

Peer Review File

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Reviewer A

This paper examines specificity and sensitivity of magnetic resonance imaging in routine diagnosis of pulmonary lesions compared to computed tomography. The authors address an interesting topic that is becoming increasingly important. In particular, the new sequences, some of which are described here, open up new possibilities for MR imaging of the lung. The work presented here shows positive results regarding the detection of round foci by MRI. The work shows only single minor deficiencies. It is comprehensible and adequately structured.

The following points should be mentioned:

Comment 1: The exclusion of patients who have problems with breath holding creates a bias in which a nevertheless important population could not be examined by MR. Especially patients with COPD would be excluded, but they have an increased risk for tumors.

Reply 1: Thanks for the reviewer's rational comment. Because patients who have problems with breath holding didn't advised to get thoracic MRI examination in the routine clinical practice. Some sequences (such as T1WI-VIBE) are sensitive to the respiratory motion. Although the sequences (such as T1WI-starVIBE, T2WI-TSE-fBLADE, T2WI-SPACE) are insensitive the cardiac/respiratory motion. I believe, as the development of MRI, the patients who have problems with breath holding can achieve better image quality in the future.

Comment 2: The following weaknesses arise in the analysis, in which only examinations with lesions were included in the analysis. Due to the lack of so-called negative cases, the readers were fixated on the fact that they had to find a round focus for sure. In this respect, the high sensitivity is correct, but the specificity cannot be adequately assessed.

Reply 2: Thanks for the reviewer's rational comment. CT remains a primary first-line imaging modality for characterizing pulmonary disease to date. So we studied the nodules which can be detected by CT (WPS-type .doc, manuscript-revision; line 154-155/ page 8) and the "sensitivity" and "specificity" was defined in this research (WPS-type .doc, manuscript-revision; line 211-213/ page 11).

Comment 3: The additional assessment of image quality is rather difficult due to the already performed patient selection, as it can hardly be assumed that patients with low scores can be included.

Reply 3: Thanks for the reviewer's rational comment. In our study, patients with severely impaired pulmonary function and lower breath-hold capability with larger

motion artifact (WPS-type .doc, manuscript-revision; line 162-165/ page 9) were excluded. Those patients also weren't advised to get MRI examination in the routine clinical study.

Comment 4: The first section of the results part contains a lot of figures, which are partly reproduced in the tables. It is recommended to make general statements and to refer to the figures in the tables, because this section is hardly readable.

Reply 4: Thanks for the reviewer's rational comment. We accepted the reviewer's suggestion and simplify the first section of the results part.

Changes in the text: Marked in revised paper (WPS-type .doc, manuscript-revision; line 274/ page 14).

Comment 5: In the discussion, the results are partly repeated. However, one fact that is not addressed enough is the problem of artifacts in patients with only limited breath-holding capabilities.

Reply 5: Thanks for the reviewer's rational comment. In routine clinical practice, patients who have problems with breath holding didn't advised to get thoracic MRI examination because of the motions artifacts. As the development of the MRI techniques, the problem of artifacts in patients with limited breath-holding capabilities can be resolved.

In summary, this is a very interesting paper that illustrates the increasing importance of MRI in the evaluation of pulmonary nodules.

Reviewer B

General comments:

The authors present a very interesting manuscript about a comparison study of magnetic resonance imaging (MRI) of the lung, including four different MRI sequences, with computed tomography (CT) of the chest. The topic is actual, and the results are interesting. A minor revision would further increase the comprehension and the relevance of the manuscript.

Specific comments:

Comment 1: Title: O.k.

Comment 2: Keywords: Please use "Pulmonary nodule" instead of "lung nodule".

Reply: We accepted the reviewer's suggestion and used "pulmonary nodule" instead of "lung nodule".

Changes in the text: Marked in revised paper (WPS-type .doc, manuscript-revision; line 100/ page 6).

Comment 3: Abstract:

The age of the patients should be included.

Reply: Due to the limitation of the words counts, we didn't include the age of patients in the abstract, which was depicted in the "Materials and methods: Patients" (WPS-type .doc, manuscript-revision; line 165-166/ page 9).

Comment 4: Introduction:

The chapter introduces very well in the topic of the manuscript.

Comment 5: Materials and Methods:

- Patients:

The underlying diseases, which lead to clinical indications of chest CT and lung MRI, should be included.

Reply: Thanks for the reviewer's suggestion. Patients with pulmonary nodules or masses detected by CT were advised to undergo dedicated thoracic MRI (WPS-type .doc, manuscript-revision; line 154-155/ page 8). Some of those nodules may be detected occasionally during the routine examination.

Comment 6: CT and MRI:

Were the CT and MRI examinations performed by using contrast media? Please add the standard deviation of the average radiation dose of the CT examinations. The description of the technical parameters of the MRI sequences can be shortened, as they are all listed in the text.

Reply: The CT and MRI examinations were performed without using contrast media. We accepted the reviewer's suggestions and added the standard deviation of the average radiation dose of the CT examinations, as well as simplified the description of the technical parameters of the MRI sequences.

Changes in the text: Marked in revised paper (WPS-type .doc, manuscript-revision; line 177/ page 9; line 190-192/ page 10).

Comment 7: Results:

This chapter can be shortened as the information is in part presented in tables.

Reply: Thanks for the reviewer's rational comment. We accepted the reviewer's suggestion and simplified the results part.

Changes in the text: Marked in revised paper (WPS-type .doc, manuscript-revision; line 274/ page 14, line 288/ page 15).

Comment 8: Discussion and Conclusions:

The clinical relevance could be more discussed and emphasized. Please add the following manuscript by discussing the UTE sequence:

Renz DM, Herrmann KH, Kraemer M, Boettcher J, Waginger M, Krueger PC, Pfeil A, Streitparth F, Kentouche K, Gruhn B, Mainz JG, Stenzel M, Teichgraeber UK, Reichenbach JR, Mentzel HJ. Ultrashort echo time MRI of the lung in children and adolescents: comparison with non-enhanced computed tomography and standard post-contrast T1w MRI sequences. *Eur Radiol.* 2022 Mar;32(3):1833-1842. doi:

10.1007/s00330-021-08236-7.

Reply: Thanks for the reviewer's suggestion. We accepted the reviewer's suggestion and added the following manuscript by discussing the UTE sequence.

Changes in the text: Marked in revised paper (WPS-type .doc, manuscript-revision; line 321/ page 16, line 477-480/ page 23).

Comment 9: Tables and Figures:

Some of the presented cases can be placed in the supplementary material.

Reply: Thanks for the reviewer's suggestion. According to the editorial requirement, Table-4 can be placed in the supplementary material.