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Degeneration of Corticobulbar Tract by Perilesional Effect of Lacunar Infarction: A Case Report

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Introduction
Swallowing difficulties due to lacunar infarction in the periventricular white matter have been reported, however, the microstructural injury mechanism of lacunar infarction on the corticobulbar tract (CBT) has not been explored. We report a dysphagia case that the lacunar infarction did not directly involve the corticobulbar tract, but it revealed a focal degeneration of the CBT by perilesional edema of the lacunar infarction.

Case report
A 61-year-old male presented with anarthria following left periventricular white matter infarction. He had right basal ganglia hemorrhage leaving mild hemiplegia 15 years ago. Neurological examination revealed severe lingual paralysis. Diffusion tensor tractography showed the focal degeneration of left corticobulbar tract by perilesional edema, and a great part of right corticobulbar tract had already been injured by the old lesion. Fractional anisotropy (FA) analysis revealed the FA decrease of neural tissues surrounding the infarction, which attenuated with increasing distance. Perilesional edema may cause focal degeneration of neural tract, and FA analysis was valuable in evaluating the dispersing effect of perilesional edema.

Conclusion
It is difficult to determine whether the periventricular lacunar infarction involved the CBT using conventional neuroimaging modalities. Using diffusion tensor imaging and tractography, we could find the microstructural evidence of CBT degeneration, although lacunar infarction did not directly involve the CBT. Quantitative analysis of FA may help to evaluate the perilesional effect of the lacunar infarction.

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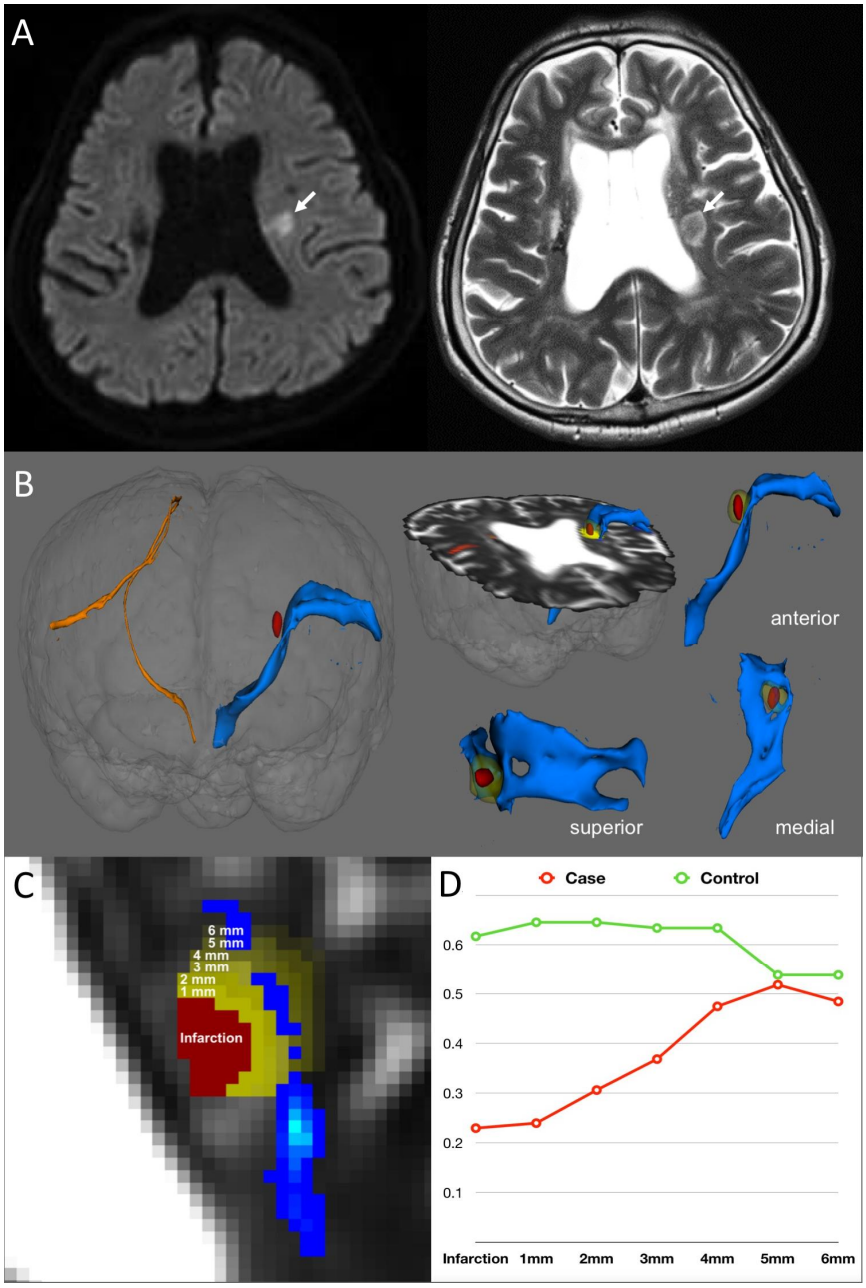

Figure. 1 (A) Left periventricular white matter infarction on diffusion-weighted (onset) and T2-weighted image (3weeks later). (B) Diffusion tensor tractography (3weeks later). Focal degeneration of left corticobulbar tract (blue) adjacent to the infarction (red) and perilesional edema (transparent yellow). (C) Perilesional fractional anisotropy values decrease with the distance compared with 5 healthy controls.