

Peer review file

Article information: <https://dx.doi.org/10.21037/jtd-21-1397>

Reviewer A

General comments:

Actual topic, sufficient size of the analyzed series. Clear study design with correctly presented and discussed data and study limitations. The presented data could enrich the existing evidence about this topic.

The major concern relates to the impossibility to perform a precise intergroup comparison, because one of the groups was in fact a “mix” group, including patients in whom at least a part of the operation was done using by both techniques that were initially designed to be compared.

Furthermore, one of the major issues related to this topic – conclusions about the postoperative lung function after each of the analyzed techniques are not possible because of the absence of the postoperative lung function.

The authors correctly addressed these limitations.

The overall message is quite clear, but the practical benefit is not so important.

Specific comments:

Abstract

Comment 1) Methods section, lines 35-36

Existing: “... a subset analysis was

36 performed based on the type of segmentectomy (common or uncommon).”

Comment: please clarify what is “common” und what “uncommon”. It is clear to me what the authors mean, they explained it later in the text, but it should be upfront clarified

Reply 1) Thank you for your suggestion. Definition of types of segmentectomy was added in the abstract section of the revised manuscript.

Change in the text 1) Please see lines 37-39 in the abstract of the revised manuscript.

Comment 2) Results section, lines 39-40

Existing: "... incidence 40 of postoperative 3 days \leq drainage

Suggestion: "... incidence 40 of postoperative \leq 3 days drainage

The same correction should be made throughout the entire manuscript

Reply 2) Thank you for your comments. We consider postoperative 3 days \leq drainage means that duration of drainage continues for 3 days or more while postoperative \leq 3 days does that duration of drainage continues for 3 days or less. We would like to insist that the incidence of the patients requiring longer postoperative drainage was "reduced". Therefore, we think postoperative 3 days \leq drainage is correct expression. Is it wrong?

Change in the text 2) No change.

Comment 3) Main text

Patients and methods section

Existing: "... we conducted receiver 105 operating characteristic (ROC) curve analysis using the device used to divide the intersegmental plane as the dependent variable..."

Suggestion: in order to make a sentence more clear:

"... we conducted receiver105 operating characteristic (ROC) curve analysis with the device used to divide the intersegmental plane as the dependent variable..."

Reply 3) Thank you for your reasonable suggestion. We revised the sentence as you suggested.

Change in the text 3) Please see lines 118-119 in the patients and methods section of the revised manuscript.

Comment 4) Lines 136-137

Existing: "...in the electrocautery group, the intersegmental plane was divided using electrocautery in the superficial lung parenchyma and staples in the deep parenchyma."

Comment: it means that electrocautery group was in fact "combined group". It is good that the authors clarified this point that could have some input to the main message of the paper. In other words, in the entire analysed group, in a majority of patients staplers were used at least to some extent. I wonder whether the name of this group should be changed into "combined" or not.

Reply 4) We apologize my confusing expression of the electrocautery cutting. In electrocautery group, at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients while an intersegmental plane was completely

divided using stapler in stapler group. Therefore, we changed the confusing sentence as below.

Change in the text 4) We added the sentences “at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients in the electrocautery group. Rest of the deep parenchyma was divided by staples” on lines 165-167 in surgical procedure section of the revised manuscript.

Comment 5) Lines 160-161

Existing: “... The ratios of actual and predicted lung volumes in the stapler and electrocautery groups were compared. “

Comment: In the discussion, the authors say that “data on postoperative pulmonary function were not collected in the present study”. The lung predicted postoperative lung function parameters as variables to be analysed make sense only if there is possibility to compare the predicted and actual postoperative value. The term “actual” is commonly used to depict the measured value. The way the author report “actual: predicted lung volumes” brings the confusion, because the first association of the reader refer to actual (measured) postoperative value, that in fact does not exist. Please clarify in Methods section that no postoperative lung function measurement was done. It is not clear what brings the preformed lung function parameter comparison. The practical benefit of such a comparison is low.

Reply 5) Thank you for your reasonable suggestion and we apologize my confusing expression. At first, we expressed “actual and predicted lung volume” more precisely. In addition, the sentence “Unfortunately, no postoperative lung function was measured in our department.” was added. Finally, we would like to insist that lung volume may reflect the lung function using the correlation between preoperative lung volume and pulmonary function.

