Peer Review File

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Reviewer A

Comment 1: Unfortunately, it is difficult to insist the usefulness of the mentorship program after reading it. First, there was no differences between the two surgeons (the mentor and the mentee) about learning curve of the robotic surgery using CUSUM analysis. We expect that the mentorship program would have facilitated the learning curve if it had been effective. Second, the significant differences about perioperative results might be attributed to just individual surgical skills because the number of patients included was too small.

Reply 1: We really appreciate your feedback. We consider the mentorship program has been effective since a reduction in the operative morbidity and surgical failure rates have been observed among mentee cases despite she has less overall surgical experience. We think that the operative time alone is not sufficient for a multidimensional analysis of the learning curve. The technical competence should consider some other surgical outcomes, including the mortality, morbidity, and conversion rate. In our opinion safety is the key point regarding surgical learning curve. We consider that the mentor learnt by himself how to deal with challenging issues during robotic anatomical resections such as parenchyma manipulation or vessel and bronchial dissection and he made some mistakes (surgical failure) during this learning. Later, he was able to transmit this learning to the mentee in such a way that she could avoid making the same mistakes that the mentor made before reducing her surgical failure rate. Moreover, from our point of view, operative time is more dependent on individual surgical skills and expertise level, in fact median operative time was lower in the mentor cases compared to mentee cases. However, postoperative outcomes, especially surgical failure, is more related to technical aspects of the surgery than can be controlled during the surgery and improved with mentoring. The fact that there was no reduction of operative time indicates that the adoption of the robotic technique requires each surgeon goes through a complete learning curve, while mentoring facilitates a safety adoption of the technique.

Changes in the text: In the discussion (second paragraph), we added: “Although operative times may vary with the complexity of the individual cases, individual surgical skills and expertise level, chronological plots showed that surgical time decreased along time in the case series of both surgeons”.

Comment 2: Minor revision: Schema about the placement of each port can be useful for readers to understand.

Reply 2: We completely agree with the reviewer. We have added and surgical image.

Changes in the text: We added figure 1 in the section “operative technique” in methods.

Reviewer B

Comment 1: In surgical training, what is called, water-fall type mentor system is very concise and we usually apply in most clinical training. In this system, mentees have a superiority in avoiding critical complications because they have already been encountered in mentors' operations or clinical courses. From these background, well-learned mentees

have experienced difficult situations before adopting new procedures; therefore, this results are very natural and obvious.

Reply 1: We completely agree with the reviewer´s comment. Although some degree of decrease of postoperative morbidity and surgical failure could be expected based on previous experience of mentee as assistant, we consider that the improvement of postoperative outcomes could also be attributed to the mentorship activities (planification of the surgery, feedback during surgery…) since robotic approach has some particularities difficult to learn just by observation. We think that the mentor learnt by himself how to deal with challenging issues during robotic anatomical resections such as parenchyma manipulation or vessel and bronchial dissection and he made some mistakes (surgical failure) during this learning. Later, he was able to transmit this learning to the mentee in such a way that she could avoid making the same mistakes that the mentor made before reducing her surgical failure rate. We also demonstrated that the adoption of the technique requires each surgeon goes through a complete learning curve despite the mentorship program. We consider that robotic technique although sharing some features with VATS, has some particularities such as instrument manipulation and absence of tactile feedback that must be learned and mastered by surgeons by themself and that requires training and completing a learning curve in terms of operative time. However, this learning process could be safer if a mentorship program if applied.

Changes in the text: No changes.

Comment 2: If possible, current CUCUM of both the mentor and the mentee should be presented.

Reply 2: Since the study is focus on only in learning curve period, which has been stablish in several studies around case 30, we do not find relevant to present CUSUM graph of all the complete series of cases operated by the mentor and the mentee. The presented CUSUM graph demonstrated a clear decrease in operative time after the 27th procedure. Moreover, nowadays the number of robotic anatomical segmentectomies performed by the mentee is around 45 cases. However the mentor has performed >130 robotic procedures to date and, as previously metioned by the reviewer, we consider that this information could relevant, so it was added to the manuscript.

Changes in the text: In the methods section (surgeon´s expertise - first paragraph) we added: During the mentee´s learning period, the mentor continued performing robotic procedures and at the end of June 2021 his current surgical skills included >100 anatomical pulmonary resections with increasing levels of complexity and >30 mediastinal surgeries.

Comment 3: Waterfall plots are also recommended.

Reply 3: Regarding the use of waterfall plots, we do not consider they reflect as accurately as CUSUM graph the learning curve process. The CUSUM method is a control chart to calculate cumulative sums, which has been used to evaluate a practitioner's initial and continued successful performance of procedures the main advantages of the CUSUM method are independence from the sample size and effectiveness in detecting small continuous shifts in the whole system. To the best of our knowledge, waterfall plots are generally used to visually convey the benefit seen in cancer clinical trials and they may provide doctors with an approximation of how well a therapy is likely to work. For this reason, they can exaggerate true response rate.

