



Increasing evidence for minimally invasive approach to distal pancreatectomy

Bergthor Björnsson, Per Sandström

Department of Surgery and Clinical and Experimental Medicine, Linköping University, Linköping, Sweden

Correspondence to: Bergthor Björnsson. Department of Surgery, Linköping University Hospital, Garnisonvägen, 58185 Linköping, Sweden. Email: bergthor.bjornsson@liu.se.

Comment on: Matsumoto I, Kamei K, Sato S, *et al.* Laparoscopic versus open distal pancreatectomy for benign and low-grade malignant lesions of the pancreas: a single-center comparative study. *Surg Today* 2019;49:394-400.

Received: 08 August 2019; Accepted: 19 August 2019; Published: 03 September 2019.

doi: 10.21037/ls.2019.08.04

View this article at: <http://dx.doi.org/10.21037/ls.2019.08.04>

We read with great interest the work of Matsumoto *et al.*, “Laparoscopic versus open distal pancreatectomy for benign and low-grade malignant lesions of the pancreas: a single-center comparative study” that was published in *Surgery Today* (1). This article describes a retrospective comparison of laparoscopic distal pancreatectomies (LDP) *vs.* open distal pancreatectomies (ODP) from a prospectively maintained database, performed in a single centre in Osaka, Japan. Consecutive patients (n=67) operated during a little over a 5-year period were included. The exclusion criteria included pancreatic ductal adenocarcinoma (PDAC), non-functioning neuroendocrine tumours >1.5 cm, insulinoma >2.0 cm, chronic pancreatitis with severe inflammation and previous upper abdominal surgery. The aim of this study was to compare the two methods in patients with benign and low-grade malignant lesions in order to determine safety and efficacy of LDP.

Since the introduction of LDP in the 1990s there have been numerous reports suggesting its superiority over ODP in terms of reduced hospital stay and reduced perioperative bleeding (2,3). Furthermore, recent studies have suggested that LDP is at least as cost effective as ODP thereby adding to the growing evidence in favor of LDP (4). The lack of randomization and clear inclusion criteria has however been obvious and therefore the risk of selection bias has been high. In the only available RCT comparing minimally invasive distal pancreatectomy (MIDP) to ODP this selection bias was circumvented and the results from the LEOPARD trial indicate that the previously suggested benefits of MIDP actually exist (5).

Regarding MIDP for PDAC, the evidence is less clear although a recent retrospective multicenter study suggests same survival with the minimal invasive approach as with the open counterpart (6).

The study of Matsumoto *et al.* describes transition from ODP to LDP with the former being done exclusively during the early study period (January 2012 to May 2014), and the LDPs done during the later part (June 2014 and March 2017). A single surgeon who had done 40 LDPs before the start performed all the LDPs. The patient cohorts are similar regarding factors that might influence the outcomes such as lesion size, location in body or tail and body mass index.

As shown by de Rooij and co-workers in the LEOPARD trial, operative time was significantly longer in the LDP group but blood loss was reduced (5). It is however likely that the long operation time found by Matsumoto *et al.* will decrease with further experience of the laparoscopic approach.

The postoperative outcome reported by Matsumoto *et al.* were the same for LDP and ODP. Complication rate was low in both groups (6% major morbidity in the LDP group and 9% in the ODP group) and the occurrence of post pancreatectomy fistula grade B according to ISGPS was low as well (3% in ODP group and 9% in ODP group) (7). The authors speculate in a novel method to close the pancreatic stump as a possible explanation to the low fistula rate. The method consists of direct 4-0 sutures on the main pancreatic duct as well as 3-0 transpancreatic mattress sutures with reinforcement of Vicryl mesh (8). This could warrant a

prospective trial as none of the common methods used to close the pancreatic stump has been shown to be superior to the others.

Previous studies have failed to show difference in morbidity while hospital stay is usually reported shorter for LDP than for ODP. This was however not the case in this study. Furthermore, time to oral intake was not statistically reduced with the minimal invasive approach. When interpreting these results, the limited number of patients included must be kept in mind.

Early literature on LDP suggests that the method increases the possibility of spleen preserving procedure although this may be related to different use of LDP and ODP for PDAC (3). In this study however the rate of spleen preserving procedures was higher (although not significantly) in the ODP group. While the trend in distal pancreatectomy clearly goes towards more spleen preserving surgery the role of spleen preservation, in particular with the Warshaw method remains somewhat unclear and reports on spleen preservation are heterogenous and in general include limited number of patients (9).

