

Peer review file

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Reviewer A

Comment 1: Introduction: - Lines 3-4 are off-topic, please remove.

Reply: Thank you very much for your advice. We changed the order of topics in the introduction and reference numbers, because discussing torsion is not the main topic of our manuscript.

Changes in the text: Atelectasis of the middle lobe after right upper lobectomy is often seen, and the rates are higher than for other lobes [1, 2]. Atelectasis can result in pneumonia or respiratory dysfunction. Some studies have reported that chronic obstructive pulmonary disease or a short distance from the carina to the middle lobe orifice could be risk factors for middle lobe atelectasis [2, 3]. However, the risk factors are uncertain, and the condition cannot be prevented. Torsion of the middle lobe is rarely seen after right upper lobectomy, but it is a serious complication [4, 5]. Torsion of the lobe occurs in 0.089–0.3% of patients following lobectomy [6, 7]. (Page 3, Lines 3-9)

Reference numbers were changed (Page 10, Lines 2-14)

Comment 2: Why was bronchoscopy not performed for sputum suction prior to mini-tracheostomy?

Reply: Thank you very much for your comment. Staff enable to perform bronchoscopy is not always stationed. Therefore, We routinely perform mini-tracheostomy for patients who have constant sputum and are unable to excrete sputum well.

Changes in the text: None.

Comment 3: Conclusion: - Based on a retrospective study, investigators are limited to identification of risk factors, which MAY BE ASSOCIATED with... You require a

prospective study to confirm that. Thus, they conclusion should be changed.

Reply: Thank you for your helpful recommendation. We changed and added sentences like below to the limitation section and the conclusion section.

Changes in the text:

prospective (Page 8, Line 18)

Further prospective studies of this method for predicting the middle lobe atelectasis after right upper lobectomy should be conducted. (Page 9, Line 1-2)

Comment 4: General: - Linguistic editing should be double-checked.

Reply: Thank you for your kind suggestion. Linguistic editing have finished to be double-checked.

Reviewer B

Comment 1: Thank you to better explain the criteria diagnosis of middle lobe atelectasis (chest X Ray? CT scan?)

Reply: Thank you for pointing it out. We have mentioned it in the Methods section. (Page 4, Lines 21-23)

Changes in the text: None.

Comment 2. what is exactly a mini-tracheostomy?

Reply: It is a cricothyroidotomy. We routinely use a cricoidthyroidotomy kit (Mini-Trach II Seldinger Kit TM, Smiths Medical ASD, Inc. , Minneapolis, US).

Changes in the text: mini-tracheostomy (Mini-Trach II Seldinger Kit TM, Smiths Medical ASD, Inc., Minneapolis, US) was performed. (Page 4, Lines 19-20)

Comment 3. how many patients had pulmonary symptoms? infection? and their treatment (antibiotics?)

Reply: 17 cases (5%) had pneumonia and all patients received antibiotics. However, we excluded pneumonia from our investigation, because pneumonia with atelectasis was supposed to be much more than pneumonia without atelectasis.

Changes in the text: None.

Comment 4. The grade of the fissure was assessed preoperatively by CT scan or preoperatively? because the grade of the fissure is a risk factor for middle lobe atelectasis, I think that a complete description and an explanation of the criteria are required.

Reply: Thank you very much for your important comments. The pulmonary fissure was classified intraoperatively. We added to the text.

Changes in the text: intraoperatively (Page 5, Line 1)

Comment 5. For the analysis of the postoperative diameter of the bronchus, I think that it would be better to measure the difference between the pre and the post op diameter and to compare these measures.

Reply: Thank you for the suggestion. In univariate analysis, the difference between the pre and the postoperative diameter of the middle lobe bronchus also was significant (<0.001). However, this acts as a covariate of pre and postoperative diameter. Therefore, we kept the contents.

Changes in the text: None.

Comment 6. The difference of bronchial diameter between the two groups are really very small (0.3 mm) and no cutoff exists. Then the clinical application is limited. You explained the improvement of the atelectasis with the disappearance of the postoperative bronchial edema. However, how did you diagnose bronchial edema? I think that your explanation is not so clear. Is there bronchial edema on postoperative

CT scan? Furthermore, have the preop pulmonary lung function and pulmonary volumetry been evaluated for risk factors?

Reply: Thank you very much for your excellent suggestion. It is assumed that postoperative small diameter of the middle lobe bronchus is related to bronchial edema, however we didn't performed bronchoscopy postoperatively. We consider that further research will probably be necessary in the future. As preoperative pulmonary function, COPD was diagnosed using the ratio of forced expiratory volume in one second to forced vital capacity <70% on spirometry after bronchodilator administration. In our results, COPD was insignificant as a risk factor. Therefore, pulmonary volumetry was not assessed preoperatively.

