Reviewer's report

Title: Diffusion Tensor Changes Correlate with Lesion Volume in Right Cerebral Hemisphere Infarctions

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Reviewer: Hans-Jörg Wittsack

Reviewer's report:

The manuscript deals with diffusion tensor imaging (DTI) in patients with right hemispheric stroke. A comparison between DTI in chronic phase of stroke and the lesion volume as well as the results of neurological tests is addressed. The manuscript is well designed and reasonable. However, there are some open questions and some possibilities to improve this work.

Major Compulsory Revisions:

1. In acute phase of stroke CT investigations were performed. Why? Stroke lesions are often not detectable in CT if symptom onset is less than 24h. Diffusion weighted MRI is more reliable in acute stroke imaging to determine the lesion volume. Further, in this context the lesion growth described in this work may be a result of the comparison of acute CT with MRI in chronic phase. Please discuss.

2. FA and MD values were measured in a set of standardized ROIs as well as within the lesion. Is there any dependency between localization of the lesion and regional changes of FA and/or MD? In particular: Are the regional alterations larger in regions of afferent fibers? A fiber tracking analysis should be possible based on the measured DTI. Maybe this could deliver additional information.

3. The mean diffusivity MD is very comparable to usually measured trace DWI. The temporal evolution of DWI signal with stroke lesion evolution is well studied in literature. What is the effect of temporal changes of MD in your data of patients in chronic phase?

4. Methods => DTI Analysis:

ROI size is 4 to 16 voxels. The ROI size of 4 voxels is very small. In the usually noisy DTI data a dislocation of a small voxel leads to large changes in the results. How did you handle with this problem and the objectivity?

Further, the anatomical quality of DTI (FA, MD) is poor. How were the ROIs placed reliably in the DTI maps (in particular the small ROIs)? Was an image overlay technique with high resolution anatomical data performed?

Minor Essential Revisions:

1. Methods => Imaging Sequence:

Please insert the imaging settings for CT, e.g. kV, mAs, ...
2. Methods => DTI Analysis:
Please insert the definitions of FA and MD (formulas, citations).

3. Results:
The initial CT was within 24h after symptom onset in all patients.? Please add the concrete time range and mean of the initial investigation.

4. Results: "Seven patients did not have any signs...."
Are this the same seven patients that did not show infarctions in MRI? Please clarify.

5. The found correlations are tabulated in table 3. A diagram of the most relevant findings may improve the readability.

6. Table 2:
Standard deviations are negative – please correct.

Discretionary Revisions:
1. MD and usually used DWI are very related. A detailed discussion of DWI findings in literature and MD of this work may improve the discussion.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests.