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Using Simple CT Perfusion to Help Identify Ictal vs. Interictal Lateralized Periodic Discharges (LPDS): A Case Report

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Using CT perfusion to help identify ictal vs interictal lateralized periodic discharges (LPDs): A case report

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Introduction

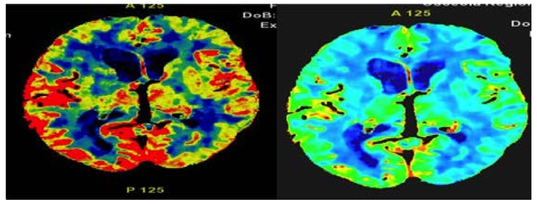
Lateralized Periodic Discharges (LPDs) are a readily identifiable pattern. Whether LPDs themselves should be considered an ictal pattern, remains a topic of ongoing controversy. It is well established that epileptic activity causes an increased metabolic demand in the involved cerebral cortex, which is accompanied by temporarily increased regional brain perfusion. Although ictal SPECT is a standard and reliable technique to assess brain perfusion changes, CT perfusion (CTP) is a faster imaging technique that also provides an active view of cerebral metabolic demand and perfusion. In our case, we found that CTP changes correlated with LPD abnormality on the EEG.

Case presentation

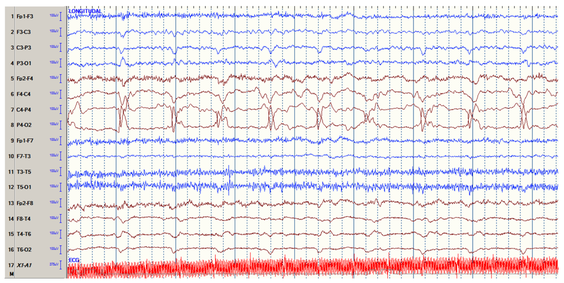
We report a case of a 70 year-old right handed woman with a past medical history of Pulmonary Embolism on apixaban and Diffuse Large B-Cell Lymphoma (DLBCL) on R-CHOP therapy who presented as a Stroke Alert for new onset left sided weakness. She was also found to have focal seizures involving rhythmic clonic movements of her left arm and face. persistent LPDs.

Work up and results

Initial CTP study revealed hyperperfusion of the right posterior operculum and parieto-temporal lobe demonstrate by decreased MTT, increased CBF, and CBV in those areas. Electroencephalogram (EEG) performed within 2 hour of the CTP studies showed lateralized, periodic discharges at 1-2 hertz seen over the right parietal area involving P4 electrode that, at times, were accompanied by focal seizures involving twitching of the left lower face. Her initial brain MRI showed restricted diffusion in the right insular region. Following adequate treatment with AEDs, her focal seizures resolved. Repeat CT perfusion was not performed, however, restricted diffusion changes disappeared in the follow-up MRI done 3 days later, while her EEG showed was still showing LPDs.



CT Perfusion at admission demonstrating increased cerebral blood flow (left) and blood volume (right) corresponding to an area of increased perfusion on the right posterior-operculum and parietal temporal lobe.



Electroencephalogram (EEG) performed within 2 hour of the CT perfusion study demonstrating lateralized, periodic discharges at 1-2 hertz seen over the right parietal area involving P4 electrode that, at times, were accompanied by focal seizures involving twitching of the left lower face.

Conclusion

Because of its broad availability and short processing time, CT perfusion may qualify as a fast and complimentary diagnostic tool to help differentiate between ictal and interictal LPD pattern. In those patients who present with EEGs showing LPDs that are of uncertain etiology, a positive CTP may help determine if the LPDs are closer to an ictal pattern. These patients may have had unrecognized seizures and CTP may help us determine if there is a need for a more aggressive AED therapy.

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