Chronic Intracortical EEG Recordings in the Diagnosis and Treatment of 'Partial' Epilepsies

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Abstract

Experience has been gained with stereotactically implanted, bipolar electrodes and direct brain recordings for periods of up to 1 month in 50 patients with suspected psychomotor epilepsy and 10 patients with other forms of 'partial epilepsy' uncontrolled by medical treatment. Identification of the seizure foci had not been achieved by previous EEG, neurological, or radiological studies. Localization of a single seizure focus shown to initiate three or more spontaneous clinical seizures was possible in three fourths of this group and led to definitive surgical treatment. Placement of stereotactic electrodes varied according to the patient's symptoms, and the approaches were limited to regions involved with the pathological substrate. In psychomotor epilepsy these were confined to limbic system sites. In other 'partial' epilepsies several sites in suspected regions were utilized. These criteria will be further detailed. Methods included the stereotactic coordinates of Talairach et al., the Todd-Wells stereotactic apparatus, the hollow screw technique for chronically implanted electrodes, continuous radio-telemetry during varying states – waking, sleeping, during daily activities, during stimulations (photic, auditory, somatosensory, under influence of various drugs) and with videotape recordings of simultaneous behavior and EEG data. The interictal and ictal EEG correlates with various clinical patterns of the 'partial epilepsies' will be illustrated. Complications of the stereotactic procedure included one intracranial hematoma, two scalp infections requiring early removal of the electrodes and no instances of intracranial infection.

240

CRANDALL/WALTER/WALSH

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