Teaching NeuroImages: Diffusion tensor tractography of cortico-ponto-cerebellar pathways in Rasmussen encephalitis

A 34-year-old man developed since age 18 years epilepsy partialis continua followed over the years by progressive ataxic hemiparesis involving the left side (figure 1).

Structural cerebral abnormalities, mitochondrial diseases, and known autoimmune disorders were excluded. Cerebral MRI showed progressive right cerebral and crossed left cerebellar hemiatrophy (figure 2, A and B).

Tractography of cortico-ponto-cerebellar (CPC) pathways demonstrated marked involvement of the right tract, suggesting that a dying-back mechanism of efferent CPC fibers may cause crossed cerebellar atrophy. We infer that crossed cerebellar atrophy is a distinctive feature of long-term Rasmussen encephalitis evolution.

AUTHOR CONTRIBUTIONS
Roberto Michelucci: drafting/revising the manuscript, study concept or design, analysis or interpretation of data, accepts responsibility for conduct of research and final approval, study supervision. Elena Pasini: drafting/revising the manuscript, study concept or design, accepts responsibility for conduct of research and final approval, study supervision. Federica Anna Marliani: study concept or design, accepts responsibility for conduct of research and final approval, study supervision. Luigi Cirillo: drafting/revising the manuscript, accepts responsibility for conduct of research and final approval, neuroradiologic evaluation.

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The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

REFERENCES

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Coronal T1-weighted images performed in 2007 (A) and 2011 (B) show progressive right cerebral and left cerebellar atrophy consistent with crossed cerebellar diaschisis. Right cortico-ponto-cerebellar axonal loss was demonstrated by specific diffusion tensor imaging software for tractography in 2011 (D) as compared to 2007 (C).
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