Author’s response to reviews

Title: The institutional learning curve is associated with survival outcomes of robotic radical hysterectomy for early-stage cervical cancer-A retrospective study

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Thank you for the important and valuable comments on our manuscript. We have revised our manuscript according to the reviewer’s comments, as follows.

Sveinung Wergeland Sørbye, Ph.D., M.D. (Reviewer 1):
Comments:
There has been a rapid and widespread adoption of the robotic surgical system with a lag in the development of a comprehensive training and credentialing framework. A structured training curriculum is suggested incorporating evidence-based training techniques and benchmarks for progress. This usually involves sequential progression from observation, case assisting, acquisition of basic robotic skills in the dry and wet lab setting along with achievement of individual and team-based non-technical skills, modular console training under supervision, and finally independent practice.
Gynecologic oncologists performing robotic radical hysterectomy (RRH) need training and a high volume of surgeries to become highly skilled. In 2006-2012 there were 77 women in RRH1, corresponding to 11 women each year or one surgery every month. If there surgeries are performed by different gynecologic oncologists, the volume of each surgeon is very low. It is recommended that every surgeon perform at least 50 robot procedures every year to maintain a high level. If a surgeon has performed less than 20 procedures in the previous 12 months, the surgeon should perform simulator training.
In page 5, line 84-86, it is written «All the radical hysterectomies were performed by board-certified..."
gynecologic oncologists at a single tertiary referral hospital and assisted by gynecologic oncology fellows.

How many different gynecologic oncologists were involved in the surgeries of the 310 women. Did the same board-certified gynecologist oncologists perform both abdominal radical hysterectomy (ARH) and robotic radical hysterectomy (RRH)? How many robot procedures every year did each gynecologic oncologists perform? Did the same gynecologic oncologists perform the surgeries in the two periods (2006-2012 and 2013-2018)?

→ The same board-certified six gynecologic oncologists performed both ARH and RRH in the two periods. We revised the Method section.

Different surgeons have different skills, and «the institutional learning curve» may be reflecting the learning curve of each surgeon performing robot procedures. Usually high-volume hospitals have better surgical outcomes. Maybe complex cancer surgery should be centralized to large hospitals to sustain quality?

→ That's a good point. I agree with you in general. In order to carry out a complex cancer surgery, the surgeon need to be trained at the large hospitals which have completed the initial learning curve.

Edward Lloyd Trimble, MD (Reviewer 2): 1. I recommend that you add to the background or methods section the number of surgeons at your institution qualified for robotic surgery for cervical cancer over the years in question, as well as the requirements for such certification.

→ The same board-certified six gynecologic oncologists performed both ARH and RRH. As suggested, we revised the Method section.

2. I was not able to find in your statistical plans how you have handled the fact that patients in the RRH2 cohort have shorter follow-up times than those in RRH1 or many of the patients in the ARH cohort.

→ Although follow-up times vary between the three groups, even RRH2 cohort which had the shortest follow-up period is considered to be appropriate for PFS comparisons as more than half of patients in RRH2 cohort was followed up for more than five years.

3. I was unable to follow your arguments on page 8, lines 159-166. Please clarify.

→ Thank you for the valuable comment. We revised the sentences to increase the readability.

4. On page 9, you state on line 170 that a well-controlled trial is needed. On line 184-185 you state that the mode of surgery should be determined according to each surgeon's proficiency. Please reconcile these two statements.

→ The well-controlled trial for comparing modes of surgery is hard to be performed due to ethical or practical issues. I think meta-study is recommended by analyzing a variety of exploratory studies including our study. The Conclusions section was revised.

We again thank the editor and reviewers for the consideration of our manuscript. We hope that this revised manuscript is now acceptable for publication in your journal.

Thank you for your kind attention.

Very respectfully,
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