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)

P 3-75

Impaired consciousness due to injury of ARAS in a patient with pontine infarct

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The ascending reticular activating system (ARAS) is known to play an essential role in maintaining arousal and consciousness. Several studies have reported the association between injury of the ARAS and impaired consciousness in patients with pontine hemorrhage, traumatic brain injury, and hypoxic-ischemic brain injury using recently developed diffusion tensor tractography (DTT) derived from diffusion tensor imaging (DTI) technique. However, the evaluation of the ARAS using DTT in patients with impaired consciousness following pontine infarction is limited. In this case report, we describe a patient with impaired consciousness and injured ARAS after bilateral pontine infarction.

A 73-year-old female patient presented with anterior chest pain to the emergency department of our university hospital. She had suffered from typical anterior chest pain radiating to the back for three days. She was diagnosed with chronic stable angina pectoris, three-vessel disease, and chronic total occlusion of left anterior descending artery by the coronary angiography (CAG) and received conservative treatment. Five days after the CAG, she showed decreased mentality and her brain MRI revealed bilateral paramedian pontine infarction (Figure 1A). At four weeks after the pontine infarction, the patient was transferred to the department of physical medicine and rehabilitation. She showed severely impaired consciousness, with a Glasgow Coma Scale score of 7 (eye opening: 2, best verbal response: 2, and best motor response: 3) and Coma Recovery Scale-Revised score of 10 (auditory function: 2, visual function: 3, motor function: 2, verbal function: 2, communication: 0, and arousal: 1). Diffusion tensor imaging data was acquired at four weeks after the onset of pontine infarction and the three portions of the ARAS (namely lower dorsal ARAS, the lower ventral ARAS, and the upper ARAS) were reconstructed using regions of interest (ROI) as follows: for the lower dorsal ARAS, the pontine reticular formation and the intralaminar thalamic nucleus; for the lower ventral ARAS, pontine reticular formation and the hypothalamus; and for the upper ARAS, the intralaminar thalamic nucleus to the cerebral cortex. The neural connectivity in the upper ARAS between the thalamic intralaminar nucleus and the cerebral cortex was impaired in both hemispheres, as well as the left lower dorsal ARAS and both lower ventral ARAS (Figure 1B). The injured ARAS revealed by the DTT might be associated with the impaired consciousness of the patient in this case. To the best of our knowledge, this is the first report of injured ARAS in bilateral pontine infarction revealed by DTT. Further studies

with larger number of patients and follow-up data would be needed for the better understanding of the relationship between injured ARAS and impaired consciousness, its prognosis, and the implications for establishing the rehabilitation strategy.

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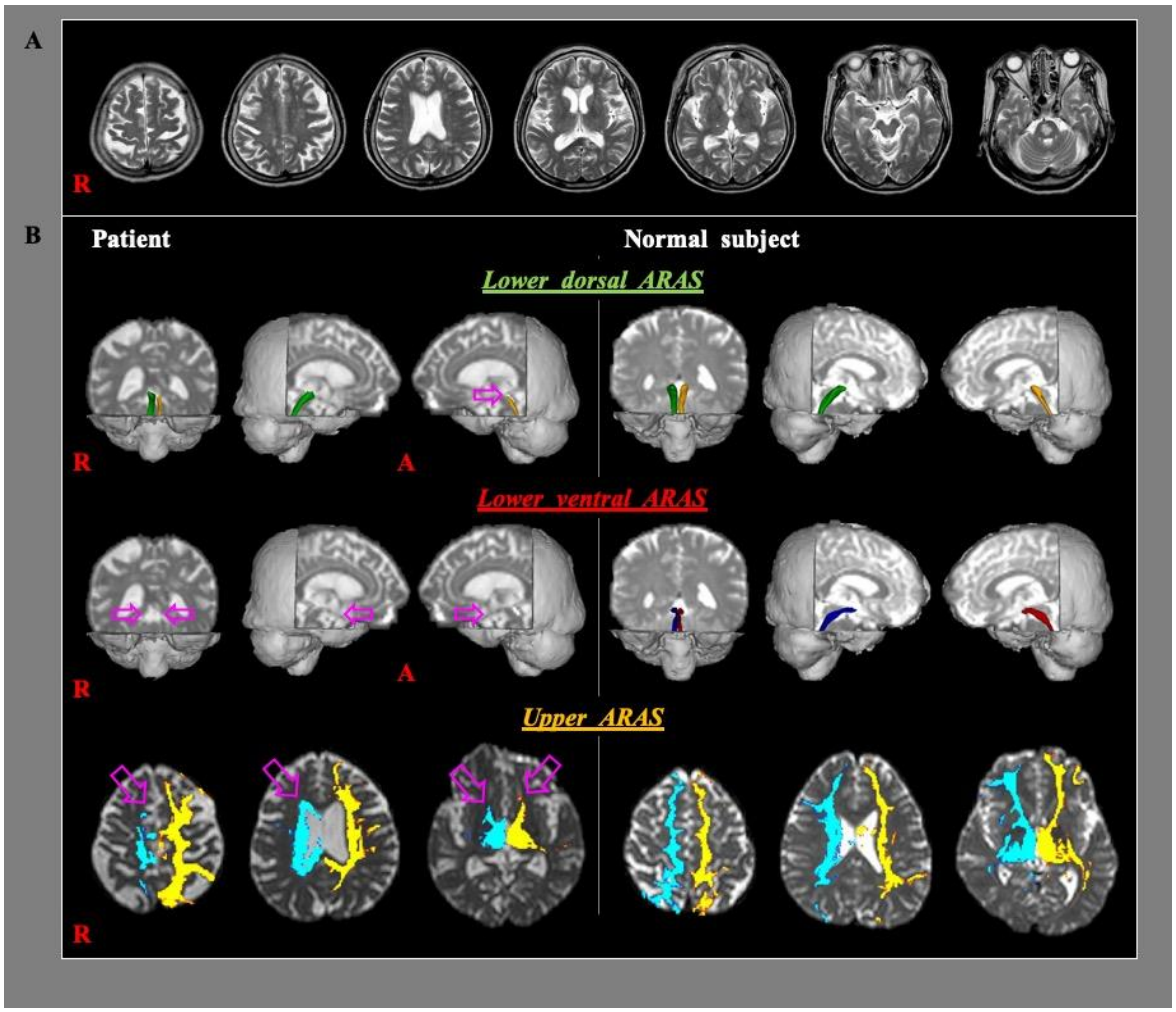

Fig1.