Changes in the text: Chronic obstructive pulmonary disease was diagnosed using the ratio of forced expiratory volume in one second to forced vital capacity <70% on spirometry after bronchodilator administration. (Page 4, Lines 29-30)

Comment 7: Finally, what do you recommend to avoid middle lobe atelectasis?

Reply: Thank you for your comment. We consider that stapling on the upper lobe side may prevent atelectasis if it is permitted oncologically.

Changes in the text: None.

Reviewer C

Comment 1: The CONSORT diagram (Figure 1) is incomplete as it should show the study and control groups.

Reply: Thank you very much for your helpful advice. We changed Figure1.

Changes in the text: Please refer to Figure1.

Comment 2: A major limitation of this study is the lack of bronchoscopy in assessing

the middle lobe bronchus directly. Although the authors detail physiotherapy and insertion of mini tracheostomy as therapeutic maneuvers - there is no assessment of airway edema, retained secretions or sampling to determine the present of infection.

I would suggest the authors also discuss the rate of atelectasis the middle lobe after lower lobectomy as a comparison.

Reply: Thank you very much for your comment. We have rarely experienced the middle lobe atelectasis after lower lobectomy. It is assumed the reason is because the rate of incomplete fissure between the middle lobe and the lower lobe is lower than it between the upper lobe and the middle lobe or middle lobe bronchus is tend to be straight line to the intermediate bronchus after lower lobectomy.

Changes in the text: We have rarely experienced the middle lobe atelectasis after lower lobectomy. It is assumed the reason is because the rate of incomplete fissure between the middle lobe and the lower lobe is lower than it between the upper lobe and the middle lobe or middle lobe bronchus is tend to be straight line to the intermediate bronchus after lower lobectomy. (Page7, Lines 10-13)

Comment 3: It is unclear what the authors mean in separating "fissureless technique" and "stapling of the fissure" in the manuscript and in Table 1. I suspect the authors intend to highlight the concept of incomplete fissures - but this is not clearly states in the manuscript. I feel that this, rather the the stapling technique may be driving the differences in the rate of atelectasis seen.

Reply: Thank you for your comment. "Fissureless technique" is the way which the dense interlobar fissure is finally divided by staplers. It can decrease postoperative postoperative prolonged air leakage. We had predicted that "fissureless technique" for incomplete fissure was concerned with atelectasis. Our results indicated that although the cases of atelectasis using "fissureless technique" were tend to be higher than non-atelectasis group, the differences between them was insignificant. Possibly, "Fssureless technique" might have been tend to cause stapling on the upper lobe side because the fissure is stapled finally. Considering our results, stapling on the upper lobe side may prevent atelectasis if it is permitted oncologically.

Changes in the text: Fissureless technique is the way which the dense interlobar fissure is finally divided by staplers. It can decrease postoperative prolonged air leakage. We had predicted that fissureless technique was concerned with atelectasis. However, our results indicated that although the cases of atelectasis using fissureless technique were tend to be higher than non-atelectasis group, the differences between them was insignificant. Considering our results, fssureless technique might have been tend to cause stapling on the upper lobe side because the fissure is stapled finally. (Page 7, Lines 14-19)

Reviewer D

Comment 1: Change the title to a more specific statement, eg preoperative bronchial diameter is a risk factor for atelectasis; etc. The current title sounds more like a review paper.

Reply: Thank you for your comment. We added a few words to the title.

Changes in the text: Risk factors for atelectasis of the middle lobe after right upper lobectomy: Preoperative bronchial diameter and stapling of the fissure (Page 1, Lines 3-4)

Comment 2: Change the order of topics in the introduction: currently you begin by discussing torsion, which is not the main topic of your manuscript; this is slightly confusing. I would suggest making your intended statement clearer.

Reply: Thank you for your comment. We agree with you and changed our introduction partly and reference numbers.

Changes in the text: Atelectasis of the middle lobe after right upper lobectomy is often seen, and the rates are higher than for other lobes [1, 2]. Atelectasis can result in pneumonia or respiratory dysfunction. Some studies have reported that chronic obstructive pulmonary disease or a short distance from the carina to the middle lobe

orifice could be risk factors for middle lobe atelectasis [2, 3]. However, the risk factors are uncertain, and the condition cannot be prevented. Torsion of the middle lobe is rarely seen after right upper lobectomy, but it is a serious complication [4, 5]. Torsion of the lobe occurs in 0.089–0.3% of patients following lobectomy [6, 7]. (Page 3, Lines 3-9)

Reference numbers were changed. (Page 10, Lines 2-14)

Comment 3: How many surgeons performed the lobectomies in your unit? Are these senior surgeons? Were any cases training cases? This would be important information as it may influence operative time and therefore change the operative risk.

