

# Visuospatial Neglect Caused by Microbleeds involving the Superior Longitudinal Fasciculus : a case report

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## Background

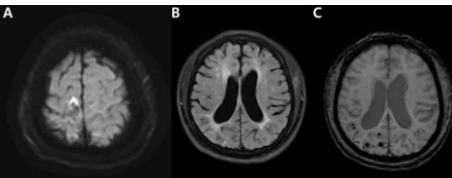
Visuospatial neglect is a neurological condition commonly found in patients with right hemispheric stroke. It occurs mainly due to damage to the superior longitudinal fasciculus, connecting the frontal and parietal lobes. We report a patient who manifested visuospatial neglect, which the stroke lesion could not explain but was explained by underlying cerebral amyloid angiopathy.

## Case Description

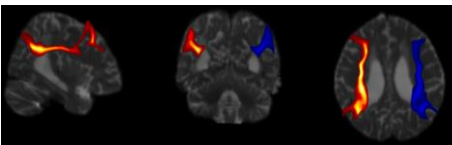
An 82-year-old male with atrial fibrillation visited our hospital complaining of left hemiplegia, mainly showing lower limb weakness. A lacunar infarction involving the right parasagittal motor cortex was found on the diffusion-weighted image (Figure 1A). The MRC grades of the ankle dorsiflexor and plantar flexor were grade 1, and those of the proximal lower limb, including hip and knee flexors and extensors, were grade 4.

The neurocognitive assessments revealed left visuospatial neglect that could not be explained by the stroke lesion (Figure 2). The patient showed allocentric neglect in the Daisy drawing and line bisection tests. The figure drawn by the patient was biased to the right, and the right side was enlarged when performing the Rey Complex Figure Test. The Susceptibility-weighted imaging (SWI) revealed numerous microbleeds in the right parietal and temporal lobes, suggesting cerebral amyloid angiopathy (Figure 1B) and 1C).

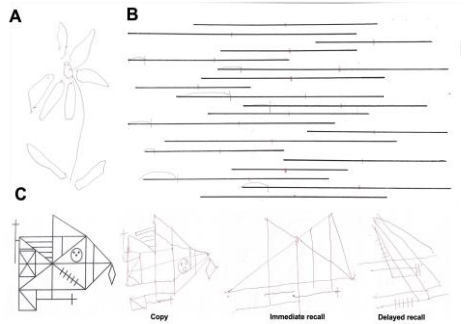
On the color fractional anisotropy map of the diffusion tensor imaging, the location of the microbleeds overlapped with the right superior longitudinal fasciculus (Figure 3).



**Figure 1.** Diffusion-weighted image shows a diffusion restriction area in the right parasagittal primary motor cortex, suggesting lacunar infarction (A). The microbleeds are not visible in FLAIR image (B), but the susceptibility-weighted image reveals the microbleeds in the right temporoparietal lobe (C).



**Figure 3.** The location of the microbleeds overlapped with the parietal part of the right superior longitudinal fasciculus template (red-yellow)



**Figure 2.** The neurocognitive assessments reveal left visuospatial neglect. In the Daisy drawing and line bisection tests, allocentric neglect are shown. (A, B) In the Rey Complex Figure Test, the figure is biased to the right, and the right side is enlarged. (C).

## Discussion

Cerebral amyloid angiopathy is a type of cerebrovascular disease in which  $\beta$ -amyloid peptide is deposited in small and medium blood vessels and leptomeningeal membranes of the brain. Lesions occur mainly in the posterior part of the brain and can cause posterior cortical atrophy, impairing visual processing. Cerebral amyloid angiopathy can be found regardless of cerebral infarction or hemorrhage lesion. A biopsy is required to confirm cerebral amyloid angiopathy, but if a biopsy is unavailable, the presence of microbleeds can be confirmed by the brain SWI. Previous studies have demonstrated that perivascular cells and microglia are involved in forming  $\beta$ -amyloid plaques and migrate along the vessel wall. Our patient also appeared to have the microbleeds distributed along the inferior division of the right middle cerebral artery. The findings of SWI and diffusion tensor imaging suggested that visuospatial neglect may result from the involvement of microbleeds in the right superior longitudinal fasciculus.

## Conclusion

Cerebral amyloid angiopathy can cause visuospatial neglect depending on the distribution of microbleeds. The SWI helps diagnose cerebral amyloid angiopathy and can help identify neurological manifestations which cannot be explained by conventional neuroimaging.