A peculiar EEG pattern of "Intermittent Extreme Delta Brush" in a patient with autoimmune encephalitis

P. Falchi◦, S. Kovac•, B. Diehl•, G.P. Sechi◦ and T. Wehner•

National Hospital for Neurology and Neurosurgery, Department of Clinical Neurophysiology, London, and Department of Clinical and Experimental Epilepsy, University College London, London, UK•,

Department of Clinical and Experimental Medicine, University of Sassari, Sassari, Italy.◦

Introduction:

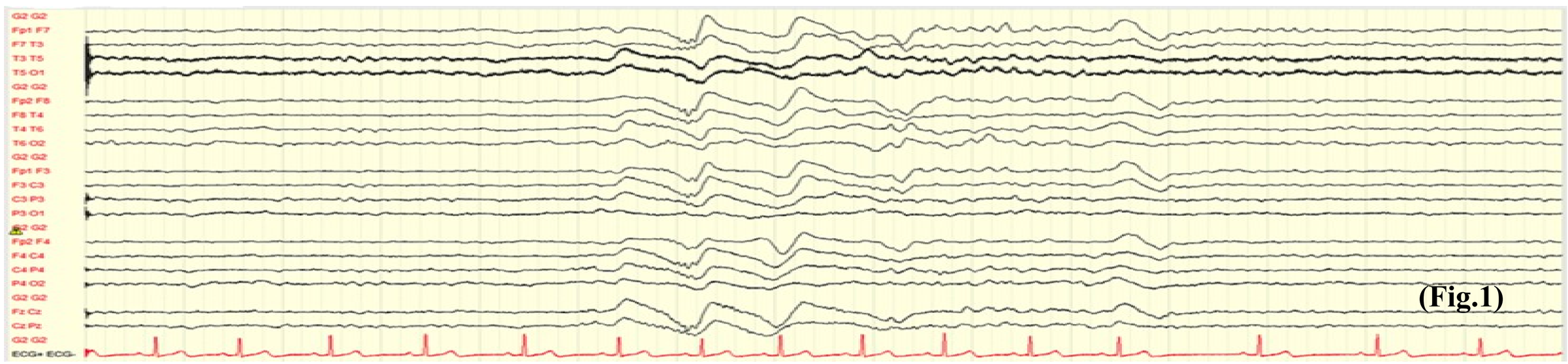
The electroencephalogram (EEG) is often abnormal in all types of autoimmune encephalitis. Except for the "*extreme delta brush*" that may occur in patients with anti-NMDAR encephalitis, there are no pathognomonic EEG abnormalities for any other form of autoimmune encephalitis.[1,2] We report a woman with autoimmune encephalitis who showed a peculiar EEG pattern reminiscent of "*extreme delta brush*" but with intermittent presentation.

Methods and results:

A previously healthy 34-year old woman presented with a two week history of a flu-like illness. On the day prior to admission, she became confused, febrile and developed diplopia. On **neurologic examination**, she was somnolent, unable to follow commands and showed oral automatisms. **Brain MRI** and **whole body 3D-PET/CT** were normal. **CSF** was otherwise normal except for a significant intrathecal IgG synthesis with positive oligoclonal bands, suggesting a predominantly intrathecal immune process.

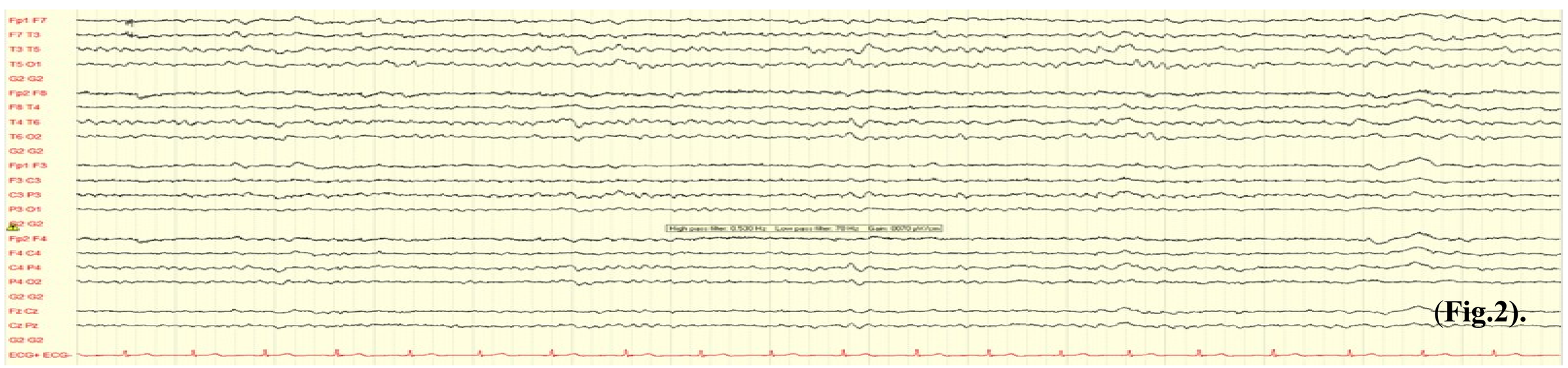
PCR for neurotrophic viruses, including HSV, were negative. **IgM and IgG** against GM1-2, GD1a-b and GQ1b; anti-GAD; Purkinje cells, other cerebellar cells, IgG white matter (myelin), anti-Hu,-Yo,-Ri, Ma-1, Ma-2,-CV2; anti-amphiphysin, anti-Zic-4, anti-Sox1, anti-VGKC were all negative in serum; anti-NMDA were negative in serum and CSF.

EEG recorded at admission showed intermittent generalized rhythmic delta activity with small amount of superimposed faster activity, **(Fig.1).**



(Fig.1)

She underwent 3 cycles of plasmapheresis. **Nine days later**, she was alert, oriented to time, place and person, and able to cooperate with verbal commands and mental activation tasks. The **EEG** showed great improvement, the aforementioned abnormality was no longer present, **(Fig.2).**



(Fig.2).

Conclusions:

The clinical presentation in line with the CSF findings, and the prompt response to plasma exchange, suggest an autoimmune encephalitis with antibodies against neuronal cell surface or synaptic proteins. This is further supported by the EEG finding reminiscent of the "*extreme delta brush*" that is considered highly specific for anti-NMDA encephalitis.

Bibliography:

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2.Armangue, T., M.J. Titulaer, I. Malaga, et al. Pediatric anti-N-methyl-D-aspartate receptor encephalitis clinical analysis and novel findings in a series of 20 patients. J. Pediatr. 2013.162: 850–856.

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