Peer Review File

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Reviewer A

I think this is a well-organized review of the current role of RATS in primary lung cancer treatment.

The authors performed a Narrative review and divided the parts into The Changing Trend: from Lobectomy to Segmentectomy, The Quality of Lymphadenectomy, Robotic Surgery for Complex Resections, Postoperative outcomes, and Next frontier in Robotic Surgery.

I think these things have provided the reader with systematic and useful information.

As a minor point, it seems that the expression stage one in line 167 should be changed to stage I.

Also, in the Next frontier in Robotic Surgery part, it would be nice if there was one more figure explaining da Vinci®, Versius®, HUGO®, etc. with photo images.

Thanks for the good review paper.

Comment 1: "…it seems that the expression stage one in line 167 should be changed to stage I."

Reply 1: We appreciate the correction.

Changes in the text: We have modified our text as advised (see page 07, line 173)

Comment 2: "Also, in the Next frontier in Robotic Surgery part, it would be nice if there was one more figure explaining da Vinci®, Versius®, HUGO®, etc. with photo images."

Reply 2: We appreciate the suggestion and provided a picture representing both da Vinci Xi and CMR Versius since the major difference between platforms could be resumed by those two.

Changes in the text: We added a new image (Figure 4).

Reviewer B

Maybe you can give more strength to your conclusions with recent reviews and meta-analyses.
Today you need to discuss about the cost of the surgery, because RATS is not the "cheaper option".
To Discuss the learning curve could also be interesting.

Comment 1: “Lymph node number is an individual specificity and not only depending on surgeon's technical skills.”
Reply 1: We appreciate the comment and exclude it, making the text clearer.
Changes in the text: Please see page 02, Line 38

Comment 2: “Can you cite a more recent researcher if you mention two decades of safety research about RATS lung resection for example?”
Reply 2: We added an updated systematic review as reference in that part and used in the text ahead.

Changes in the text: Please see page 03, Line 49

Comment 3: “Can you give more recent data?”
Reply 3: Unfortunately, that is the most actual published data of its kind. We have some unpublished data that is impossible to report now.
Changes in the text: No changes in the text

Comment 4:” Moreover many surgeons experienced some difficulties in performing VATS lobectomy due to the ergonomy, lack of wristed instruments.... cf Seder CW; Ann Thoracic Surg; 2016”
Reply 4: Thanks for the suggestion.
Changes in the text: We changed the text on page 03 line 61

Comment 5:” Moreover, RATS allows surgeon to mimic open surgery, it's like "back to basic" or fissureless approach is a necessary adaptation to perform a lobectomy by

VATS”

Reply 5: We complete the rationale following the instruction.

Changes in the text: Please see page 04 and line 74.

Comment 6: “Regarding international guidelines, RATS as VATS and all minimal invasive approach are accepted and recommended only for early-stage lung cancer but for extended indication it's still reserved to experienced team. ESMO; NCCN; ACCP; ESTS; ....”

Reply 6: We made the text clear.

Changes in the text: Please see page 04 and line 77.

Comment 7: “Can you explain this? There is the surgical and medical litterature about 8 to 10 weel conducted systematic reviews and meta-analysis about RATS compared to VATS or Open concerning short- and and long-term outcomes with serious data.”

Reply 7: The proposed paper is a narrative review. It does not include a systematic paper evaluation, or a statistic analysis required on systematic reviews and meta-analysis. It does not mean that the paper excludes systematic reviews and meta-analysis form it references.

Changes in the text: Please see page 05, line 92.

Comment 8: “This paragraph is well writen and it's focused on a debated topic. References are interesting, but it could be helped recent litterature, and meta-analyses with also long-term results

cf Ma J et al. in BMC Cancer 2021 for example.”

Reply 8: We appreciate the comment. The systematic review by Ma J et al was added as reference on that topic and in others ahead.

Changes in the text: Please, for this topic see page 07 and line 145.

Comment 9: “ Cf multimodal imaging segmentectomy”

Reply 9: We appreciate the suggestion an include the term.

