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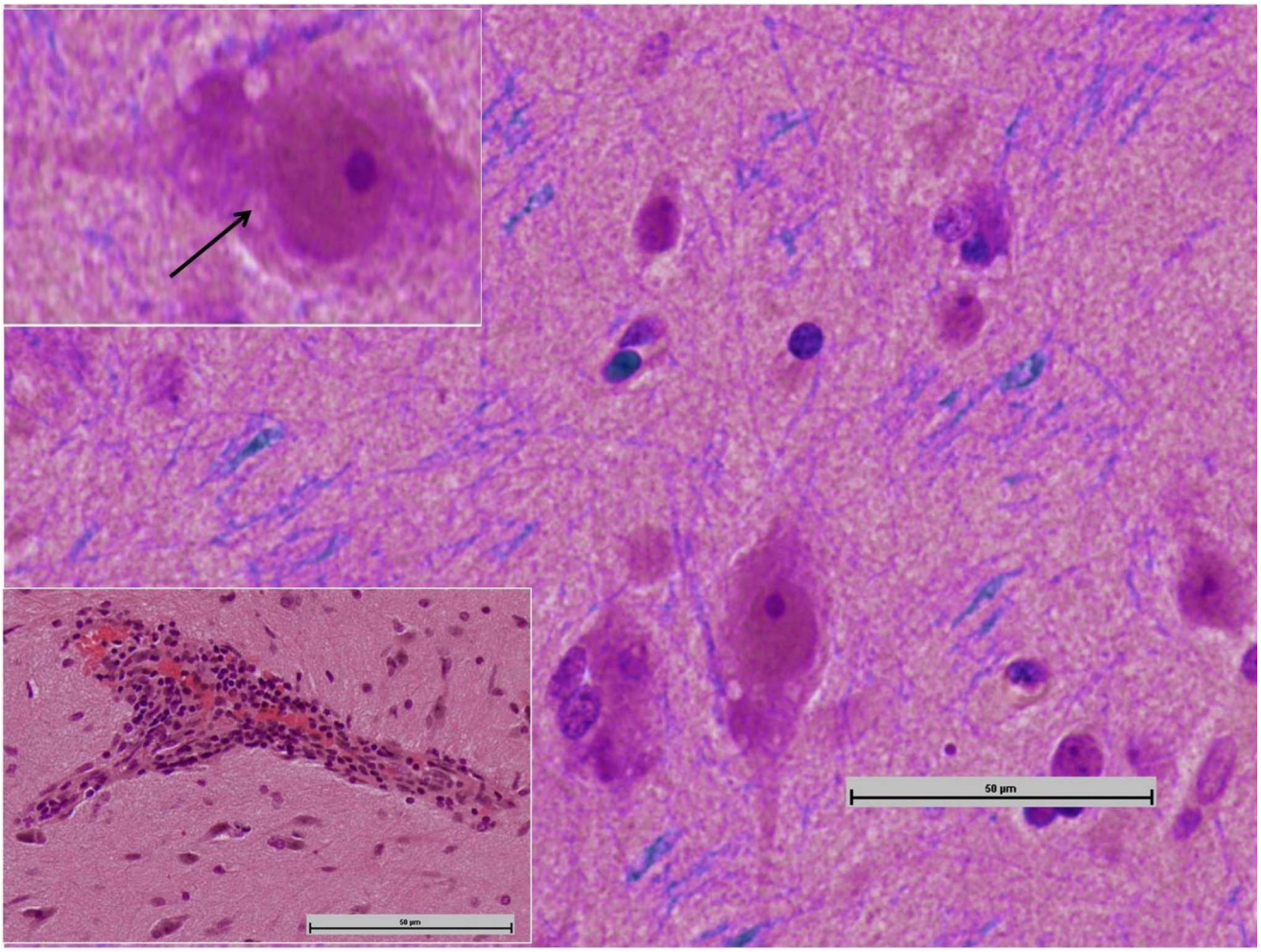
Data supplement

