뇌신경재활

게시일시 및 장소 : 10 월 19 일(토) 08:30-12:30 Room G(3F)

질의응답 일시 및 장소 : 10 월 19 일(토) 11:00-11:30 Room G(3F)

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Thalamocortical connection changes with recovery of imparied consciousness in parietal lobe injury

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Objectives

we report on a stroke patient with a parietal lobe injury who showed recovery of impaired consciousness and increased thalamocortical connectivity to the frontoparietal lobe, which was demonstrated on diffusion tensor tractography (DTT) of the ascending reticular activating system (ARAS).

Case presentation

A 52-year-old female patient underwent craniectomy and hematoma removal for a spontaneous intracerebral hemorrhage in the left parietal lobe, as well as intraventricular and subarachnoid hemorrhages. When he started rehabilitation at approximately three months after onset she was in a vegetative state (VS) with a Coma Recovery Scale-Revised (CRS-R) score of 11. She underwent comprehensive rehabilitation including transcranial direct current stimulation of the left parietal lobe (centered on the supraparietal lobule) and repetitive transcranial magnetic stimulation of the mid-portion of the right intraparietal sulcus. After one month of rehabilitation, the patient had recovered to a nearly normal conscious state with a CRS-R score of 21. On DTT performed at 4-months after stroke onset, the right lower dorsal ARAS was observed to be thicker than that on DTT at 3-months post-stroke. Moreover, on 4-month DTT there was an increase in neural connections to the right frontoparietal lobes compared to that on 3-month post-onset DTT, the increase was particularly notable at the right medial prefrontal cortex and the precuneus.

Conclusion

Changes in the lower dorsal ARAS between the pontine reticular formation and the thalamic ILN and in the thalamocortical connections between the thalamic ILN and the cerebral cortex were demonstrated in a stroke patient who showed concurrent recovery from a vegetative state to a nearly normal conscious state. The results suggest that the changes observed in the medial prefrontal cortex and precuneus were mainly responsible for the patient's recovery from a vegetative state to a nearly normal conscious state.

Acknowledgment :This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean Government(MSIP) (No. 2018R1A2B6000996).

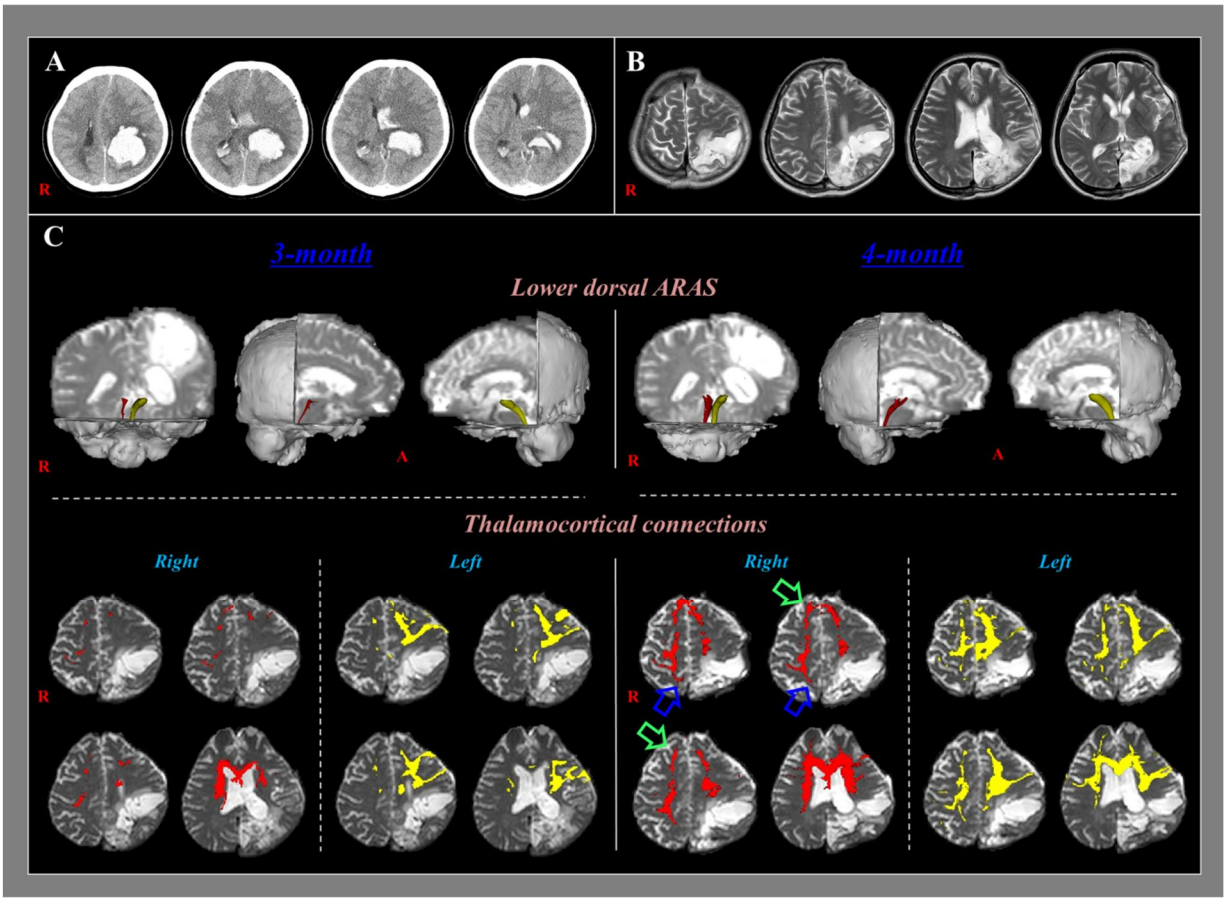

Fig 1. (A) Brain computed tomography images at onset show hematoma in the left parietal lobe and subfalcine herniation. (B) Brain magnetic resonance images at three months after onset reveal leukomalactic lesions in the left parieto-occipital lobes. (C) Results of diffusion tensor tractography (DTT). On 4-month post-onset DTT, thickening of the right lower dorsal ARAS is observed compared with that on 3-month DTT. Decreased neural connections to the right frontoparietal lobes on 3-month DTT are shown to be increased on 4-month DTT, especially in the right medial prefrontal cortex (green arrows) and precuneus (blue arrows).