittenglová, Mgr,¹ Lenka Nosáková, MD,² Miroslav Pindura, MD,² Patrik Horan, MD,² Peter Bánovčín, MD,² Blažej Palkoci, MD,² Denisa Osinová, MD,² Daniel Bolek, MD,² and Juraj Miklušica, MD, PhD²

Islet autotransplantation is an effective procedure that prevents or lessens diabetes after a total pancreatectomy. Posttransplant insulin-independence rate may be as high as 30%, according to the recent data reported by experienced centers.¹ The procedure availability in various countries depends on the presence of an islet isolation laboratory. Transplantation success depends on the professional laboratory team and the number of islet isolations. Training the special isolation team is a long-term process, taking several years and requiring institutional support, funding, and overcoming the first period of unsuccessful isolations. Recent review of islet isolation facilities shows plenty of inactive or partially active laboratories. This is a significant obstacle to the further increase of islet transplantation numbers.²

In Middle-Eastern Europe, only the Prague center has experience with >400 isolations and approximately 150 islet transplantations. Thus, we decided to spread this therapeutic modality to other countries, and we briefly report on the first Middle-Eastern Europe international autologous islet transplant performed with the surgical team at the University Hospital in Martin, Slovakia. The transplanted

patient was a 29-y-old nondiabetic male patient with hereditary chronic pancreatitis experiencing recurrent acute algic attacks since approximately 17 y of age. Regarding an anticipated need for total pancreatectomy, the patient was referred to the Pancreatic Islet Laboratory in Prague, Czech Republic, to assess his eligibility for islet autotransplantation. After the logistical preparation, which included the patient's consent, approval of both centers, organization of the transport, and agreement with his insurance company, the surgery date was set. The Slovak surgical team removed the pancreas and sent it for islet processing in Prague. During a 3-h procedure, 134 000 nonpurified islets were obtained and transported back to Martin University Hospital. A member of the isolation team assisted with islet infusion through a catheter into the portal vein. The time from isolation to initiation of islet infusion was 8 h. Six months after the procedure, the patient had a fasting C-peptide level of 0.1 µg/L. His hemoglobin A1c was 37 mmol/mol (upper limit 40); he has been using 21 IU of insulin administered by an insulin pump. His time in range (glucose level 4–10 mmol/L) is >90%. The patient's quality of life considerably improved in terms of pain relief. Insulin independence was not achieved mainly because of a strongly calcified pancreas resistant to digestion.

Cooperation in islet autotransplantation between sites in 2 countries requires detailed preparation, enthusiasm, teamwork, and experience. Given the decreasing number of active isolation centers, a possibility exists to expand islet transplantation availability for other countries. A cost-benefit of the procedure was documented previously in modern European countries and at US centers. In middle-income countries, air traffic for such long distances may represent a significant hurdle in the short-term view. However, similarly to other world consortia, establishing the Middle-Eastern Europe network consisting of one experienced isolation facility and several remote transplantation hospitals would make the procedure available to more patients and finally easily overcome the traffic costs.^{3–5}

Received 25 September 2023. Revision received 9 October 2023.

Accepted 11 October 2023.

¹ Diabetes Center, Institute for Clinical and Experimental Medicine, Prague, Videňská, Czech Republic.

² University Hospital Martin, Kollarova 2, 03659, Martin, Slovak Republic.

The authors declare no conflicts of interest.

Supported by the project National Institute for Research of Metabolic and Cardiovascular Diseases (Programme EXCELES, ID project no. LX22NPO5104) and funded by the European Union–Next Generation EU. This study was also supported by MH CZ–DRO (IKEM, IN 00023001).

P.G. participated in organization, transport, and islet transplantation and article preparation. J.K. participated in islet isolation and article revision. L.Né. participated in islet isolation and tissue transport. I.L. and K.B. participated in islet isolation. L.No. participated in recipient indication and preparation and article revision. M.P., P.H., B.P., and D.B. participated in total pancreatectomy. P.B. participated in recipient indication and preparation. D.O. participated in anesthesia. J.M. participated in total pancreatectomy and article revision.

Correspondence: Peter Girman, MD, PhD, Diabetes Center Institute for Clinical and Experimental Medicine, Prague, Videňská 1958/914021, Czech Republic. (pegi@ikem.cz).

Copyright © 2023 The Author(s). Transplantation Direct. Published by Wolters Kluwer Health, Inc. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

ISSN: 2373-8731

DOI: 10.1097/TXD.0000000000001562

REFERENCES

- McEachron KR, Bellin MD. Total pancreatectomy and islet autotransplantation for chronic and recurrent acute pancreatitis. *Curr Opin Gastroenterol.* 2018;34:367–373.
- Berney T, Andres A, Bellin MD, et al; International Islet Transplant Centers. A worldwide survey of activities and practices in clinical islet of Langerhans transplantation. *Transpl Int.* 2022;35:10507.

3. Kassam AF, Cortez AR, Johnston ME, et al. Total pancreatectomy with islet autotransplantation reduces resource utilization in pediatric patients. *Am J Surg.* 2021;222:786–792.
4. Wilson GC, Ahmad SA, Schauer DP, et al. Cost-effectiveness of total pancreatectomy and islet cell autotransplantation for treating minimal change chronic pancreatitis. *J Gastrointest Surg.* 2015;19:46–54; discussion 54.
5. Lablanche S, Borot S, Wojtuszczyzn A, et al; GRAGIL Network. Ten-year outcomes of islet transplantation in patients with type 1 diabetes: data from the Swiss-French GRAGIL network. *Am J Transplant.* 2021;21:3725–3733.