cohort sampling will be necessary to assess the generalizability of these initial results.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at https://doi.org/10.1016/j.urology.2019.05.049.

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EDITORIAL COMMENT

This prospective study compares a novel laparoscopic needle driver to the conventional robotic platform during partial nephrectomy (PN). Robotic PN (RPN) is currently utilized in 66% of PN performed in the United States.[1] The wristed instruments and ability to recreate the movements of the hand during open surgery have allowed RPN to maintain equivalent cancer cure, while providing shorter hospital stays and decreased blood loss compared to open surgery.[2] However, 1 major limitation of robotic surgery is the increased cost and limited availability of this technology.[3] Surgical robots come with large initial price tags, require expensive annual service contracts and costly disposables. Smaller hospitals and regions with less financial resources may not be able to afford the benefits provided by robotic surgery. However, laparoscopic PN (LPN) is more cost effective than RPN, saving $1066 dollars per case in a study by Hyams et al.[4] One of the main limitations of LPN is the lack of wristed instruments and the steep learning curve associated with this procedure.[5,6] Currently only 11% of PN in the United States are performed laparoscopically.[7] Development of a needle driver that would provide articulation to reproduce the advantages of robotic surgery at a lower cost would be a potential significant advantage.

This feasibility study, describes a novel wristed needle driver in a series of LPN patients. Certainly, the small sample size (20 patients) and the fact that all procedures were performed by a single surgeon is a limitation. The authors found that use of the novel needle driver was associated with higher blood loss (200 mL vs 50 mL, P= .03) compared to robotic surgery and the transfusion rate (30%) and positive margin rates (15%) were higher than those reported in some other series.[8,9] However, to the authors credit this was their initial experience with this technology and these outcomes will certainly improve with greater experience. A promising finding was that the warm ischemia time was similar between groups (LPN: 25.5 minutes vs RPN: 18.5 minutes, P= .36).

These authors should be congratulated for attempting to reduce the costs of PN. With healthcare consuming 18% of the gross domestic product in the United States, and 22% of the current budgetary expenses for 2018, devices like this experimental needle driver have the potential to lower the cost of minimally invasive PN.[10] In addition, this type of device could facilitate minimally invasive PN in regions where surgical robots are not available. Certainly, larger, multicenter, prospective trials will be required to determine whether this needle driver will provide equivalent outcomes to robotic surgery but at a lower cost. In addition, comparisons between the novel needle driver and conventional LPN will be necessary to determine whether this device truly can shorten the learning curve and improve the outcomes of LPN. Technologies such FelxDex have potential to make PN more readily available and allow for preservation of renal function to reduce risk of chronic kidney disease among this patient population.[11]

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AUTHOR REPLY

We thank the editors for their thoughtful comments regarding our study.[1] These authors correctly note that robotic surgery has improved postoperative outcomes including shorter length of stay, decreased blood loss while sustaining curative extirpation for partial nephrectomy (PN) as compared to an open technique.[2,3] The rapid adoption of robotic surgery since the Food and Drug Administration approval of the Intuitive Surgical platform in 2000 has accelerated the utilization of minimally invasive techniques for PN. However, this transition should not halt innovation and utilization with laparoscopic instruments in renal surgery.

As healthcare providers, it is important to be good stewards of healthcare resource utilization, balancing the potential benefits of novel innovations while also being cognizant of the costs associated with these new technologies.[4] In this study we have proposed the use of a new technology in a resource limited hospital to perform a more minimally invasive technique for PN.

The authors point out that laparoscopic PN can be very technically challenging and is associated with a significant learning curve. Given that our study represents our initial experience with this technology, it is likely that these cases represent outcomes within the learning curve for this technology. In the prostate cancer literature, 1 study of laparoscopic radical prostatectomy demonstrated that the 5-year risk of recurrence decreased from 17% to 16% to 9% for patients treated by surgeons with 10, 250, and 750 prior laparoscopic procedures.[5] In this study we report on the first 10 patients undergoing LPN with an articulating instrument assistance completed by 1 single surgeon. Further study to examine perioperative and postoperative outcomes with additional surgical volume will be necessary to further evaluate these initial results.

Larger and multi-institutional studies will be needed to assess the future utilization of articulating laparoscopic instruments such as this technology. We agree that a direct comparison to laparoscopic instruments would be ideal to assess the proposed benefit suggested in our study. However, in hospitals without access to a robotic surgical system there will likely remain a selection bias for patients undergoing laparoscopic PN with traditional laparoscopic instruments, in that the simple cases will undergo LPN and more complex cases will undergo open PN. Therefore, careful consideration will need to be made to match complexity parameters like RENAL Nephrometry scores used in this study to compare traditional LPN to LPN with articulating instruments.[6]