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

Roberto Michelucci, MD,
PhD*
Elena Pasini, MD*
Federica Anna Marliani,
MD*
Luigi Cirillo, MD*

Correspondence to
Dr. Pasini:
elenapasini123@gmail.com

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.¹ Cerebral MRI showed progressive right cerebral and crossed left cerebellar hemiatrophy (figure 2, A and B).

Tractography of cortico-ponto-cerebellar (CPC) pathways² (figure 2, C and D) 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, analysis or interpretation of data, 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, acquisition of data. Luigi Cirillo: drafting/revising the manuscript, accepts responsibility for conduct of research and final approval, neuroradiologic evaluation.

STUDY FUNDING

No targeted funding reported.

DISCLOSURE

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

REFERENCES

1. Varadkar S, Bien CG, Kruse CA, et al. Rasmussen's encephalitis: clinical features, pathobiology, and treatment advances. *Lancet Neurol* 2014;13:195–205.
2. Kamali A, Kramer LA, Frye RE, Butler IJ, Hasan KM. Diffusion tensor tractography of the human brain cortico-ponto-cerebellar pathways: a quantitative preliminary study. *J Magn Reson Imaging* 2010;32:809–817.

Figure 1 Clinical features over a 22-year history

IgG = immunoglobulin G.

Download teaching
slides: Neurology.org

*These authors contributed equally to this work.

From IRCCS–Institute of Neurological Sciences, Units of Neurology (R.M.) and Neuroradiology (F.A.M., L.C.), and the Department of Biological and Neuromotor Sciences (E.P.), Bellaria Hospital, Bologna; and DIMES (L.C.), Department of Specialty, Diagnostic and Experimental Medicine, University of Bologna, Italy.

Figure 2 MRI and tractography evolution

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).

Neurology®

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

Roberto Michelucci, Elena Pasini, Federica Anna Marliani, et al.

Neurology 2015;85:e15-e16

DOI 10.1212/WNL.0000000000001733

This information is current as of July 13, 2015

Updated Information & Services	including high resolution figures, can be found at: http://n.neurology.org/content/85/2/e15.full
Supplementary Material	Supplementary material can be found at: http://n.neurology.org/content/suppl/2015/07/11/WNL.0000000000001733.DC1
References	This article cites 2 articles, 0 of which you can access for free at: http://n.neurology.org/content/85/2/e15.full#ref-list-1
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): DWI http://n.neurology.org/cgi/collection/dwi Encephalitis http://n.neurology.org/cgi/collection/encephalitis MRI http://n.neurology.org/cgi/collection/mri Prognosis http://n.neurology.org/cgi/collection/prognosis Status epilepticus http://n.neurology.org/cgi/collection/status_epilepticus
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.neurology.org/about/about_the_journal#permissions
Reprints	Information about ordering reprints can be found online: http://n.neurology.org/subscribers/advertise

Neurology® is the official journal of the American Academy of Neurology. Published continuously since 1951, it is now a weekly with 48 issues per year. Copyright © 2015 American Academy of Neurology. All rights reserved. Print ISSN: 0028-3878. Online ISSN: 1526-632X.