

University of Massachusetts Medical School

eScholarship@UMMS

Surgery Publications

Surgery

2018-09-25

Bipolar Sealing Device Use in Pancreas Graft Preparation: A Novel Tieless Backtable Surgery Technique


Paulo N.A. Martins

University of Massachusetts Medical School

Et al.

Let us know how access to this document benefits you.

Follow this and additional works at: https://escholarship.umassmed.edu/surgery_pp

 Part of the [Analytical, Diagnostic and Therapeutic Techniques and Equipment Commons](#), [Digestive System Commons](#), and the [Surgery Commons](#)

Repository Citation

Martins PN, Gillooly AR, Movahedi B, Bozorgzadeh A. (2018). Bipolar Sealing Device Use in Pancreas Graft Preparation: A Novel Tieless Backtable Surgery Technique. Surgery Publications. <https://doi.org/10.1097/TXD.0000000000000831>. Retrieved from https://escholarship.umassmed.edu/surgery_pp/162

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-No Derivative Works 4.0 License](#).

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in Surgery Publications by an authorized administrator of eScholarship@UMMS. For more information, please contact

Lisa.Palmer@umassmed.edu.

OPEN

Bipolar Sealing Device Use in Pancreas Graft Preparation: A Novel Tieless Backtable Surgery Technique

Paulo N. Martins, MD, PhD, Andrew R. Gillooly, BS, Babak Movahedi, MD, PhD, and Adel Bozorgzadeh, MD

Pancreas backtable preparation is of crucial importance for the success of transplantation. It is a very time-consuming procedure requiring many suture ligations and is not infrequently associated with significant bleeding necessitating blood transfusion.¹ Much of the progress in pancreas transplantation in the past 20 years has been achieved through improved surgical technical strategies. Further optimization in technical approaches should continue to improve outcomes. The use of bipolar sealing devices has never been reported in backtable pancreas operations. We describe here for the first time the utilization of a bipolar electro-surgical device (BED) during the pancreas graft backtable procedure. Bipolar electro-surgical devices were introduced into clinical practice about 10 years ago and have wide hepatobiliary applications, including liver transplantation and pancreaticoduodenectomy.^{2,3} They have been shown to seal arteries up to 7 mm and veins up to 12 mm with precision.⁴ The advantages of BED are: (1) better sealing of vessels and less bleeding; (2) sealing of

rich lymphatic system in graft and during dissection of iliac vessels in the graft bed, thereby decreasing lymphocele rates⁵; (3) single surgeon preparation not requiring an assistant; (4) possible reduced operative time; and (5) potential cost-effectiveness (shorter operating room cases, reduced personnel requirements, and fewer blood transfusions).⁴ Bipolar electro-surgical devices are already available in virtually all transplant centers and do not require specialized training to operate. The same device can be used for the backtable procedure and recipient operation. Regarding cost-effectiveness it is worth mentioning that although the price of the disposable BED is roughly US \$500, a single unit of PRBCs ranges from US \$300 to US \$400 and 1 hour in the operating room costs approximately US \$2200.³

We now describe a new technique of pancreas bench preparation for the first time using a BED. This study was exempt from approval of the institution's ethics board. Stapling of the mesentery and suture ligation of the bile duct stump and gastroduodenal artery were performed at the donor hospital. The procedure is depicted in Figure 1 and the accompanying video (Figure 1, SDC, <http://links.lww.com/TXD/A150>). We used LigaSure Impact (Covidien) with the power supply level fixed at 2. The device was used both for limited dissection and for sealing vessels. All edges (ligaments), the splenic hilum, and retroperitoneum were sealed continuously around the pancreas (without skip areas). The mesentery root (previously stapled) was sealed with the bipolar device. Vascular reconstruction with donor iliac artery Y graft was done in standard fashion with 6-0 prolene. We performed a leak check with portal vein clamping by a Satinsky clamp and infusion of University of Wisconsin solution by gravity through the Y graft arterial inflow. Any leak was sealed with the device. We have performed 6 pancreas backtable procedures with this technique each taking between 30 and 45 minutes. Minimal intraoperative bleeding was observed and no patient required blood transfusion. We observed no pancreatic fistula or wound infection, and no patient was brought back to the operating room.

We describe here for the first time the use of a bipolar sealing device in backtable surgery for pancreas transplantation. The novel technique is safe, rapid, and does not require specialized skills. Bipolar sealing in backtable pancreas preparation may improve outcomes (less bleeding), save time, and

Received 1 August 2018. Revision requested 3 August 2018.

Accepted 9 August 2018.

Division of Transplantation, Department of Surgery, University of Massachusetts, Worcester, MA.

The authors declare no funding or conflicts of interest.

Correspondence: Adel Bozorgzadeh, MD, FACS, Division of Transplantation, Department of Surgery, University of Massachusetts Memorial Medical Center, 55 Lake Ave North, Worcester, MA 01605. (adel.bozorgzadeh@umassmemorial.org).

P.M. participated in research design, writing of the article, performing the surgeries, and data analysis.

A.G. participated in writing of the article and data analysis. B.M. participated in the research design, writing of the article, performing the surgeries, and data analysis. A.B. participated in the research design, writing of the paper, performing the surgeries and data analysis.

Supplemental digital content (SDC) is available for this article. Direct URL citations appear in the printed text, and links to the digital files are provided in the HTML text of this article on the journal's Web site (www.transplantationdirect.com).