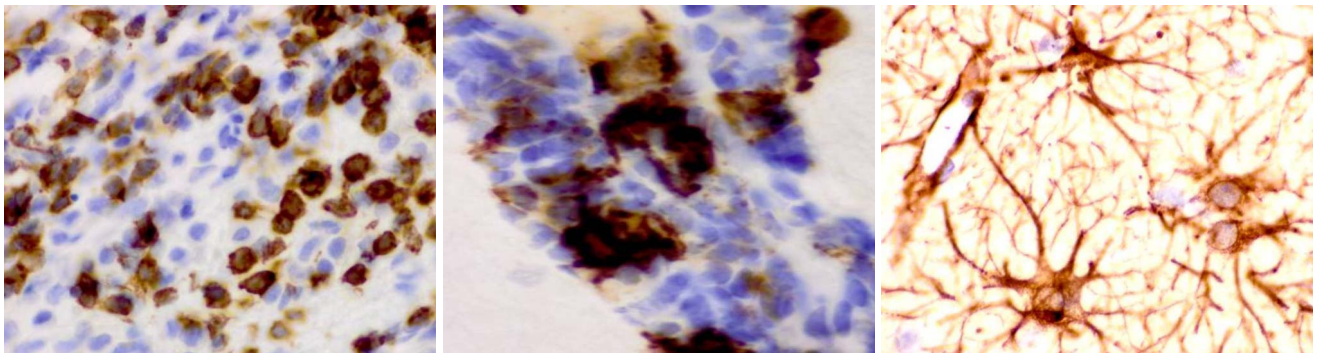
Table DS1 Characteristics and clinical features of case studies 1 to 4

Case	Initial differential diagnosis	Prodrome	Neuropsychiatric symptoms	Catatonia or reduced responsiveness	Hyperkinesis/ seizure like movements	Recovery/ complication	Positive findings
1	Conversion disorder Encephalitis	Slurred speech, concentration impairment	Disinhibition, aggression	Mutism	Orofacial dyskinesia	Less severe relapse	EEG slowing, status epilepticus, raised leucocytes in CSF
2	Psychotic disorder Meningioencephalitis/ limbic encephalitis	Lethargy, hypersomnia	Irritability, agitation, delusions, visual hallucinations		Cycling leg and arm movements with no EEG epileptiform activity	Some cognitive deficits	EEG slowing, necrotic dermoid ovarian cyst, CSF lympocytosis
3	Conversion disorder Postpartum psychosis Encephalitis	Sudden onset	Delusions, mood lability	Echopraxia, echolalia, posturing	Cycling leg movements with no EEG epileptiform activity	Recovery to baseline	EEG slowing
4	Viral encephalitis Psychotic disorder	Slurred speech, fatigue	Mood lability, agitation, delusions	Slowed in speech and movement	Coarse leg and arm movements	Gradual recovery, remains on immunosuppressant	EEG slowing, white matter abnormalities on brain MRI, lymphocytic infiltrate on brain biopsy, CSF lymphocytosis

CSF, cerebrospinal fluid; EEG, electroencephalograph; MRI, magnetic resonance image.
Neuropsychiatric symptoms, catatonia/reduced responsiveness and hyperkinesis/seizure-like movements overlapped and were non-sequential.



(a)



(b) (c) (d)

Fig. DS1 Histological analysis of encephalitis.

(a) Right frontal sample. Neurons displayed various abnormalities. The most striking pathology was vacuolisation of the perikaryon and most of the vacuoles contained small granules (granulovacuolar degeneration; a phenomenon not known in this age group). The granules were often amphophilic, or light eosinophilic, rarely basophilic (see arrow in insert top left. Luxol Fast Blue). Lymphoplasmacytic inflammation was seen mostly within the Virchow–Robin spaces as well as in the leptomeninges (see inset bottom left). (b) CD20 antibody decorates B lymphocytes. (c) CD3 immunohistochemistry. T-cells (brown, positive reaction product) slightly outnumber B-cells (negative with this antibody), but this difference is insignificant. (d) Glial fibrillary acidic protein immunohistochemistry specifically and strongly decorates richly arborised reactive astrocytes.

Microscopic exam and immunohistochemistry of biopsy

Microscopic examination

Microscopic examination of serial paraffin sections revealed normal dura mater with negligible perivascular lymphocytic accumulation. Normal neocortical cytoarchitecture was observed. The Virchow–Robin spaces were widened and often contained variable numbers of regularly shaped small lymphocytes. Mild microglial activation and somewhat increased perineuronal satellitosis without neuronophagia were noted. Neuronal necrosis, red neurons, inclusions were not observed. Scattered neurons with granulovacuolar degeneration were conspicuous.

Immunohistochemistry

Diffuse, strong leucocyte common antigen decoration, with partial CD20 and CD3 positivity characterised the lymphocytes with slight T-cell dominance. Activated microglial cells and a few macrophages were highlighted by Kp1 and PGM1 antibodies. Glial fibrillary acidic protein showed richly arborised reactive astrocytes. Synaptophysin, S-100 and chromogranin A reactions were normal. Luxol Fast Blue staining did not show demyelination. NeuN, NF52 and NF312 antibodies revealed no pathognomonic neuronal changes.