

Traumatic axonal injury of the STT without clinical manifestation of mild TBI at the onset of trauma

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Objectives

We report on a patient with mild traumatic brain injury (TBI) who did not exhibit any clinical manifestations of mild TBI at the onset of head trauma but developed central pain due to traumatic axonal injury (TAI) of the spinothalamic tract (STT), as demonstrated by using diffusion tensor tractography (DTT).

Case descriptions

A 36-year-old female experienced head trauma resulting from an in-car traffic accident: a slowly approaching car collided with the right side of her car while she was sitting in the backseat. During the collision, she was looking toward the front of the car and her head appeared to be shaken mildly but without direct head trauma. Her Glasgow Coma Scale score was 15 upon arrival at the hospital. She mentioned that she did not experience loss of consciousness or post-traumatic amnesia at the time of the head trauma. In addition, she did not experience any alteration in mental state (e.g., no dazed, disoriented, or confused feelings) or focal neurological deficit at the time of the accident. However, she began to feel left shoulder pain at approximately eight hours after the accident. The next day, she began to feel pain in the left hand and right leg, which spread with the passage of time. As a result, she felt pain in both arms and legs beginning four days after the accident. At seven days after onset, she visited our clinic and described her pain as having tingling and electrical shock-like characteristics, but she reported no allodynia or hyperalgesia (Visual Analog Scale pain score: 6). On 7-day DTT, the patient's right STT showed severe narrowing and partial tearing in the subcortical white matter compared with that in the left STT.

Conclusion

TAI of the STT was demonstrated in a patient who developed central pain without any clinical manifestation of mild TBI after a mild whiplash injury. Our results suggest that TAI can occur without any clinical manifestation of mild TBI in mild whiplash injury cases.

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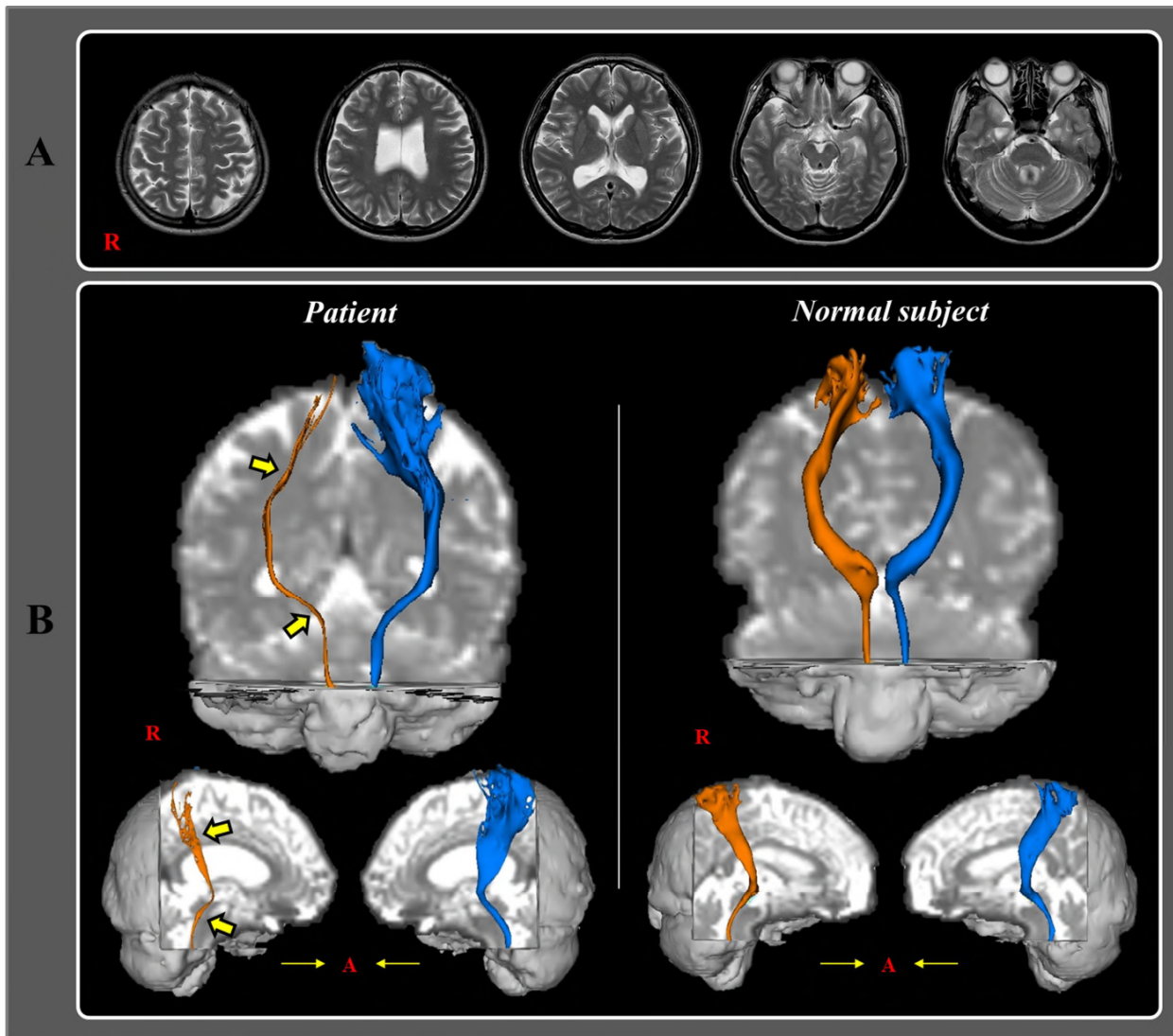


Fig. 1. (A) Brain magnetic resonance images obtained seven days after head trauma onset show no definite lesions. **(B)** Results of diffusion tensor tractography performed 7 days after onset. The right spinothalamic tract shows severe narrowing and partial tearing in the subcortical white matter (yellow arrow) compared with those of the patient's left side and those of a normal subject (38-year-old female).