Teaching *NeuroImages*: Brain MRI and FDG-PET in malformations of cortical development and hippocampal hypoplasia

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A 16-year-old intellectually normal woman, with a history of febrile seizures, presented with focal seizures. MRI showed several regions of polymicrogyria/pachygyria, cortical heterotopia, and left hippocampal hypoplasia, associated with (interictal) FDG-PET hypometabolism (figure). Other examinations did not show evidence of tuberous sclerosis.

This case is an example of the frequent coexistence of different types of malformations of cortical development and hippocampal abnormalities, referred to as dual pathology.^{1,2} Dual pathology is important when making decisions about surgery for refractory epilepsy. Although prolonged febrile seizure is a risk factor of temporal lobe epilepsy, it is not clear whether febrile seizure provokes hippocampal abnormalities.

AUTHOR CONTRIBUTIONS

Dr. Renard: drafting/revising the manuscript, study concept or design, analysis or interpretation of data, acquisition of data, study supervision. Dr. Castelnovo: study concept or design, acquisition of data, study supervision. Dr. Daubin: study concept or design, analysis or interpretation of data, acquisition of data. Dr. Collombier: analysis or interpretation of data, acquisition of data. Dr. Briere: analysis or interpretation of data, acquisition of data. Dr. Labauge: drafting/revising the manuscript, study concept or design, contribution of vital reagents/tools/patients, acquisition of data.

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Figure Imaging

MRI shows regional, thickened and flat, hyperintense cortex (arrows) on axial fluid-attenuated inversion recovery sequences (sometimes with subcortical hyperintensity, arrowheads) (A–E), multiple subependymal (arrowheads) and subcortical (arrows) cortical heterotopia (F, coronal T2-weighted imaging), and left hippocampal atrophy and mild internal architecture loss (G, coronal T2-weighted imaging). FDG-PET (H–J) demonstrates multifocal cortical (arrows) and left mesial temporal hypometabolism (arrowheads).

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