Postoperative EEG and seizure outcome in temporal lobe epilepsy surgery

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Abstract

Objective: To assess the prognostic value of scalp electroencephalogram (EEG) after epilepsy surgery, we investigated whether postoperative EEG abnormalities (interictal epileptiform discharges, IED; interictal slow activity, ISA) were associated with seizure outcome and other patient characteristics after resective surgery in patients with temporal lobe epilepsy (TLE).

Methods: Sixty-two patients with medically refractory TLE who underwent surgery were studied. Patients were categorized according to etiology (mesiotemporal sclerosis vs. tumors/cortical dysplasias); extent of surgical resection (extensive vs. limited); and amount of preoperative IED on wake EEG (oligospikers, ≤1 IED/h, vs. spikers). Patients were also classified as seizure-free (SF) or having persistent seizures/auras (not-SF) during follow up visits 1 month and 1 year after surgery. Preoperative 60-min interictal EEGs were evaluated for IED and ISA, and compared to postoperative wake EEGs.

Results: Seizures/auras persisted in 16/62 (25.8%) patients at 1 month and in 8/62 (12.9%) at 1 year follow up. ISA was not significantly related to outcome. Of 42 patients with EEG negative for IED at 1 month, 4 were not-SF; at 1 year, one of 44 such patients was not-SF. IED was significantly associated with seizure/aura persistence in patients categorized as mesiotemporal sclerosis and with extensive surgery. Oligospikers and spikers on preoperative EEG showed no differences in the postoperative seizure outcome, excellent in both cases; moreover, the presence of postoperative IEDs indicated auras/seizures persistence apart from the preoperative EEG spike frequency.

Conclusions: Our study showed that the presence of IED of postoperative EEG strongly indicates seizure/aura persistence. Therefore, serial EEGs should be included in postoperative follow up schedules as a crucial tool in evaluating seizure outcome.

Keywords: Temporal lobe epilepsy; Electroencephalogram; Epilepsy surgery; Outcome