Changes in the text: please see page 09, Line 190

Comment 10: “This is one of the most important and usefull tool, the possibility to use

ICG with the same camera. Please give more details about two possibilities allow by ICG: Localize the tumor and identify he intersegmental plane.”
Reply 10: We added an image exemplifying the possibility to localize the tumor. The intersegmental plane identification is described in the final section.
Changes in the text: Please see Figure 1 and Figure 5.

Comment 11: “ this parapgraph is well constructed. It could be helped by meta-anaylses. You need also to make a link between lymph node up stagging and long term survival in reported articles. Because in many of them if the lymph node upstaging is higher by RATS than by VATS the isn't any long term consequences.”
Reply 11: Thanks for the consideration. It’s an interesting point. We added some text to discuss that. Correlate long-term outcomes with those data are quite difficult since there is a lack of time between the natural evolution of adjuvant treatments and the actual reported data regarding upstaging.
Changes in the text: please see page 10, Line 207

Comment 12: “This topic is very debated. You should focus on the main quality indicator wich is the upstaging rate and the number of areas eplored but not on the number of removed lymph node.”
Reply 12: Thanks for the comment. We tried to bring to readers all detailed data reported in most papers. The number of lymph nodes is a frequently reported variable. We totally agree with this variable limitation and its secondary importance in front of upstaging, because of that we added that information in a clear way
Changes in the text: Please see page 10 Line 207.

Comment 13: “ Cf cmment”
Reply 13: Please check the past comment.
Changes in the text: No changes here

Comment 14: “ Strong conclusion. RATS or VATS and Open are just "the way to do it". But for sure, it's quite easy by RATS. But it depends on surgeon's skills”
Reply 14: Thanks for the comment.
Changes in the text: No changes here

Comment 15: “ Interesting conclusion. Maybe complex resections are not only sleeve resections; Need to also include complex segmentecomies; chest wall resections. Nevertheless, in reports and articles dealing with complex resections, authors used to mention that it's for advancend skilled surgeons, need to rewrite it.”

Reply 15: Thanks for the comment. For sure complex resections are more than sleeve resections, however it represents the full capacity of vascular control what is fundamental for others complex procedures such as large tumors with chest wall invasion. We also reserved a full section for segmentectomies and discussed about the complex ones. We also complete the text and make it more clear.

Changes in the text: Please see page 16, line 350.

Comment 16: “Dealing with short-term outcomes could be "tricky" because including patients operated during RATS learning curve compared to other patients operated by VATS (learned many years before) lead some bias.”

Reply 16: Thanks for the comment. We completely agree with that consideration. However, in that case, the presented data confirms results consistent with the general literature, which reinforces the safety and effectiveness of the method even at earlier stages of the learning curve.

Changes in the text: No changes here

Comment 17: “You can cite other reviews, actually few articles and reports have showed a difference concerning long-term outcomes benefits”

Reply 17: Thanks for the comment, we added at least more four references in this section.

Changes in the text: Please, see Table 3 and page 20 and Line 347

Comment 18: “ Interesting paragraph according futur robotic tools.”

Reply 18: Thanks for the comment

Changes in the text: No changes here

Comment 19: “One of the most debated topic deated concerning RATS is it's cost? Can you bring some data. Moreover, what about eduction and the learning curve and do you

have articles dealing with the quality of life of patients operated by RATS compared to VATS?"

Reply 19: Thanks for the comment. We added a paragraph regarding cost with a micro-cost analysis paper and a cost-efficacy by QALY analysis.

Changes in the text: Please see page 22, line 483.

Reviewer C

The implementation of robot-assisted thoracic surgery is flourishing worldwide. In the revised article, you give an overview of the origin, evolution and future of RATS, which I congratulate you on.

I would only suggest adding a mid-term evaluation of how RATS will be implemented around the world. Would it be for selected cases or, would it immediately take over VATS?

Comment 1: "I would only suggest adding a mid-term evaluation of how RATS will be implemented around the world. Would it be for selected cases or, would it immediately take over VATS?"

Reply 1: Thanks for the comment. The mid-term implementation of RATS surgery worldwide is a summary of factors. In our review, we describe some key points for that such as the reliability in complex resections (segmentectomies, sleeves…), adjunct technologies for the surgery digitization process, and cost. In all those points we describe characteristics that are influencing the migration from VATS to RATS.

