

## **A Histopathologic and Intraoperative Electrocorticography Analysis of 5 Consecutive Patients Undergoing Standard Temporal Lobectomy for Lesion-negative Temporal Lobe Epilepsy**

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### **Introduction:**

There are numerous studies published on surgery for temporal lobe epilepsy (TLE) with mesial temporal sclerosis (MTS), but little is understood about TLE without MTS. We analyze the histopathology and intraoperative epileptiform activity of patients who have TLE without MTS. Considering that a significant factor predicting outcome is lesional pathology, we assess whether temporal lobectomy has acceptable results in non-lesional pathology.

### **Methods:**

A prospective analysis of intraoperative depth electrocorticography (ECoG), histopathology, and seizure-freedom in 5 patients undergoing temporal lobectomy with amygdalohippocampectomy for medically-intractable TLE without MTS on 3T MRI was performed. Under direct visualization and stereotactic confirmation, intraoperative depth electrodes were implanted into amygdala, anterior, middle, and posterior hippocampus and ECoG sampled. The resected hippocampus was sent for histopathologic analysis.

### **Results:**

Mean follow-up was 3-6 months. 100% of patients achieved Engel Class I outcome. ECoG showed interictal spikes and seizure patterns, with activity mainly in one of three sectors with minimal propagation. Histopathologic analysis demonstrated no abnormalities of hippocampal structure, including no neuronal dropout or sclerosis, which is congruent with findings of negative pathology on MRI. Interestingly, there was focal cortical dysplasia Palmini type I in adjacent lateral cortex in all patients.

### **Conclusion:**

Temporal lobectomy in patients with TLE without MTS yielded excellent results. Given the finding of variable intraoperative ECoG and essentially normal hippocampal architecture, lesion-negative disease is likely a separate disease process from MTS. Finally, our finding of focal cortical dysplasia in all 5 patients suggests that selective amygdalohippocampectomy may not control intractable epilepsy in this specific population.