Change in the text 5) We added the sentence “The ratios of postoperative actual (calculated by Ziosation 2) and predicted (calculated by the formula above) lung volumes in the stapler and electrocautery groups were compared.” on lines 195-198 in the calculation of the lung volume section of the revised manuscript. And, the sentence “Unfortunately, no postoperative lung function was measured in our department.” on lines 201-202 in the calculation of the lung volume section of the revised manuscript.

Reviewer B

The premise of your paper is very interesting, however, I have major concerns.

Comment 1) - Regarding the surgical technique: First of all, you specify in the paragraph regarding the surgical technique for the intersegmental plane division that for the stapling group you are using only staplers and for the electrocautery group you are using electrocautery for the "superficial parenchyma" and then stapling.

Reply 1) Thank you for your reasonable suggestion. In electrocautery group, at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients.

Change in the text 1) We added the sentences "at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients in the electrocautery group. Rest of the deep parenchyma was divided by staples" on lines 165-167 in surgical procedure section of the revised manuscript.

Comment 2) Second of all the technique employed is decided on the go by the surgeon which impacts the comparability of the groups.

Reply 2) Your comment is reasonable. This might make bias in this study. Therefore, the sentences describing it was added in the limitation section. Moreover, the choice of the device for division of an intersegmental plane depended on the surgical approach. Therefore, we also revised it.

Change in the text 2) Please see lines 335-340, which described the added limitations. Moreover, please see lines 142-148 and 158-163 in the surgical procedure section of the revised manuscript.

Comment 3) Describing the early stage of the dissection via electrocautery as "superficial parenchyma" is in my opinion too vague as we don't know exactly what is your anatomical limit and if the technique is reproduced identically between patients, this needs to be revised.

Reply 3) Thank you for your reasonable suggestion. In electrocautery group, at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients.

Change in the text 3) We added the sentences "at least, two-thirds of outer area in an

intersegmental plane was divided by electrocautery for any patients in the electrocautery group. Rest of the deep parenchyma was divided by staples” on lines 165-167 in surgical procedure section of the revised manuscript.

Comment 4) Regarding the lung function Endpoint, you are comparing the pre-operative functions and volume to the post-operative volume only.

Reply 4) Your question is appropriate. The most beneficial thing led by segmentectomy is maintaining postoperative lung function. However, our team did not usually examine postoperative lung function. Therefore, we described preoperative lung volume was significantly correlated with preoperative lung function in order to prove that lung volume can reflect lung function.

Change in the text 4) No change.

Reviewer C

I have some concerns with it.

Comment 1) the theme of your study brings no new aspects to the community

Reply 1) Thank you for your comment. The best way to divide an intersegmental plane is still controversial. We hope that results of the study will help the readers select the device for division of an intersegmental plane.

Change in the text 1) No change.

Comment 2) Your study is a retrospective study, why not as a prospective randomised study? It is not clear which patient was treated in the electrocauter group or in the stapler group. Who decided which patient was included in a group?

Reply 2) Your question is very reasonable. Our department introduced uniportal thoracoscopic pulmonary segmentectomy February 2019. In the uniportal thoracoscopic approach, only staples were used because of difficulty in achieving the countertraction necessary for electrocautery. On the contrary, electrocautery was mainly used in multiportal approach. This might make bias for the results in this study. Therefore, we added the sentence about it in the limitation.

Moreover, I am afraid it might be difficult to conduct a prospective randomized study

because using electrocautery is not suitable for division of an intersegmental plane during uniportal thoracoscopic approach which is our current standard.

Change in the text 2) Please see lines 142-146, 158-163 in the surgical procedures section and 335-340 in the limitations section of the revised manuscript.

Comment 3) The technical aspects for electrocautery were not mentioned also which stapler were used.

Reply 3) Your comment is appropriate. Therefore, the technical aspect you pointed was described more precisely in the revised manuscript.

Change in the text 3) We added the sentences “at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients in the electrocautery group. Rest of the deep parenchyma was divided by staples” lines on lines 165-167 in surgical procedure section of the revised manuscript.