Copyright © 2018 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

Transplantation Direct 2018;4: e397; doi: 10.1097/TXD.0000000000000831.

Published online 25 September, 2018.

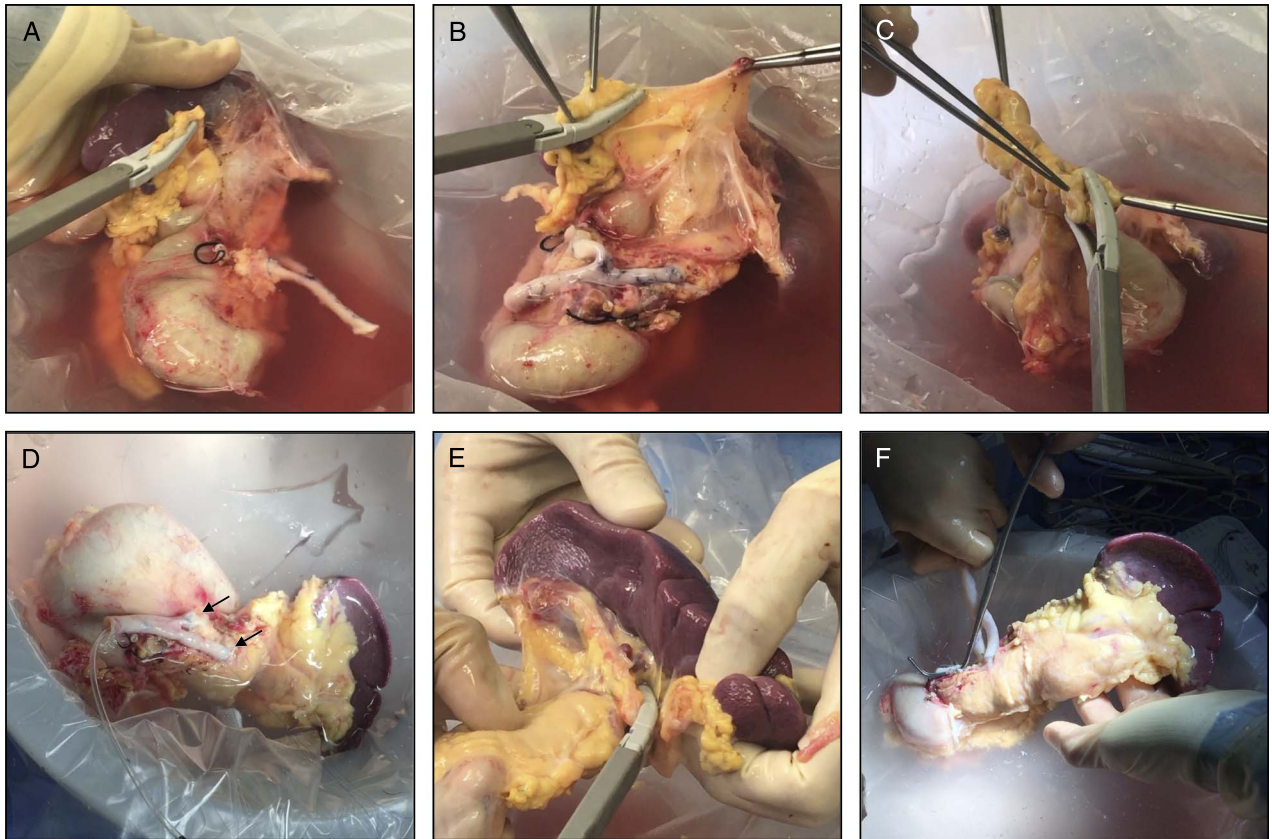


FIGURE 1. Backtable preparation of pancreas allograft with bipolar sealing device. A, B, Sealing all pancreatic borders where pancreatic ligaments were divided. C, Sealing intestinal mesentery below duodenum, previously stapled during procurement. D, Standard donor iliac Y graft, with external iliac artery to superior mesenteric artery (left arrow) and internal iliac artery to splenic artery (right arrow). E, Sealing and partial division of splenic hilum with BED (completion of splenectomy was done after reperfusion). F, University of Wisconsin solution leak test by gravity through cannulated iliac Y graft inflow with clamped portal vein.

be cost-effective. Randomized trials to investigate superiority and cost-effectiveness of this technique are justified.

REFERENCES

1. Gill IS, Sindhi R, Jerius JT, et al. Bench reconstruction of pancreas for transplantation: experience with 192 cases. *Clin Transplant*. 1997;11: 104–109.
2. LaMattina JC, Hosseini M, Fayek SA, et al. Efficiency of the ligasure vessel sealing system for recipient hepatectomy in liver transplantation. *Transplant Proc*. 2013;45:1931–1933.
3. Eng OS, Goswami J, Moore D, et al. Safety and efficacy of LigaSure usage in pancreaticoduodenectomy. *HPB (Oxford)*. 2013;15:747–752.
4. Piccinni G, Pasculli A, D'Ambrosio E, et al. Retrospective comparison of Traditional vs. LigaSure impact dissection during pancreatoduodenectomy: how to save money by using an expensive device. *Surg Technol Int*. 2013; 23:88–93.
5. Takebayashi K, Shiomi H, Naka S, et al. Utility of microwave surgical instrument in sealing lymphatic vessels. *Am J Surg*. 2013;206:229–233.