

# Teaching NeuroImages: Longitudinal Motor Pathway Reorganization After Hemorrhagic Stroke on Diffusion Tensor Tractography

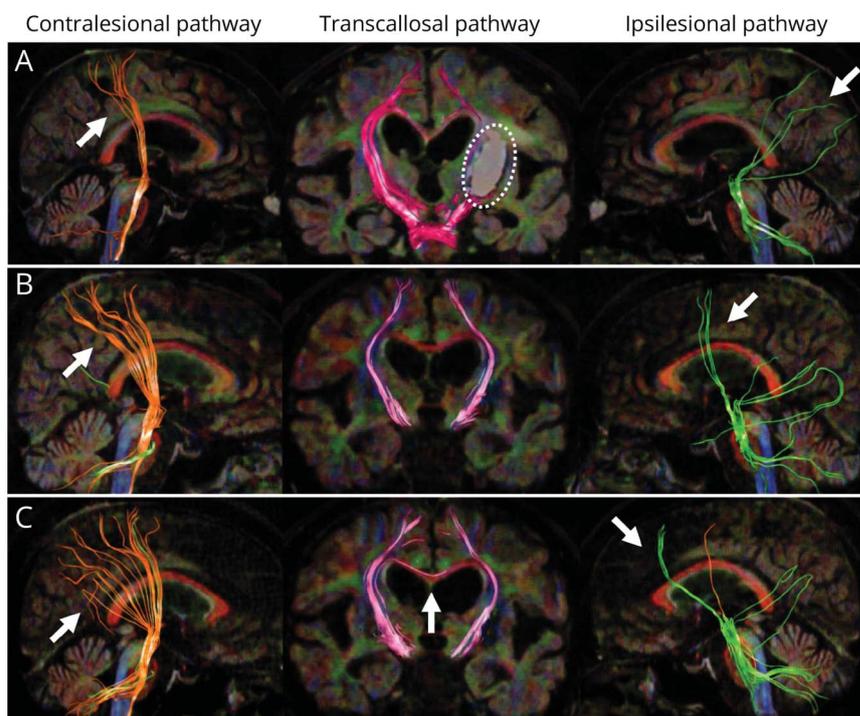
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## Figure Serial DTT Findings



DTT at 1 (A), 5 (B), and 6 (C) months poststroke. The dotted line represents the lesion. Ipsilesional pathways shift sequentially from posterior parietal cortex (A) to supplementary motor area (B) and to premotor cortex (C). Contralesional and cerebellar connections intensified, while transcallosal pathways fluctuated. Arrows indicate respective pathways. DTT = diffusion tensor tractography.

A 74-year-old man developed severe right hemiplegia (Brunnstrom stage [BRS] I: flaccid upper limb and fingers) after left putaminal hemorrhage; BRS is a 6-stage motor recovery scale. Following 4 months of conventional inpatient rehabilitation (5 months poststroke), he plateaued at BRS II (emergence of spasticity). After initiating a virtual reality-based somato-cognitive coordination therapy for 3 weeks,<sup>1</sup> he improved to BRS III (voluntary movement) 6 months poststroke. Serial diffusion tensor tractography (DTT) demonstrated longitudinal reorganization patterns (Figure). The ipsilesional descending motor pathways from the posterior parietal cortex shifted anteriorly to the supplementary motor area and subsequently involved the premotor cortex. Concurrently, posterior contralesional descending motor pathways and cerebellar connections intensified over time, while transcallosal pathways fluctuated with transient attenuation before re-emerging.<sup>2</sup> DTT

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provided objective evidence of structural reorganization underlying clinical recovery. Motor pathway reorganization may occur even after the first 5 months of hemorrhagic stroke, reflecting the brain's adaptive capacity over time.

### Author Contributions

M. Hara: drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; study concept or design; analysis or interpretation of data. T. Kisa: drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; study concept or design; analysis or interpretation of data.

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