LPDs Redirect the Diagnostic Path in Structural Epilepsy: A Case Report of Varicella Encephalitis

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Case presentation

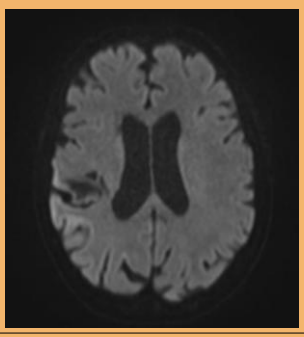
75-year-old woman with structural epilepsy, whose seizure recurrence was attributed to an underlying infection. This case illustrates how, in a diagnostically challenging and evolving context, EEG findings and clinical reasoning proved essential in driving the diagnostic process.

Materials and methods

Admitted to the ED with recurrent focal and subsequent focal to bilateral tonic-clonic seizures.
-Neurological examination: alert and cooperative, residual spastic left hemiparesis and distal clonic movements in the ipsilateral upper limb.
-EEG showed the onset of lateralized periodic discharges (LPDs) over the right hemisphere with spreading tendency.

Figure 1. Standard EEG. Lateralized periodic discharges (LPDs) over the right hemisphere with variable spreading tendency

-Brain CT was negative for acute lesions.
-Lab tests revealed inflammatory markers and UTI



-MRI was severely affected by motion artifacts and showed findings consistent with either inflammatory or postictal changes, complicating the diagnostic picture.

Figure 2. Cerebral MRI. Axial DWI. Right fronto-temporal-occipital subtle diffusion restriction

-Second EEG documented periodic polyspike-wave activity as for LPDs-max.
→ Favorable risk-benefit ratio, anticoagulation was suspended and a lumbar puncture performed.

Results

CSF positive for varicella-zoster virus (VZV) and intravenous acyclovir initiated. Serial EEG recordings documented a favorable evolution with reduced spread of LPDs by day two and their marked attenuation by day five.

Figure 3. Standard EEG. Periodic polyspike-wave activity with burst attenuation as in LPDs-max over the right hemisphere with spreading tendency

Discussion and conclusion

LPDs are traditionally considered negative prognostic markers in acute brain injury and have occasionally been reported in prior stroke. In this case, however, their dynamic evolution served as diagnostic biomarker, providing early guidance before definitive CSF confirmation and enabling timely targeted treatment.

This case exemplifies how temporally evolving EEG findings can provide decisive diagnostic insights in complex patients. The traditional interpretation of LPDs as nonspecific markers of poor outcome was overturned, revealing their diagnostic value when interpreted over time. In such contexts, clinical reasoning and bedside neurophysiology regain centrality in guiding care.

References:
1. Hirsch LJ, Fong MWK, Leitinger M, et al. American Clinical Neurophysiology Society's Standardized Critical Care EEG Terminology: 2021 Version. J Clin Neurophysiol. 2021 Jan 1;38(1):1-29
2. Gelisse P, Crespel A, Genton P, et al. Lateralized Periodic Discharges: Which patterns are interictal, ictal, or peri-ictal? Clin Neurophysiol. 2021 Jul;132(7):1593-1603.
3. Baykan B, Kinay D, Gökyigit A, et al. Periodic lateralized epileptiform discharges: association with seizures. Seizure. 2000;9(6):402–6.