Figure. MR diffusion tensor tractography² findings (Siemens AVANTO; 1.5 Tesla; $b = 1000$ s/mm²; six diffusion directions; voxel size $2 \times 2 \times 2$ mm³; fractional anisotropy > 0.2 ; turning angle $< 65^\circ$) of the two patients (A–C; D–F) and a healthy 21-year-old woman (G–I), displayed in random colors on unweighted ($b = 0$ s/mm²) diffusion images. (A, D, G) Axial planes, inferior view (red = region of interest for the tracking algorithm); (B, E, H) Coronal planes, anterior view; (C, F, I) Tilted axial planes, anterior-lateral-superior view. In the control subject, the region of interest was drawn on a diffusion color map (not shown) to include all fibers with a cranio-caudal orientation of this axial plane.

Extensive peri-lesional connectivity in congenital hemiparesis

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Two patients with congenital hemiparesis (#5 and #7 in reference¹) showed a striking discrepancy between large, pre- and perinatally acquired middle cerebral artery infarctions and relatively

preserved sensorimotor functions. Despite the large cystic lesions, the affected hemispheres possessed spino-thalamo-cortical somatosensory afferents as well as cortico-spinal motor efferents. This was shown by magnetoencephalography during repetitive tactile finger stimulation and focal transcranial magnetic stimulation. Accordingly, magnetic resonance (MR) diffusion tensor tractography² (figure) visualized numerous trajectories passing through the narrow bridge of preserved white matter between the lateral ventricle and the infarcted area, providing extensive structural connectivity of fronto-parietal areas with the brainstem and the cerebellum. Although these findings are suggestive of a superior reorganizational capability of the developing human brain, further studies (including tractography data from patients with similar lesions acquired later in life) will be needed to clarify this point.

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