Changes in the text: No changes.

Comment 4: The mentor had been encountered difficult situations and the mentee had seen them as an assistant; it is a big advantage for the mentee. You should present current surgical skills of the mentor is well-steaped.

Reply 4: Effectively, the mentee was the assistant of the mentor until he completed his learning curve and he continued operating robotic cases once the mentee started her learning process. So that, his experience continued increasing. The theoretical advantage of the mentee is mentioned as a limitation in the discussion section. At the end of the mentee´s surgical learning period, current surgical skills of mentor were > 100 anatomical lung resection and >30 mediastinal surgeries.

Changes in the text: In the methods section (surgeon´s expertise - first paragraph) we added: During the mentee´s learning period, the mentor continued performing robotic procedures and at the end of June 2021 his current surgical skills included >100 anatomical pulmonary resections with increasing levels of complexity and >30 mediastinal surgeries.

Comment 5: How was the device or hard of robotic surgery? These have also progressed in this period: therefore, you have to mention.

Reply 5: Related to complexity of cases included in the analysis, as mentor and mentee learning period did not coincide at the same time, we consider bias coming from subjective evaluation of the expected technical complexity of the operation were similar in both surgeons. However, it is true that mentor continued performing robotic procedures and gaining robotic expertise in more complex cases during the mentee´s learning period. Additionally, we consider that main tumoral features that determines surgical complexity are tumoral size and lymph node involvement and they do not differ among both series.

Changes in the text: In the methods section (surgeon´s expertise - first paragraph) we added: During the mentee´s learning period, the mentor continued performing robotic procedures and at the end of June 2021 his current surgical skills included >100 anatomical pulmonary resections with increasing levels of complexity and >30 mediastinal surgeries. In the results section (table 1) we added information related to lymph node involvement in both series (cN1-N2 and pN1-N2). In the discussion section (limitation – last paragraph) we added: Thirdly, although baseline characteristics of patients were similar in both groups, technical complexity was not assessed. However, as mentor and mentee learning period did not coincide at the same time, we consider bias coming from subjective evaluation of the expected technical complexity of the operation were similar in both surgeons. Moreover, some features strongly associated to technical complexity such as tumoral size and lymph node involvement did not differ among groups.

Reviewer C

Comment 1: It’s an interesting and well written article about a major topic dealing with surgical mentorship. As it is said, "never the first time on the patient". But how to do this when it is estimated that the learning curve of a technique is more than 30 procedures. The elements evaluated are relevant, particularly concerning the rate of postoperative complications. The evaluation of the per operative time is relevant but often discussed.

Reply 1: We completely agree the reviewer. In our opinion, learning curves must be evaluated from a multidimensional point of view (not only operative time). We consider that the most important aspect of the learning curve is safety and regarding this consideration, mentorship activities could guarantee a safety adoption of the technique. The fact that mentorship program was not associated to a no reduction of operative time indicates that the adoption of the robotic technique requires each surgeon goes through a complete learning curve.

Changes in the text: No changes.

Comment 2: About cases characteristics it might be interesting to present cTNM and pTNM, and maybe T and N upstaging. Because, to correctly start a robotic program "easy cases" should be done", in order to become familiar with the robotic tool, and to gain confidence. Knowing how to choose cases to start RATS could be influenced by the mentor. Were there easier cases for the mentee? Indeed, the interest of the robotic tool is to be able to do more complex cases than in video but not at

Reply 2: We agree with this suggestion. We consider that most relevant features related to surgical complexity are the size of the tumour and the lymph node involvement. Since not all cases were lung cancer cases, we consider that pN1-N2 would be more relevant to present. These characteristics were similar in both groups. Related to cases complexity, as mentor and mentee learning period did not coincide at the same time, we consider bias coming from subjective evaluation of the expected technical complexity of the operation were similar in both approaches. We also agree with the reviewer that robotic tool is to be able to do more complex cases than in VATS, especially complex segmentectomies or sleeve resections. In fact, after achieving the learning curve, both surgeons started to perform this kind of procedures that maybe also need to complete a learning curve to be mastered.

Changes in the text: We added in table 1 the lymph node status (clinical and pathological). In the discussion section (limitations – last paragraph) we also added: Thirdly, although baseline characteristics of patients were similar in both groups, technical complexity was not assessed. However, as mentor and mentee learning period did not coincide at the same time, we consider bias coming from subjective evaluation of the expected technical complexity of the operation were similar in both surgeons. Moreover, some features strongly associated to technical complexity such as tumoral size and lymph node involvement did not differ among groups.