Changes in the text: We made some changes in text that could made that points clearer. Please see page 16 and line 351, page 22, line 483.

Reviewer D

In this review article, the authors discussed robotic lung resection for lung cancer treatment focusing on sublobar resection, quality of lymph node dissection, complex

thoracic surgery, and postoperative outcomes based on published data. This is an informative review to summarize critical issues in the field of thoracic surgery. The authors should address the following minor issues before publication.

1. It would be better to describe not only keywords but also the selection process of articles, including the initial number of searched articles and the number of excluded articles with a reason for exclusion.
2. In the Abstract, the authors should use appropriate abbreviations. RATS would be robotic-assisted thoracic surgery, and VATS would be video-assisted thoracic surgery.

Comment 1: "It would be better to describe not only keywords but also the selection process of articles, including the initial number of searched articles and the number of excluded articles with a reason for exclusion."
Reply 1: We appreciate the suggestion. The attempt in that paper was not to perform a systematic review following the PRISMA statement and the Cochrane recommendations. We aim to conduct a narrative review embracing the most actually important point of robotic surgery on primary lung cancer treatment. We believe that a systematic review would provide a higher power of scientific evidence but narrow the discussion to an even more specific theme. Because of that we did not attempt to report in detail the criteria for selection, inclusion, and exclusion of the cited papers. However, we strongly agree with the reviewer about the importance to detail more clearly those steps to improve reliability and follow ethical scientific transparency.
Changes in the text: We make changes in the text. Please see page 5 and line 99-106.

Comment 2: "In the Abstract, the authors should use appropriate abbreviations. RATS would be robotic-assisted thoracic surgery, and VATS would be video-assisted thoracic surgery."
Reply 2: Thanks for the correction. We totally agree with the nomenclature.
Changes in the text: We made changes in the text, please see page 02, line 23 and 34).

Reviewer E

Comment 1: "L. 385: Could you elaborate more about the learning curve and transition

from VATS to RATS as previously analyzed by Cerfolio et al ?"

Reply 1: Thanks for the comment. We discuss the learning curve of robotic in the context of the platform dissemination and the possibilities to perform more complex surgeries by a minimal invasive way.

Changes in the text: Please see page 03, Line 60-70, page 16 lines 350-362

Comment 2: "The benefits of RATS were very well elaborated in this review but what about the limitations and selection criteria of RATS ."

Reply 2: We really appreciate the comment. The intention of the paper is to report actual role of robotic platform in oncological treatment of primary lung cancer. We do not attempt to perform a comparative analysis between VATS and RATS. Regarding outcomes, look for a RATS superiority is quite a limited point of view since both methods are minimal invasive and we should not expect the same amount of benefit we found when comparing VATS against open. RATS major point is the possibility to interpose a machine between surgeon and patient providing the capacity to add new features and perhaps, through that, improve future results. We make those considerations during all the sections. The major limitation of RATS against VATS is cost and we added a paragraph about it.

Changes in the text: Please check page 22, Line 483

Comment 3: "L323-327: If feasible and safe MIS should always be considered first. The choice of the technique should always be based on the experience of the surgical team. Please modify this passage."

Reply 3: Thanks for the comment. We completely agree with that consideration. We make it clear during the complex resection section and also in the lymph node resection section. We added some new paragraphs to make it more clear

Changes in the text: Please see page 16, Line 350-361

Comment 4: "I would recommend to include a paragraph about the handling of intraoperative emergency situations."

Reply 4: Thanks for the comment, it's a very interesting topic. However, since the review theme is about the actual role of robotic platform in oncological treatment of primary lung cancer, we do not reserve a full topic to describe the management of

intraoperative bleeding. Therefore, we make considerations regarding the need of bedside team training for catastrophic situations.

Changes in the text: please see page 16, Line 350-361

Comment 5: “Line 406: change "than" into "them"”

Reply 5: Thanks for the correction. We really appreciate it.

Changes in the text: Please see page 20, Line 439