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Central pain due to spinothalamic tract injury in post-concussion syndrome

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Objectives

In this study, we investigated the relationship between spinothalamic tract (STT) injury and central pain in patients with post-concussion syndrome (PCS).

Methods

Fifty-six patients with PCS and 42 healthy control subjects were recruited. A visual analog scale (VAS) was used for evaluating central pain. PCS patients were recruited based on the PCS criteria of the International Classification of Diseases-10 (ICD-10). Fractional anisotropy (FA), mean diffusivity (MD), and tract volume (TV) values of the reconstructed STT were determined for both hemispheres.

Results

The TV value was significantly lower in the patient group than the control group ($p < 0.05$). However, significant differences in FA and MD values of the STT were not observed between the patient and control groups ($p > 0.05$). The VAS was not significantly correlated with the TV value ($r = 0.15$, $p > 0.05$) or with the number of PCS symptoms on ICD-10 ($r = -0.02$, $p > 0.05$). In addition, the TV value was not significantly correlated with the number of PCS symptoms on ICD-10 ($r = 0.08$, $p > 0.05$).

Conclusions

We observed that STT injury was associated with central pain in patients with PCS. Our results suggest that STT injury is a pathophysiological etiology of central pain in PCS.

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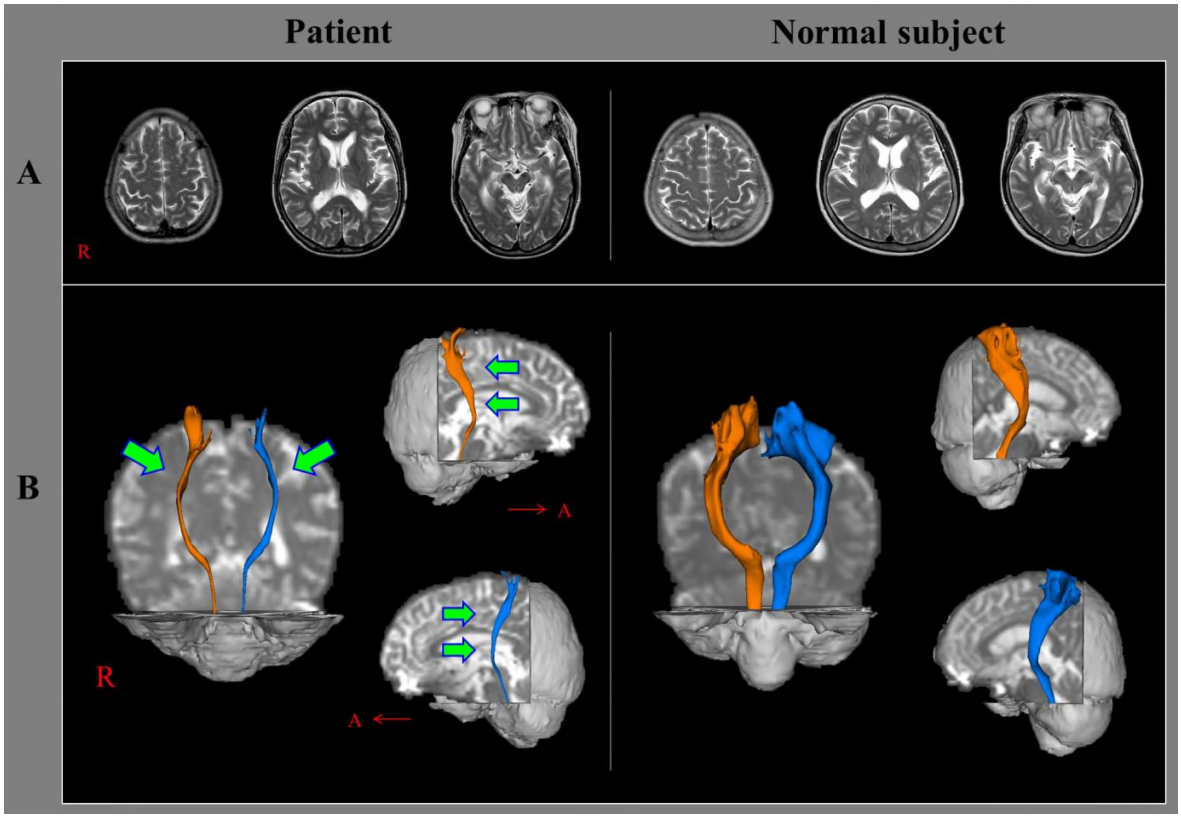

Brain magnetic resonance (MR) images and diffusion tensor tractography results for the spinothalamic tract in a representative patient and a control subject.