Reviewer’s report

Title: Deterioration of pre-existing hemiparesis due to injury of the ipsilateral anterior corticospinal tract

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Reviewer: Pierre Mégevand

Reviewer’s report:

In this case report, the authors describe a patient with a pre-existing stroke in the left internal carotid artery distribution and consequent right-sided hemiparesis who suffers a second ischemic stroke, this time in the right ventral paramedian pons. The pontine stroke is relatively small and causes mild to moderate left-sided hemiparesis, but in addition, the chronic right-sided hemiparesis worsens to the point that all voluntary movement is abolished on the right side. The authors propose that the right-sided anterior corticospinal tract (CST) had taken over motor control of the right side of the body, and that lesion of this tract is responsible for the deterioration of motor function on the right side. They show diffusion tensor tractography (DTT) images that indeed illustrate that the right anterior CST is interrupted at the level of the pontine stroke.

This article is well written and beautifully illustrates the large-scale reorganization of cerebral function that takes place after a brain insult. This reorganization is responsible for the alterations to the usual clinical-anatomical correlations (here, a right-sided injury aggravates right-sided hemiparesis). The authors are appropriately cautious in generalizing from their observation on a single case. This case will be of interest to a broad readership including general neurologists, students and residents in neurology, stroke neurologists, and rehabilitation medicine specialists.

1) Minor revisions

I think that the authors should describe how spasticity evolved on the right side after the right pontine stroke. Presumably the patient was spastic on the right side and had a right-sided extensor cutaneous plantar response from his previous left hemispheric stroke. It would be interesting to know whether spasticity, hyperreflexia and the extensor cutaneous plantar response were still present or whether they were abolished by the pontine stroke. This would contribute to our understanding of the pathophysiology of spasticity (or the pyramidal syndrome) and its anatomical pathways.

2) Discretionary revisions

- In the first paragraph of the Introduction section, I suggest removing the “On the other hand” that starts the last sentence of the paragraph.
- In the first paragraph of the Diffusion tensor tractography section, there is a
sentence which reads “The whole CSTs, which were determined by selection of fibers passing through two regions of interest (ROIs), were placed on the CST area of the pons and upper medulla on the color maps.” I suggest rephrasing it to something like “The whole CSTs were determined by selection of fibers passing through two regions of interest (ROIs), which were placed on the CST area of the pons and upper medulla on the color maps.”

**Level of interest:** An article of importance in its field

**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.