With numerous retrospective series and meta-analysis, the evidence for MIDP being the golden standard for benign and low malignant lesions in the body and tail of the pancreas has accumulated despite only one prospective RCT being available. The study of Matsumoto *et al.* supports the safety and feasibility of LDP as shown earlier. What the study also indicates is that the introduction of LDP when done in benign and low malignant lesions is safe as has been demonstrated before (10).

The question that remains unanswered is how appropriate MIDP is in the settings of PDAC. Embarking on PDAC with minimal invasive approach is more debated in the surgical community and the available evidence is limited. In order to be able to resect PDAC with minimal invasive tools it is probably of importance to have confidence in applying the method to less aggressive disease and therefore the comparison of outcomes in patients with benign and low malignant lesions is of importance.

Currently there are RCTs ongoing or unpublished that will add to the knowledge about the proper use of MIDP for both benign lesions and PDAC. The LAPOP trial that has completed recruitment will provide additional insight about the use of LDP *vs.* ODP for all lesion types with primary endpoint being hospital stay (11). The DIPLOMA trial is recruiting patients with PDAC for randomized, patient blinded comparison of MIDP and ODP regarding radical resection as primary endpoint in 258 patients

(ISRCTN44897265). The, “Laparoscopic versus open distal pancreatectomy for pancreatic cancer: a multicenter randomized controlled trial” is recruiting 244 patients for comparison of LDP and ODP regarding 2-year overall survival as primary end point (NCT03957135). Finally, the LOPA trial is set (not recruiting) to investigate major complications in 100 patients randomized to LDP or ODP (NCT03747588).

In summary, the study of Matsumoto *et al.* adds to the growing evidence supporting the use of minimal invasive surgery for distal pancreatectomy in the settings of benign or low malignant lesions.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Laparoscopic Surgery*. The article did not undergo external peer review.

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/ls.2019.08.04>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Matsumoto I, Kamei K, Satoi S, et al. Laparoscopic versus open distal pancreatectomy for benign and low-grade malignant lesions of the pancreas: a single-center

- comparative study. *Surg Today* 2019;49:394-400.
2. Vijan SS, Ahmed KA, Harmsen WS, et al. Laparoscopic vs open distal pancreatectomy: a single-institution comparative study. *Arch Surg* 2010;145:616-21.
 3. Wellner UF, Lapshyn H, Bartsch DK, et al. Laparoscopic versus open distal pancreatectomy—a propensity score-matched analysis from the German StuDoQ | Pancreas registry. *Int J Colorectal Dis* 2017;32:273-80.
 4. Joechle K, Conrad C. Cost-effectiveness of minimally invasive pancreatic resection. *J Hepatobiliary Pancreat Sci* 2018;25:291-8.
 5. de Rooij T, van Hilst J, van Santvoort H, et al. Minimally Invasive Versus Open Distal Pancreatectomy (LEOPARD): A Multicenter Patient-blinded Randomized Controlled Trial. *Ann Surg* 2019;269:2-9.
 6. van Hilst J, de Rooij T, Klompmaker S, et al. Minimally Invasive versus Open Distal Pancreatectomy for Ductal Adenocarcinoma (DIPLOMA): A Pan-European Propensity Score Matched Study. *Ann Surg* 2019;269:10-7.
 7. Bassi C, Marchegiani G, Dervenis C, et al. The 2016 update of the International Study Group (ISGPS) definition and grading of postoperative pancreatic fistula: 11 Years After. *Surgery* 2017;161:584-91.
 8. Matsumoto I, Takeyama Y, Kamei K, et al. Transpancreatic Mattress Suture with Vicryl Mesh Around the Stump During Distal Pancreatectomy: A Novel Technique for Preventing Postoperative Pancreatic Fistula. *J Am Coll Surg* 2016;223:e1-5.
 9. Edwin B, Sahakyan MA, Abu Hilal M, et al. Laparoscopic surgery for pancreatic neoplasms: the European association for endoscopic surgery clinical consensus conference. *Surg Endosc* 2017;31:2023-41.
 10. Hasselgren K, Halldestam I, Fraser MP, et al. Does the Introduction of Laparoscopic Distal Pancreatectomy Jeopardize Patient Safety and Well-Being? *Scand J Surg* 2016;105:223-7.
 11. Björnsson B, Sandström P, Larsson AL, et al. Laparoscopic versus open distal pancreatectomy (LAPOP): study protocol for a single center, nonblinded, randomized controlled trial. *Trials* 2019;20:356.

doi: 10.21037/ls.2019.08.04

Cite this article as: Björnsson B, Sandström P. Increasing evidence for minimally invasive approach to distal pancreatectomy. *Laparosc Surg* 2019;3:39.