

# Congruence and discrepancy of interictal and ictal EEG with MRI lesions in focal epilepsies

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### Abstract

**Objective:** To compare the occurrence and localization of interictal epileptiform discharges (IEDs) and epileptic seizure patterns (ESPs) with the localization of MRI lesions.

**Methods:** We retrospectively analyzed the EEG and MRI data of a series of patients with focal epilepsies that had been studied from 1991 to 2009.

**Results:** In patients with temporal lesions, the localization of IEDs was most congruent (58.6% with IEDs exclusively over the lesional lobe and 29.7% with a majority of temporal IEDs). This differed ( $p < 0.001$ ) from frontal lesions (27.5% with exclusively frontal IEDs, 24.6% with a majority of frontal IEDs). In parieto-occipital lobe lesions, only 12.1% had IEDs exclusively over the lesional lobe compared to 48.5% with no parieto-occipital IEDs at all. Patients with central lesions often lacked any IEDs (54.5%,  $p < 0.001$ ).

The occurrence and localization of ESPs also differed between the regions. They were most congruent in temporal lesions (63.5% of patient had ESPs only over the lesional lobe, 23.4% had the majority of ESPs over the lesional lobe), which differed from frontal and parieto-occipital lesions (37.7% and 30.3% of patients with ESPs only over the lesional lobe). Patients with central lesions had ESPs very frequently only outside the lesional lobe (63.6%). Surgery outcome did not differ between the regions.

**Conclusions:** The occurrence and localization of interictal and ictal EEG findings differs vastly for lesions in different brain regions. These findings should be used to carefully weigh the results from EEG studies particularly in patients with extratemporal epilepsies considered for epilepsy surgery.  
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### Keywords

**KeyWords Plus:** TEMPORAL-LOBE EPILEPSY; CLINICAL-MANIFESTATIONS; FALSE LATERALIZATION; SURGERY; PROPAGATION; LOCALIZATION; SEIZURES; ELECTRODES; LOBECTOMY; SELECTION

