Reviewer’s report

Title: CASE REPORT: A GIANT ARACHNOID CYST MASKING ALZHEIMER’S DISEASE

Version: 4 Date: 22 Jul 2019

Reviewer: Kayako Matsuo

Reviewer's report:

I believe authors have considerably improved their manuscript since the first draft. Specifically, I appreciate the movie showing fMRI results on a slice by slice basis in the native space. I suggest authors to include this movie as a proper supplementary material to make rigorous researchers inspect the analysis. I believe that authors would agree with me, as they also encourage a rigorous use of neuroimaging modalities:

Our case report suggests the diagnostic value of rigorous neuroimaging modalities including DTI, fMRI and amyloid-PET imaging as well as ...(line 473-)

I would also like authors to address the following points.

Major points.

(1) Authors maintain that the patient's memory function in the brain would not be affected by the cyst because the fMRI showed a seemingly normal spatial registration for the motor function in the injured side as well as in the intact side. For example, they wrote:

The results of the functional imaging made tissue damage and thus a consecutive cognitive decline due to the giant arachnoid cyst less probably. (lines 327-328)

The logic sounds to be a stretch by two issues. First, the motor function could be normal when the memory function got injured. Second, a normal spatial registration of fMRI could not ensure an absence of a tissue damage.

I would suggest that authors should clearly make a concession regarding these issues.

(2) In relation with the point #1 above, authors wrote:
Since we did not aim at detecting the neuronal correlate of the cognitive decline but at understanding the structural and functional integrity despite the giant cyst, a cognitive task with fMRI would not have been helpful. (lines 427-429)

The logic sounds flawed because many fMRI studies have revealed double dissociation of functions; a memory task should have been helpful for this study. I would suspect that they just wanted to make excuses for their lack of cognitive tasks. There cannot be a perfect study in the world. Authors may want to rewrite this part in a modest and straightforward manner.

(3) Still in relation with the point #1 above, authors wrote:

fMRI revealed no map shift of the motor area for finger movements from the left to the right hemisphere (Figure 3) (lines 315-316)

This expression is awkward because the maps were distorted in reality because of the cyst. Authors may want to rewrite this sentence as explaining that the spatial registration by Freesurfer successfully mapped the functional areas quite similar to normal controls’. (Strictly speaking, authors should have statistically compared the patient’s map with normal controls’).

(4) I would like authors to rewrite the following sentences in Methods because they are unclear:

Movements of all 5 digits were performed before the movement of any digit was repeated. This was done to avoid timing effects on the BOLD signal. The order of digits within one of these repetitions was randomized. (lines 146 to 148)

Authors may want to put the sentence with D2, D2, D2… (lines 148-150) first.

Minor points.

(5) Line 139, "eypad" might be "keypad".

(6) Line 163, "coronar" might be "coronal".

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No
Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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I am able to assess the statistics

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