Comment 4) What was the rationale for the use of fibrin glue?

Reply 4) Thank you for your comment.

We added the criteria of usage of the fibrin glue and intraoperative treatment for air leak.

Change in the text 4) Please see lines 167-174 in surgical procedures section of the revised manuscript.

Reviewer D

This a retrospective study of patients undergoing intersegmental plane division during pulmonary segmentectomy by using 2 techniques (staplers or electrocautery). This is study over a long period (15 years) including at the end few patients (<10 patients per year).

This is non-randomized trial. Some comments:

Comment 1) you should mention how many surgeons perform the procedure, at least rare for your service (few cases per year.)

Reply 1) Thank you for your comment. We added the information about how many surgeons performed the procedure.

Change in the text 1) Please see lines 146-148 in the surgical procedures section of the

revised manuscript.

Comment 2) No explanation why one technique was chosen over the other one. Surgeon's choice? Please explain.

Reply 2) I apologize my insufficient explanation about choice of the device. More precise explanations about it were added in the surgical procedures of the revised manuscript. Additionally, we also mentioned some additional limitations.

Change in the text 2) Please see lines 142-146, 158-163 in the surgical procedures section and 335-340 in the limitations section of the revised manuscript.

Comment 3) I appreciate that the volume did not change between the 2 techniques. However, as mentioned no comparison of pulmonary function but radiological software.

Reply 3) Unfortunately, our department did not usually measure postoperative pulmonary function as you said, which is considered the limitation of this retrospective study.

Change in the text 3) We added the sentence “Moreover, no postoperative pulmonary function, which was the most important for postoperative patients’ quality of life, was measured” on lines 344-345 in the limitations of the revised manuscript.

Comment 4) no mention on limitations about the period. I suppose that electrocautery was performed at the beginning of the experience and then switched to staplers.

Reply 4) Your comment is reasonable. We added the sentence “Fourth, staples were more frequently used in the latter of study period because staples were usually chosen in the uniportal approach, which might affect better perioperative outcomes in the stapler group.” in the limitations.

Change in the text 4) Please see lines 337-340 in the limitations section of the revised manuscript.

Reviewer E

In this paper, authors present a retrospective comparison between the use of electrocautery versus stapler to perform intersegmental plane’s division during sublobar resection.

Pulmonary sublobar resections represent one of most current attractive and relevant topic in thoracic surgery so this paper could be of interest in publication.

Nevertheless, several issues should be considered before the final decision:

Comment 1) The title of the paper (Comparison of stapler and electrocautery for division of the intersegmental plane in segmentectomy) does not contain any reference to the “thoracic surgery field” and, more specifically, to “lung segmentectomy” thus it may be confusing for the literature research: authors should consider to add the specificity “lung segmentectomy”.

Reply 1) Thank you for your suggestion. We modified the title.

Change in the text 1) Please see the title.

Comment 2) At page 10, line 126, authors describe their methods to identify intersegmental plane including inflation/deflation technique and IGC administration. Nevertheless, they also add “that the Intersegmental pulmonary veins in the hilum were used as landmarks to identify the intersegmental plane “. Is intersegmental veins targeting an ulterior manner of identify intersegmental plane division? Authors should clarify this point. Moreover, several studies reported how IGC identification is more precise than insufflation/deflation for intersegmental plane identification and may lead to reduced (or augmented) lung volume resection. As one of the comparators of the paper for the analysed population is lung volume, it is possible that the different method of intersegmental identification may lead to a different volume of resection: i.e. the quantity of parenchyma resected could be different in insufflation/deflation population than in the IGC population. Author should discuss this bias.

Reply 2) Thank you for giving me your appropriate questions. First, intersegmental pulmonary veins in the hilum were used as landmarks to identify the intersegmental plane when an intersegmental plane was not clearly identified using those techniques. Moreover, we added the sentence about the correlation between the technique to identify an intersegmental plane and postoperative lung volume in the discussion section of the revised manuscript.

Change in the text 2) Please see lines 154-155 and lines 310-317 of the discussion section of the revised manuscript.

