Peer Review File

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Reviewer A

Comment: *It is an interesting case, infrequent of the compilations of segmentectomy, it is very well documented, the anatomical variants are apparently much greater at the segmental level than at the lobar level, it would be interesting to talk about surgical planning as a tool to sometimes avoid this type of complications, for example reconstructions and 3D models. In the future, this type of complications will be documented more frequently, since there is a global trend to perform a greater number of segmentectomy and this would be the initial step to have a greater degree of evidence of what could come in the future.*

Reply: Thank you very much for your helpful comment on our manuscript. As you have pointed out, it will be important in the future to confirm the detailed vascular runout by 3DCT before surgery (please see **page 6, line 143**). The following references you provided have also been added (please see **page 6, line 144; page 10, lines 199-207**).

7. Shimizu K, Nagashima T, Ohtaki Y, Obayashi K, Nakazawa S, Kamiyoshihara M, et al. Analysis of the variation pattern in right upper pulmonary veins and establishment of simplified vein models for anatomical segmentectomy. Gen Thorac Cardiovasc Surg. 2016;64:604–11.

8. Maki R, Miyajima M, Ogura K, Tada M, Takahashi Y, Adachi H, et al. Anatomy of the left subsuperior segment for segmentectomy. Surg Today. 2022;52:1054–62.

9. Zhang M, Liu D, Wu W, Zhang H, Mao N. Preoperative 3D-CT bronchography and angiography facilitates single-direction uniportal thoracoscopic anatomic lobectomy. Ann Transl Med. 2019;7:526–526.

Reviewer B

Comment: *There is no innovative description in this case report.*

Reply: As more segmentectomies are performed in the future, these complications are expected to increase. We hope that this case study will help guide our treatment strategy.

Reviewer C

Comment: *The authors reported a case of postoperative residual lung congestion after left upper trisegmentectomy. They stated that they noticed anatomic abnormalities postoperatively that may have caused the congestion. We need to plan segmentectomy with a preoperative 3D-CT to fully identify the vascular and bronchial branching. In this case, it was probably important to preserve the vessels in the S3 region by performing an S1+2 segmentectomy.*

Reply: Thank you very much for your helpful comments on the manuscript. It seems necessary to understand the running of the vessels by preoperative 3DCT. We modified the description (**page 6, line 143**). The reason for performing trisegmentectomy instead of S1+2 segmentectomy is to ensure

sufficient field of view for lymph node dissection. We added the sentence as follows; **"We decided to perform LUTS including S3 in order to dissect the hilar lymph node." (page 4, lines 76**)

Reviewer D

Comment 1: *I suggest you to describe the details of antibiotic therapy (duration? types?) and any adjuncts such as preventive anticoagulant/antithrombolytics?*

Reply 1: Thank you for pointing this out. Antibiotics were used until the 27th postoperative day, as we have already described in the text **(page 5, lines 98-99**). V4+5 had decreased blood flow but was not obstructed, so anticoagulants/antithrombotics were not used in this case.

Comment 2*: The 3D reconstruction of chest CT in your follow-up scan is preferred to demonstrate the post-op condition of thin V4+5.*

Reply 2: The 3D reconstruction was not available. Our apologies.

Comment 3: *In Figure 1, the order of figure legends should be reorganized (a->b->c->d).*

Reply 3: Thank you for your suggestion. We have changed the legend of Figure 1 **(**please see **page 11, lines 218-221**).

Comment 4: *I suggest the title could be revised in a more concise sentence (e.g. Conservative treatment for lingular congestion after left upper trisegmentectomy of early-stage lung cancer)*

Reply 4: Thank you for your suggestion. In accordance with your suggestion, we have changed the title as follows.

"Conservative treatment for residual lung congestion after left upper trisegmentectomy: a case report" (page 1, lines 1-2)

Reviewer E

Comment 1: *I think main cause of this complication was residual part of S3, rather than congestion of the lingulla. If you preserved V4+V5 surely, it is thought there may not be major problem for the congestion.*

Reply 1: We consider that V4+5 could have been preserved, but the structural changes in the lungs would have caused flexion of the same vessels and decreased reflux. Also, I think that two complications occurred at the same time: residual S3 congestion and reduced flow of V4+5.

