

Chronic severe quadriparesis due to combined apraxias in a patient with traumatic brain injury

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Objectives

We report on a traumatic brain injury (TBI) patient with chronic severe quadriparesis caused by combined limb-kinetic and callosal apraxias due to corticofugal tract (CFT) and corpus callosum (CC) fiber injuries, which were demonstrated by applying diffusion tensor tractography (DTT).

Case description

A 35-year-old right-handed male patient had suffered from head trauma resulting from an accidental collision with a car while riding a motorcycle. He underwent CT-guided stereotactic extraventricular drainage for traumatic intraventricular hemorrhage and conservative management for traumatic subarachnoid hemorrhage and traumatic multifocal microhemorrhage in both prefrontal and parietal cortices. The patient exhibited complete weakness of both upper and lower extremities at the onset of TBI (Manual Muscle Test: right 0, left 0). At 16 months after onset, he showed severe quadriparesis of both upper and lower extremities (Manual Muscle Test: both shoulder abductors, 2- [20°]; both elbow extensors, 2- [30°]; both finger flexors and extensors, 0; both hip flexors, 2- [20°]; knee extensor, 2- [20°]; and ankle dorsiflexor, 0). On 16-month DTT, the right corticospinal tract showed partial tearing at the subcortical white matter. In addition, injuries to both CFTs from the secondary motor area, and the CC fibers from the primary motor cortex and secondary motor area were observed in both hemispheres.

Conclusions

By using DTT, combined limb-kinetic and callosal apraxias due to injuries to the CFT from the secondary motor area and CC fibers were demonstrated in a patient with chronic severe quadriparesis following TBI.

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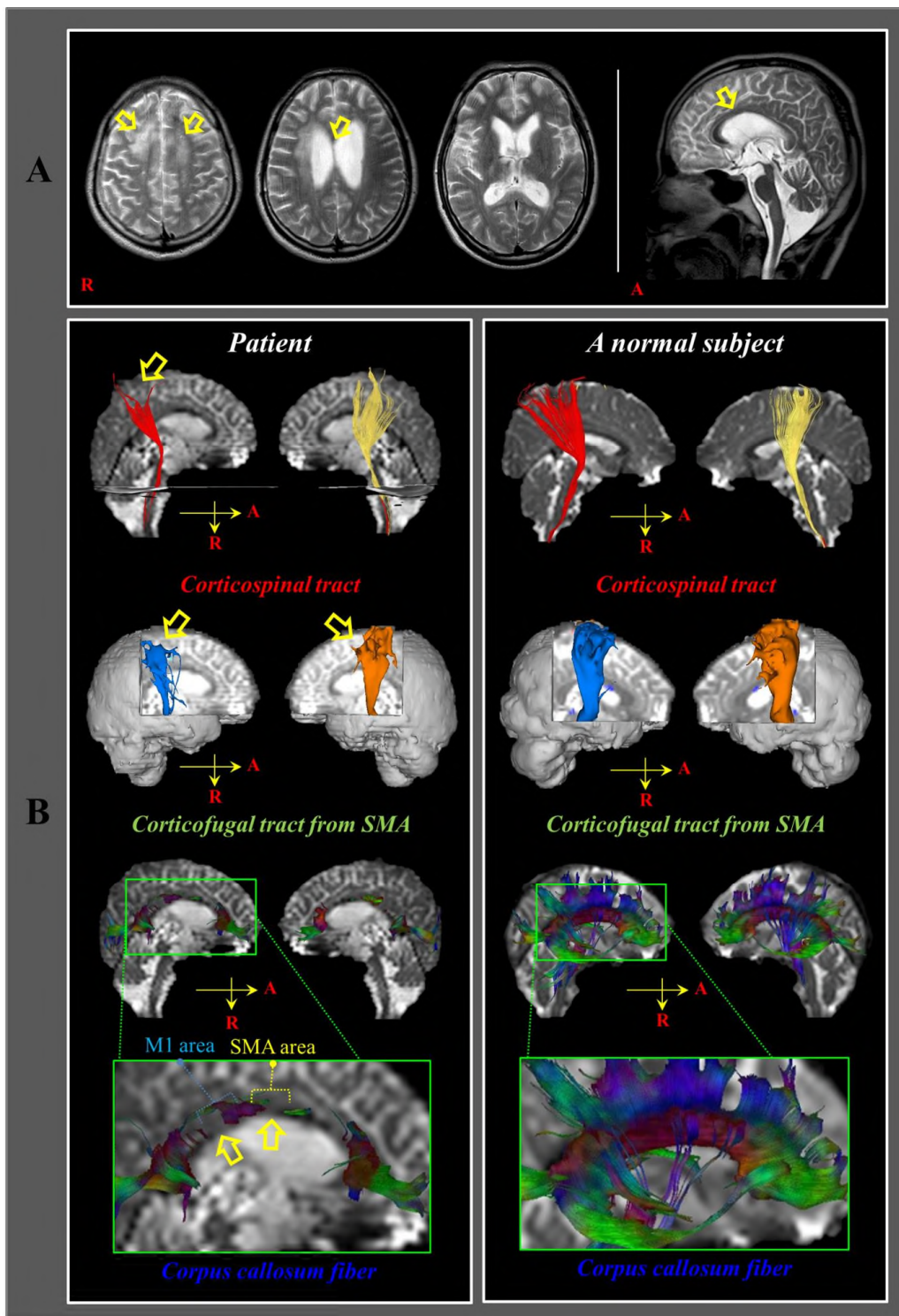


Fig. 1. (A) T2-weighted magnetic resonance images at 16 months after onset show leukomalactic lesions in both prefrontal lobes and the subcortical white matter (arrows) and in the thinned body of corpus callosum (arrow). **(B)** On 16-month diffusion tensor tractography, a partial tearing at the subcortical white matter (arrow) is observed in the right corticospinal tract. The corticofugal tracts from the secondary motor area (SMA) show narrowing (right) and partial tearing (both, arrows) compared to that in a normal subject (35-year-old male). Injuries of the corpus callosum fibers from the primary motor cortex (M1) and the SMA in both hemispheres are also present (arrow).