Comment 3) At page 10, line 136 authors declare that “in the electrocautery group, the intersegmental plane was divided using electrocautery in the superficial lung parenchyma and staples in the deep parenchyma”. Even if this principle can be easily be assumed from expert surgeon in sublobar resection, some doubts about the scientific principle could be moved on: a) the definition of "superficial lung parenchyma" "deep parenchyma" is not standardized and thus it should be better described and clarify; b) In addition, if the authors have also used staplers to divide the intersegmental plane in electrocautery groups, is not the strength of comparison of the study drastically reduced? Authors should try to explain this paradox because, if not, the two population should be described as “electrocautery + stapler versus stapler only”.

Reply 3) Thank you for your comments.

1. We apologize my confusing expression of the electrocautery cutting. In electrocautery group, at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients while an intersegmental plane was completely divided using stapler in stapler group. Therefore, we changed the confusing sentence as below.

2. In the electrocautery group, most part of an intersegmental plane was divided by electrocautery although staples were used for division of central part of an intersegmental plane. The number of using staples was one or two at most. Therefore, nature of an intersegmental plane was strongly affected by electrocautery. Therefore, we divided all patients into “electrocautery” and “stapler” groups.

Change in the text 4)

1. We added the sentences “at least, two-thirds of outer area in an intersegmental plane was divided by electrocautery for any patients in the electrocautery group. Rest of the deep parenchyma was divided by staples” on lines 165-167 in surgical procedure section of the revised manuscript.

2. No change.

Comment 4) Authors should describe the indications they followed to propose sublobar resections (i.e. early stage NSLC, pulmonary metastasis, benign lesions...).

Reply 4) Thank you for your comment. We added the surgical indications.

Change in the text 4) Please see lines 130-139 in the revised manuscript.

Comment 5) In conclusion, although the study may arouse interest in a field still under investigation such as the division of the intersegmental plan for sublobar resection, several points need to be clarified before taking the final decision on publication. The small population analyzed, the use of 3 different surgical techniques (thoracotomy, multiport, uniport) to perform the resection, the analysis of an heterogeneous and not very specified group of patients, the inclusion of two different intersegmental plan identification techniques are bias that must be clarified by the authors in the necessary following review.

Reply 5) Your comment is appropriate. Those facts you pointed made the bias in this retrospective study. We considered they should be mentioned in the limitations.

Change in the text 5) Please see lines 334-340 in the limitations section of the revised manuscript.

Reviewer F

Since the similar oncologic results with regard to overall survival and recur-free survival of lung segmentectomy compared to lobectomy have recently presented in AATS meeting this year, I think that segmentectomy might be carried out more frequently to treat the patients with small sized lung cancer. The division or development of intersegmental plane would be one of several controversies regarding the technical aspect of lung segmentectomy.

Authors performed this study to determine the optimal method for division of the intersegmental plane during lung segmentectomy by comparing the use of staplers and electrocautery in terms of perioperative outcomes and residual lung volumes when developing intersegmental fissure.

Based on their results collected and analyzed from 156 patients from 2006 and 2020, they concluded that the use of staplers for division of the intersegmental plane was associated with better perioperative outcomes and similar postoperative remnant lung volumes and function.

I think that this article is well organized and can provide simple and intuitive results to readers.

Comment 1) But it is not possible to exclude the influence of the surgical methods or postoperative care since the data for this study were collected for relatively long period.

Reply 1) Your comment is appropriate. Therefore, we added the sentences about it in the limitation section of the revised manuscript.

Change in the text 1) Please see lines 335-340.

Comment 2) For example, I think that the methods for intersegmental plane identification should be addressed in each group.

Reply 2) Thank you for your suggestion. We added the results of the method to identify an intersegmental plane in the tables.

Change in the text 2) Please see revised table 1, 5, and 6.

Comment 3) And the method for pleurodesis for managing postoperative air leak should be mentioned.

Reply 3) Thank you for your suggestion.

We added the sentence about the criteria of postoperative pleurodesis in our department.

Change in the text 3) Please see lines 179-183.

Reviewer G

This is a manuscript that compares cautery and stapling in pulmonary segmentectomy.

This is a relevant and timely subject.

