

Peer Review File

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Reviewer A

The present work aims to evaluate the accuracy of thoracic radiologists in assessing the fissuration based on CT data compared with direct anatomical evaluation interoperatively. As correctly stated by the authors, correct assessment of the fissurization is important with respect to bronchoscopic lung volume reduction.

The present prospective work is correctly performed in terms of methodology and design but has certain shortcomings. The presentation of the results themselves is clear and concise.

Thank you for this careful review. We appreciated the comments.

The greatest weakness of the work is the reference to the MIP technique. Here, explicit reference is made to the assessment by means of MIP. In the abstract as well as in the methods, only or hardly any reference is made to the fact that the radiologists had MIP images available during the assessment in order to obtain additional information if necessary. There is no actual assessment of MIP compared, for example, with MPR. In this respect, the title as well as parts of the discussion are misleading.

Thank you for this comment. We have added sentences in the “Introduction” about the MIP technique and its diagnostic utility, in order to clarify the importance of the MIP in this field and in this research.

Changes in the text:

- Lines 117-124

In addition, the following points stand out:

In the method section, the section "fissure gradation" and "intraoperative assessment" contradict each other. It is unclear why it needs both sections. Furthermore, tasks of radiologists are mixed with those of surgeons. This needs an explanation.

Thank you for this comment. We have performed several changes in the “Methods” in order to improve and clarify the methodological explanation. In the section “fissure gradation”, we explain how the fissures were evaluated and categorized, by both surgeons and radiologists. In the following sections, we aimed to describe the principles for the surgical and radiological evaluation. The surgeons and radiologists performed their evaluation blinded and independently. There was no report of the fissure integrity elaborated by the radiologists accessible to the surgeons.

Changes in the text:

- Removed sentence in the lines 150-151.
- The sentences in the lines 193-195 were moved to the lines 165-167.
- The sentences in the lines 170-176 were moved to the lines 210-216.
- The sentences in the lines 176-179 were moved and distributed in the lines 201-205.
- The sentences in the lines 195-198 were moved to the lines 232-234.

A major deficiency is the lack of information on the distribution and severity of emphysema on the CT images. This greatly influences the radiologists' assessment of fissuration. This could explain the relatively weak kappa value.

Thank you for this comment and we agree with that. Many patients with severe emphysema are not surgical candidates, except for LVRS or lung transplant, and therefore the recruitment of those patients for such a comparative study having the surgical evaluation as the reference pattern is very difficult. We described the population characteristics in table 1, and 45% of the patients had emphysema according to the GOLD criteria. However, we did not correlate the distribution and the severity of the emphysema on the CT images and their potential impact on the agreement between radiologists and surgeons. It is well known that the more severe the emphysema, the more complex the fissure integrity evaluation and potentially more susceptible to disagreement the evaluation amongst radiologists.

In the section image evaluation it is mentioned that MIPs were made. However, there is no information about the orientation in which this was done.

Thank you for this comment. MIP was routinely performed with thickness of 8 mm in sagittal and coronal planes. This description is detailed in "Methods" section, in the "Imaging Evaluation" topic. We have performed a minor change in the sentence below mentioned.

Changes in the text:

- Lines 242-243.

In the discussion, the MIP is again strongly discussed. However, this was not documented in the results section at hand or the benefit of the MIP is not presented/evaluated at all. In this respect, the conclusion is not correct.

Thank you for this comment.

In this research, we aimed to evaluate the agreement of the radiologist assessment of the fissure integrity reading MDCT scans and using MIP technique routinely. We did not perform a comparative study of radiological performance by using MIP versus not using MIP in this evaluation. In many studies in this field, the MIP technique was not routinely used or it was not reported. We hypothesize that adding this algorithm to the fissure evaluation by dedicated thoracic radiologist could be useful in achieving a higher accuracy compared to the direct/surgical evaluation (the standard reference in

this study). With the goal of having this topic clearer for the reader, we have added a sentence in the “Discussion” stating that no direct comparison evaluating the MIP algorithm was performed.

We have performed changes in the “Introduction” and in the “Discussion” sections in order to present the benefits of adding the MIP technique to the MDCT scan evaluation.

Changes in the text:

- Lines 117-124
- Lines 333-352.

In summary: The present paper describes the accuracy of the assessment of fissuring by radiologists compared to the surgical gold standard. The work has certain methodological shortcomings.

Thank you for your dedicated review of this paper. We acknowledge the limitations of this research. We expect that the changes made in this manuscript following the comments and suggestions above might improve this paper and make it more attractive to the reader.

Reviewer B

An interesting analysis comparing the effectiveness of radiologic evaluation in comparison to direct anatomic inspection. Several small thoughts:

1. Are the indications the same for BLVR compared to LVRS? Might be worth briefly discussing those criteria in intro as they are quite strict for surgery.

Thank you for this comment and suggestion.

We have performed changes in the “Introduction” section to contextualize the rationale and indications of the BLVR and LVRS, procedures for which an accurate MDCT scan evaluation has paramount importance and impacts the decision-making process.

Changes in the text:

- Lines 81-85
- Lines 91-93

2. Would do a general read through for grammar

Thank you for this comment and suggestion. We took this opportunity to review and improve grammatical aspects of the paper. In this regard, we have performed several changes in the writing throughout the manuscript.

3. In the discussion, the second paragraph might better summarize other groups findings instead of listing each study's results individually. The discussion of MIP can be condensed as it takes away from your point that it may have aided your results.

Thank you for this comment and this suggestion. We rephrased the second paragraph,

summarizing the key results of the reported studies, as suggested. We also performed changes in the third paragraph of the “Discussion” about the MIP technique, aiming to be more objective the discussed aspect.

Changes in the text:

- Lines 319-324.
- Removed lines 324-331.
- Lines 332-352.

4. On line 295, how do you define 80-85% accuracy as significant for clinical decisions?

Thank you for this question. We rephrased this sentence and replaced the word “significant” by “important”.

Changes in the text:

- Line 360

5. You mention TLVR >350mL frequently in discussion but is this a standardized goal for BLVR? I didn't see mention in intro or methods.

Thank you for this question and this is a very important one. TLVR >350mL is considered to be clinically relevant and it has been used as a standard endpoint, among others, to categorize response after BLVR in randomized clinical trials, as the LIBERATE¹ and the STELVIO² trials, and other studies³ (references below). We have added a sentence in the “Introduction” to clarify the utility of this parameter for the reader.

Changes in the text:

- Lines 109-112
- Lines 319-320

References:

1. Criner GJ, Sue R, Wright S, Dransfield M, Rivas-Perez H, Wiese T, et al. A Multicenter Randomized Controlled Trial of Zephyr Endobronchial Valve Treatment in Heterogeneous Emphysema (LIBERATE). Am J Respir Crit Care Med. 2018 Nov;198(9):1151–64.
2. Klooster K, ten Hacken NHT, Hartman JE, Kerstjens HAM, van Rikxoort EM, Slebos D-J. Endobronchial Valves for Emphysema without Interlobar Collateral Ventilation. N Engl J Med. 2015 Dec 10;373(24):2325–35
3. Herth FJF, Eberhardt R, Gompelmann D, Ficker JH, Wagner M, Ek L, et al. Radiological and clinical outcomes of using Chartis™ to plan endobronchial valve treatment. Eur Respir J. 2013;41(2):302–8.