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Relationship between ataxia and the ICP injury in patients with cerebral infarct

Han Do Lee [1†], Sung Ho Jang [1†], Dong Gyu Kwak[1*†]

College of Medicine, Yeungnam University, Department of Rehabilitation Medicine[1]

Introduction

The inferior cerebellar peduncle (ICP) is a major neural tract in the cerebellum involved in coordination of movement and proprioceptive, therefore, injury of the ICP can be accompanied by poor coordination of movement, including ataxia. In this study, using diffusion tensor tractography (DTT), we attempted to investigate the relationship between ataxia and injury of the ICP in patients with cerebral infarct.

Methods

We recruited 14 stroke patients with ataxia after the onset of stroke, and 12 normal subjects. The score of assessment and rating of ataxia (SARA) was used to evaluate of ataxia. The values of fractional anisotropy (FA), apparent diffusion coefficient, and fiber number (FN) of the ICP were used for the diffusion tensor imaging parameters.

Results

Significant differences were observed in the values of the FA and FN of the ICP in the affected hemisphere between the patient and control groups ($p < 0.05$). In addition, the FN value of the ICP in the affected hemisphere showed negative correlation with SARA score ($r = -0.538$, $p < 0.05$). However, parameters of the ICP in the unaffected hemisphere or the FN value in the unaffected hemisphere showed no correlation with SARA score ($p > 0.05$).

Conclusion

We found that the ataxia severity was closely related with the injury severity of the ICP in patients with cerebral infarct. Our results suggest that the evaluation of the ICP state using DTT would be useful for patients with ataxia following cerebral infarct.

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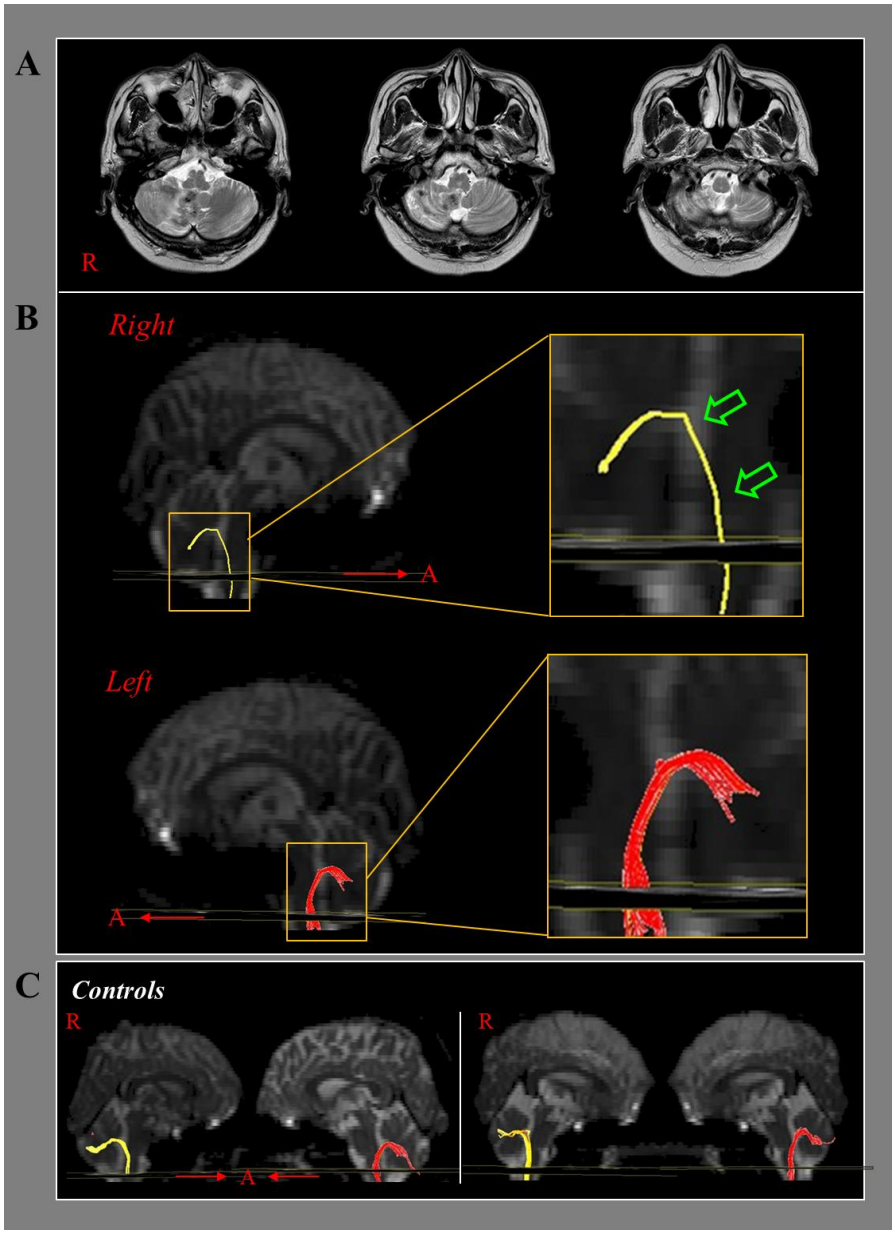

Figure. 1 (A) T2-weighted brain magnetic resonance images show an infarct in the right cerebellum in a representative patient (61-year-old female). (B) Diffusion tensor tractography (DTT) results of the inferior cerebellar peduncle (ICP) in the above patient showed narrowing(green arrows) in the right side compared with the left side and control subjects. (C) DTT results for the ICP in two representative control subjects (58-year-old female and 60-year-old female).