I greatly enjoyed reading this paper. I like the way the authors have conducted their study and written up the manuscript. I think that the text is clear, well-structured, I think that the results are certainly interesting and I think that the conclusions are valid. So the reader is left with a very practical take-away that may influence the way they conduct this type of surgery. My comments are minor, and they need not necessarily all be addressed, but I think that they may provide added value.

Comment 1) I would like to know what kind of staplers were used. In the same way, what type of energy device was used? I assume it was simple monopolar cautery (perhaps some information on settings)? Or did the authors also use advanced bipolar cautery for example?

Reply 1) Thank you for your comments. First, used staplers were usual type (ETHICON or MEDTRONIC). Second, we used only monopolar cautery.

Change in the text 1) Please see line 157 in the surgical procedures section of the revised manuscript.

Comment 2) It is not completely clear to me how surgical teams chose between one technique and another. Was there an evolution in their practice over time? Or was it just a question of a fixed preference among surgeons conducting the procedures?

Reply 2) I apologize my confusing expression about the criteria when we chose the device for division of an intersegmental plane. The selected device was correlated with the surgical approach including minithoracotomy, multiportal, or uniportal approach with a little surgeon's preference. We added the sentence about it in the surgical procedure section of the revised manuscript.

Change in the text 2) Please see lines 142-146 and 158-163 in the surgical procedures section of the revised manuscript.

Comment 3) In their interpretation of results, the authors should acknowledge that in fact (as they state in the « Methods » section), staplers were used in all cases. Can they give us some sense as to why they used this combination, and how the depth of dissection was determined in the « cautery » group, before the remaining parenchyma is stapled?

Reply 3) Your question is reasonable.

We wrote the division of an intersegmental plane in electrocautery group more precisely.

Change in the text 3) Please see lines 164-167.

Comment 4) Some information on the type and management of chest drainage systems would be welcome, as surgeons tend to vary widely as to their use of suction, and as digital systems appeared on the market during the study period. I am a bit surprised that the duration of « chest drainage » was an endpoint, as opposed to « air leak », which would seem the more relevant metric. Perhaps this is due to the retrospective nature of the study and limited information available in the charts. A brief comment would be welcome.

Reply 4) Thank you for your reasonable suggestions.

Our team did not use digital drainage system in order to reduce the medical cost.

Therefore, we did not know the exact time of cease of air leakage.

At the morning round, our team checked the postoperative air leakage and pleural drainage volume. The chest tube was removed after the air leakage had stopped, or the volume of pleural effusion was reduced to ≤ 300 ml within 24 hours at the round.

Change in the text 4) We added the sentence “At the morning round, our team checked the postoperative air leakage and pleural drainage volume.” on lines 175-176.

Comment 5) How do the authors perform an air seal-test in minimally invasive surgery?

Reply 5) Thank you for your comment. As a n air seal-test, our team usually examined whether air bubble occurred or not after filling the thoracic cavity with saline.

Change in the text) No change.

Comment 6) Miscellaneous comments:

Line 214: seems to be missing something: « significantly shorter or less operative (p=0,0025) ».

Reply 6) Thank you for bringing it to my attention.

We added “times”.

Change in the text 6) Please see line 252 in the results section of the revised manuscript.

Reviewer H

Congratulations to the authors on your successful and detailed analysis of the perioperative results of segmentectomy by using stapler and electrocautery to divide the intersegmental plane. The language is acceptable and the layout is fine. But I still have some questions and comments.

Comment 1) Line 114-115. Lingula belongs to the left upper lobe. The writing here will make people think it is in the left lower lobe.

Reply 1) Thank you for your suggestion. We revised the sentence.

Change in the text 1) Please see lines 127-128 in the patients and methods section of the revised manuscript.

Comment 2) Line 138. In the electrocautery group, do you do the seal test again after using fibrin glue and Neoveil? If air is still leaking, how do you deal with it? Are there

any criteria that must be met before closing the wound? It is a concern that whether the extent of air leakage of the two groups before closing the wound is at a similar level.

Reply 2) Thank you for your appropriate question.