Reply: Thank you for pointing it out. All cases were performed by 5 surgeons trained for 7 years or longer.

Changes in the text: All cases were performed by 5 surgeons trained for 7 years or longer. (Page 3, Line 25)

Comment 4: Many chest x-rays are performed in your unit (days 1, 2, 4, 7) - are these all routine x-rays?

Reply: Yes, they are.

Changes in the text: None.

Comment 5: What were the reasons for conversion to open thoracotomy; were this planned or emergency conversion?

Reply: 17 cases were conversion to open thoracotomy due to strong adhesions (15 cases) and bleeding (2 cases).

Changes in the text: 17 cases were conversion to open thoracotomy due to strong adhesions (15 cases) and bleeding (2 cases). (Page5, Lines 21-22)

Comment 6: Do you have data on length of stay? Do your patients transfer to a HDU or normal ward setting after surgery?

Reply: Thank you for pointing it out. Although our most patients can discharge within five days, length of hospital stay is longer than the other countries due to Japanese medical insurance and hospital management. Therefore, We don't describe data on length of stay because it is not helpful for you. We added chest drainage duration to table 1. Our patients stay in the high care unit for operative patients to postoperative day 1.

Changes in the text: We added chest drainage duration to table 1. (Page 12 and Table 1 file)

Reviewer E

Comment 1: The word count of the article is not stated.

Reply: Thank you very much for pointing it out. We added the word count.

Changes in the text: 3879 (Page1, Line 28)

Comment 2: it is not clear if all patients in the cohort had a CT scan during hospitalization, could you indicate the % of patients who had one?

Reply: 13 of 342 cases (3.8%) had a CT scan during hospitalization.

Changes in the text: None.

Comment 3: Your team have a higher rate of atelectasis than the others, do you think this is related to a better diagnosis (systematic CT scan?) compared to the other studies?

Reply: No, we don't. We think the reason is because our atelectasis was diagnosed regardless of the asymptomatic atelectasis and performing bronchoscopy (Page 6, Lines

20-25).

Changes in the text: None.

Comment 4: Finally, if these atelectasis have no clinical repercussion, one can wonder if it is necessary to systematically search for them.

Reply: Thank you for pointing it out. We often experience the atelectasis of middle lobe atelectasis in daily clinical practice, although It may be a trivial matter. We should always question everything.

Changes in the text: None.

Comment 5: Finally, there is also a (very slight) difference related to the duration of the operation (statistically significant), but you do not mention it in the discussion or in the conclusions.

Reply: Thank you for your comment. P value is barely <0.05 , however we considered that the OR is just about 1 and ignorable clinically.

Changes in the text: However, It is assumed that the odds ratio is just about 1 and ignorable clinically. (Page 7, Lines 22-23)

Comment 6: Furthermore, the number of patients operated on in "fisureless" mode is low in both groups. The difference in terms of % is important (9.2 vs 16.9%), isn't the absence of difference rather related to a lack of power, what do you think? Indeed, in our experience, the "fisureless" approach has simpler consequences, especially in terms of prolonged air leakage.

Reply: Thank you for your comment. "Fissureless technique" is the way which the dense interlobar fissure is finally divided by staplers. It can decrease postoperative postoperative prolonged air leakage. We had predicted that "fissureless technique" was concerned with atelectasis. Our results indicated that although the cases of atelectasis

using “fissureless technique” were tend to be higher than non-atelectasis group, the differences between them was insignificant. Considering our results, stapling on the upper lobe side may prevent atelectasis if it is permitted oncologically. On the other hands, “Fssureless technique” might have been tend to cause stapling on the upper lobe side because the fissure is stapled finally.

Changes in the text: Fissureless technique is the way which the dense interlobar fissure is finally divided by staplers. It can decrease postoperative postoperative prolonged air leakage. We had predicted that fissureless technique was concerned with atelectasis. However, our results indicated that although the cases of atelectasis using fissureless technique were tend to be higher than non-atelectasis group, the differences between them was insignificant. Considering our results, fssureless technique might have been tend to cause stapling on the upper lobe side because the fissure is stapled finally. (Page 7, Lines 14-19)

Comment 7: Why didn't you compare VATS vs thoracotomy in your study, there are no figures on these data in your table.

Reply: Thank you for your comment. We have already described comparing VATS vs thoracotomy in operative procedure of Table1.

Changes in the text: None.

Comment 8: What do you mean by "mini tracheostomy" in the postoperative outcome?

Reply: Although “mini tracheostomy” was performed for limited number of cases, We consider that it may have prevented severe pneumonia.

Changes in the text: None.