



Is minimally invasive distal pancreatectomy a safe and effective oncologic resection?

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Comment on: Gavriilidis P, Roberts KJ, Sutcliffe RP. Comparison of robotic vs laparoscopic vs open distal pancreatectomy. A systematic review and network meta-analysis. *HPB (Oxford)* 2019;21:1268-76.

Received: 14 January 2020; Accepted: 30 January 2020; Published: 15 April 2020.

doi: 10.21037/ls.2020.02.01

View this article at: <http://dx.doi.org/10.21037/ls.2020.02.01>

Distal pancreatectomy with or without splenectomy is commonly the surgical resection of choice when treating benign, premalignant, and malignant lesions of the body and tail of the pancreas. The laparoscopic approach has been proven to be a safe and practical technique with improved short-term outcomes such as length of stay and operative blood loss when compared to an open approach (1-4). Although robotic distal pancreatectomy has not been studied as well due to being a more recent application of the technology towards pancreatic disease, thus far, the two variations of minimally invasive distal pancreatectomy appear to be comparable in terms of peri-operative outcomes (5). While the laparoscopic approach is more widely adopted among surgeons who perform this procedure, fewer surgeons have incorporated the robotic platform and thus any study of the robotic approach tends to be underpowered. Both techniques are applied for oncologic resections of pancreatic cancer with supportive data, although there has yet to be an evidence-based consensus on the effectiveness and outcomes of minimally invasive distal pancreatectomy in comparison to the classical open approach.

We have reviewed with interest the article “*Comparison of robotic vs. laparoscopic vs. open distal pancreatectomy. A systematic review and network meta-analysis*” by Gavriilidis *et al.* published in *HPB*. This study provided further support to the aforementioned benefits of the minimally invasive approach on short term perioperative outcomes. When compared to open distal pancreatectomy, patients who undergo laparoscopic or robotic distal pancreatectomy

experience less intraoperative blood loss and a shorter hospital length of stay. Also, the authors found no difference between open and minimally invasive distal pancreatectomy in terms of overall morbidity, including pancreatic fistula, which agrees with both previously published literature and our own institutional specific data (6). Interestingly, in the authors’ comparison of the robotic cohort to the laparoscopic cohort, they found that patients who underwent robotic distal pancreatectomy had even less intraoperative blood loss and a shorter hospital length of stay, in addition to lower conversion rate to an open procedure (7). At our center, we have found an association between the robotic approach and reduced postoperative pain scores with no differences in multimodal postoperative narcotic and non-narcotic analgesia, which could be the impetus to a shorter length of stay. However, there is currently no data in the literature to specifically corroborate this. By the authors’ own admission, the study’s robotic cohort was underpowered and these results appear to reflect more of a selection bias than a true difference in outcome based on surgical approach. Other studies have remarked that the robotic approach affords an increased instrument degree of freedom and dexterity allowing for more precise complex dissection and a higher rate of spleen preservation (8,9). Overall, the volume of published studies on robotic distal pancreatectomy is not as robust as the other approaches but is increasing with time. The recurring theme in many of these manuscripts ultimately is that many surgeons are still reluctant to use minimally invasive techniques for the perceived higher risk cases involving

pancreatic cancer.

This sentiment is responsible for the lack of consensus on the oncological efficiency of the minimally invasive distal pancreatectomy. Many studies have retrospectively compared the oncologic outcomes of the different techniques, and although the majority have so far not detected a significant difference in terms of both rates of R0 resection and lymph node yield, all agree that there is insufficient data to make a meaningful conclusion (1,4,10). Multiple studies have demonstrated that minimally invasive approaches are used for significantly smaller tumor sizes, once more suggesting a strong selection bias. Positive vascular involvement also tends to push surgeons towards the open approach. Frankly, we anticipate that it will be difficult to generate sufficient data, and even if there was, it will still be hard to make strong enough conclusions that surgeons would feel comfortable altering their practice.

However, proving that minimally invasive distal pancreatectomy is not only a safe but also comparable oncologic resection may offer great patient benefit. Thus, there have been many calls for prospective studies or randomized control trials to provide stronger data. Seoul National University Hospital is currently recruiting for a multicenter, randomized controlled trial comparing laparoscopic and open distal pancreatectomy for pancreatic cancer, with the primary outcome of overall 2-year survival (NCT03957135). Fudan University in Shanghai, China is recruiting for a similar randomized control trial, with their primary outcome being 2-year recurrence free survival, and with the secondary outcomes of 2-year overall survival, R0 resection rate, and detected lymph node number (NCT03792932). We anticipate with profound interest the results of these studies.

In conclusion, we commend Gavriilidis *et al.* for collating this dataset and for including the robotic approach in the discussion of minimally invasive distal pancreatectomy as an oncologic resection. We agree that both laparoscopic and robotic distal pancreatectomy are safe operations with proven benefits for short term perioperative outcomes. As the robotic platforms evolve technologically through both competition in commercially available devices and scientific innovation, an exponential adoption of the technique will ensue by surgeons. A continued narrative regarding the vetting and benchmarking of outcomes and effectiveness of minimally invasive distal pancreatectomy for pancreatic cancer will be paramount.

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.2020.02.01>). 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.

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doi: 10.21037/ls.2020.02.01

Cite this article as: Kim RC, Ceppa EP. Is minimally invasive distal pancreatectomy a safe and effective oncologic resection? *Laparosc Surg* 2020;4:21.