When we found major air-leakage, we sutured the leak point with an absorbable string, which was performed in both groups. After the suture, the leak point was covered with fibrin glue and absorbable acid felt. However, in the electrocautery group, the coverage with fibrin glue and absorbable acid felt was performed for any patients to prevent delayed air leak even if the seal test revealed no air leak. Finally, we did not perform the seal test after the coverage. We totally revised the sentences about the treatment for air leak in a seal test.

Change in the text 2) Please see lines 167-174 in the surgical procedures section of the revised manuscript.

Comment 3) Line 144. "The chest tube was removed ... stopped, or the ...". I think the removal of the chest tube should meet both these two criteria at the same time. So the "or" used here might be changed to "and".

Reply 3) Thank you for your suggestion. We revised it.

Change in the text 3) Please see line 177.

Comment 4) Line 157-159 & Line 291-293. I have never used ZioStation2, so I am not sure about its function. Is ZioStation2 unable to calculate the proportion of lung volume that is expected to be resected from the preoperative computer tomography? If not, then I agree with your approach of using the estimation formula. But if it is possible, I think you should use the computer-calculated reserved volume to compare with the actual postoperative volume.

Reply 4) Your question is very reasonable. Unfortunately, we can calculate only total volume of the lung.

Change in the text 4) No change.

Reviewer I

I have the following comments.

Comment 1) The study period started from 2006 to 2020 and potentially resulted in time-trend bias. For example, stapler was introduced late than electrocautery and perhaps associated with more modern surgical techniques. The authors could provide the time information for the individual group to dispel readers' misgivings.

Reply 1) Your comment is reasonable. We added the sentence about the correlation between surgical approach and selected device for division of an intersegmental plane according to the timeline.

Change in the text 1) Please see lines 142-146 and 158-163 in the surgical procedures section of the revised manuscript.

Comment 2) Is neoadjuvant therapy one of exclusion criteria? or only patients with neoadjuvant radiotherapy was excluded? Preoperative treatments including chemotherapy, immunotherapy and target therapy could have impacts on tissue healing. I suggest exclude these patients or provide more detail information of neoadjuvant therapy of the individual group.

Reply 2) Thank you for your excellent suggestion. The patients undergoing neoadjuvant chemotherapy was excluded in this study.

Change in the text) We added the sentence describing that the patients undergoing neoadjuvant chemotherapy was excluded in this study on lines 100-101.

Comment3) Could the authors make further explanation about intentional/unintentional/others type of segmentectomy in Table 1? Why was there up to 59.7% patients in electrocautery group undergoing "other type" segmentectomy?

Reply 3) Your suggestion is very reasonable. In electrocautery group, the ratio of metastatic and benign diseases was higher than that in stapler group. As a result, the ratio of other type was also higher than that in stapler group.

Change in the text 3) No change.

Comment 4) I am curious about in what situation the surgeons from your hospital preferred electrocautery for intersegmental plane division.

Reply 4) I apologized my confusing expression. We revised the criteria of the choice in the device for division of an intersegmental plane.

Change in the text 4) Please see lines 142-146 and 158-163 in the surgical procedures

section of the revised manuscript.

Comment 5) The term “postoperative 3 days \cong drainage” could be corrected to “duration of postoperative drainage \leq 3 days” in both abstract and manuscript.

Reply 5) Thank you for your comments. We consider postoperative 3 days \cong drainage means that duration of drainage continues for 3 days or more while postoperative \leq 3 days does that duration of drainage continues for 3 days or less. We would like to insist that the incidence of the patients requiring longer postoperative drainage was “reduced”. Therefore, we think postoperative 3 days \cong drainage is correct expression. Is it wrong?
Change in the text 5) No change.

Comment 6) Undoubtedly, the surgeons preferred staplers instead of electrocautery cause of effectiveness and safety in the current era. Therefore, the findings are not particularly novel or unexpected, and though that does not diminish the authors' efforts, it does diminish the impact of the study.

Reply 6) Your opinion is reasonable. Although our team did not prefer using staples for division of an intersegmental plane, we gradually chose staples more frequently due to the change of surgical approach (from minithoracotomy or multiport to uniport). We consider that this is a limitation in this retrospective study, which was added in the limitation section of the revised manuscript.

Change in the text 6) Please see lines 335-340 in the limitations section of the revised manuscript.