Comment 2: *Why did you indicate tri-segmentectomy, not bi-segmentectomy nor wedge resection for the left lung cancer? It would be better that your total surgical plan (for the bilateral lung cancer) is described in this report.*

Reply 2: The F was higher for the left lesion and the plan was to precede surgery on the left lesion and then operate on the right lesion in two phases. Surgery for the right lesion was performed 3 months after surgery. This has already been mentioned in the text **(page 3-4, lines 73-76**). The reason for performing trisegmentectomy instead of bisegmentectomy is to ensure a sufficient field of view for lymph node dissection. We added the sentence as follows; **"We decided to perform LUTS including S3 in order to dissect the hilar lymph node." (page 4, lines 76**)

Comment 3: *Did you utilize ICG fluorescence method? If there are any findings that you noticed, please describe them additionally.*

Reply 3: Thank you for pointing this out. It is very important to set intersegmental identification. We did not use ICG and determined the incision line by checking the containing collapse line. We consider it more likely that the ICG would have allowed us to set the incision line more precisely and cut out the S3 area without leaving any S3 area. Therefore, it is important to use ICG to prevent such complications. We added the sentence of discussion as follows; **"With regard to the surgical technique, it is likely that the use of ICG would have allowed for a more precise incision line without leaving an S3 area. It is important to use ICG to identify the intersegmental plane to prevent isolated segment in segmentectomies." (page 6-7, lines 144-147**)

We have also added the following references (please see **page 7, line 171; page 10, lines 208-213**).

10. Sun Y, Zhang Q, Wang Z, Shao F, Yang R. Is the near-infrared fluorescence imaging with intravenous indocyanine green method for identifying the intersegmental plane concordant with the modified inflation-deflation method in lung segmentectomy? Thorac Cancer. 2019;10:2013–21.

11. Yotsukura M, Okubo Y, Yoshida Y, Nakagawa K, Watanabe S ichi. Indocyanine green imaging for pulmonary segmentectomy. JTCVS Tech. 2021;6:151–8.

Reviewer F

Comment 1: *This is a very interesting paper. There have been several reports (both published and anecdotal) about pulmonary complications following left apical trisegmentectomy, and I think the authors' experience will be a welcome contribution to this discussion.*

Given the unusual nature of this type of complication, I think that it would be valuable to add a detailed account of the surgical technique, as well as a detailed description of bronchial and vascular anatomy on preoperative imaging (including 3D reconstructions, if available). The authors do provide an image of B3, but I think that is not sufficient. This is also very relevant to the fact that the authors describe an absence of intraoperative anatomical variations or anomalies; what did V4+5 look like? Were there any potential intraoperative concerns that may have justified completing a lobectomy?

Reply 1: There was no obvious preoperative abnormality in the vascular run. This is noted in the text. V4+5 was confirmed intraoperatively and there were no obvious intraoperative concerns, but ICG was not used to determine between areas.

Comment 2: *How was the intersegmental plane defined? This is particularly relevant; if insufflation was used to identify the demarcation plane, then the anomalous B3 would lead to an erroneous identification of the plane. This would then be a limitation of this technique.*

If ICG was used, a description of findings would be useful. If venous drainage was impaired in the lingula and the isolated B3 segment, perhaps a delayed washout of ICG in this area may have been seen? If so, then I would suggest an argument could be made that ICG can provide not only anatomic but functional information that there may be an issue with the remaining segment. This would be a very important takeaway and an argument in favour of using ICG.

Reply 2: Theprecise incision line was set up using inflation-deflation line in this case, which may have caused the S3 region to remain. Therefore, the use of ICG is important to establish an accurate line of dissection. We have added that information to the text (please see **page 4, lines 79-80; page 6-7, lines 144-147**).

Comment 3: *The concept of "isolated segment" is an interesting one and one that is not readily found in the literature. I think this paper provides an opportunity to clearly explain the concept. My understanding is that a portion of the bronchial circulation drains into branches of the pulmonary veins. If a segmental bronchus is preserved (along with the bronchial arterial inflow) while the pulmonary venous drainage is divided, then in cases where the bronchial venous system is insufficient the corresponding parenchyma may become congested and necrose.*

The paper discusses two separate issues: lingular venous drainage, and impaired venous drainage of the isolated B3 segment. It would be helpful if the authors clearly separated these two issues in the text, as I feel this is not currently the case and may lead to some confusion.

Reply 3: I agree with your thoughts on A. As you pointed out, there were two complications occurring simultaneously in this case, and I have changed the discussion to clarify **(page 5-6, lines 116-123**).

Comment 4: *Lastly, it is common (although not universal) practice to fix the middle lobe after right upper lobectomy to prevent torsion. Is this something that should be considered after left apical trisgementectomy? This paper is a good opportunity to raise the question.*

Reply 4: Thank you for the discussion. We don't think fixation is common, but such an approach may need to be considered in terms of preventing torsion and positional changes.

Comment 5: *The word "reflux" is used in several cases to denote venous drainage. Please rephrase for clarity.*

Reply 5: The text has been changed from reflux to flow as appropriate **(page 2, line 37; page 4, line 91; page 4, line 96; page 5, line 114; page 6, line 124**).

Comment 6: *The term "dissected" is used for "divided" in several cases. Please rephrase for clarity.*

Reply 6: Thank you for your pointing. As you indicated, dissected was changed to divided (please see **page 4, line 78**).

Comment 7: *On line 114, "B3b" is used whereas "B3" is used everywhere else. Please explain or be consistent.*

Reply 7: Thank you for your pointing. As you indicated, B3b was changed to B3 (please see **page 5, line 117**).