

SURGERY

Clinical signs lateralizing temporal lobe seizure origin

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Objective: In order to scrutinize clinical signs that help lateralize the seizure origin, we reviewed the intracranial EEG/Videotelemetry of temporal lobe epilepsy (TLE) patients.

Methods: The clinical correlation of intracranial EEG with combined bilateral subdural and intracerebral electrodes was analyzed in 199 complex partial seizures (CPS) of consecutive 55 TLE patients who were then followed for more than 10 years postsurgically. The patients were examined neuropsychologically during and after the seizure. The seizure outcome was examined with the medical record or by filling questionnaire.

Results: There were 33 males and 22 females. The mean age of seizure onset was 12 years, age at surgery 26.7 years, and present age 41.6 years. The side of resection was on the left in 19 patients, right in 36 patients, non-dominant in 33 patients, and dominant in 22 patients. The pathology was mesial temporal sclerosis in 38 patients, dysembryoplastic neuroepithelial tumor in 11 patients, vascular in 4 patients, gliosis and normal in one patient each.

There were 39 patients with CPS originating from one side (unilateral TLE) and 16 patients with CPS arising from both sides independently (bilateral TLE). Elevated tonicities were more often observed in TLE with left side focus (Fisher test: $p < 0.05$), while hyperactive behavior or agitated behavior throughout the seizure was more often in TLE with right side ($p < 0.006$) or non-dominant focus ($p < 0.02$). Non-aversive head turning was ipsilateral in 14 of 15 patients, simple manual automatism was with contralateral hand in 10 of 15 patients, dystonia was contralateral in 23 of 28 patients, and postictal nose-wiping was with ipsilateral hand in 10 of 12 patients.

Ictal discharges spread to contralateral side (bilateral CPS) in 21 patients with unilateral TLE, remained in one hemisphere (unilateral CPS) in 11 patients with unilateral TLE, and the contralateral involvement was minimum in 7 patients with unilateral TLE, while all bilateral TLE had bilateral CPS ($p < 0.001$). Unilateral CPS was more frequent in TLE with seizure onset in non-dominant side ($p < 0.05$). Bilateral CPS showed more often elevated tonicities ($p < 0.002$) and staring ($p < 0.009$), while complex manual automatisms directed to the extra-body space/things ($p < 0.008$) and hyperactive behavior were more often in unilateral CPS ($p < 0.001$). All the patients who regained ability for naming or orientation within 60 sec after termination of seizure discharge had seizure origin in the non-dominant side. 34 patients with no seizure at all or only simple partial seizure in postsurgical years had more often unilateral TLE ($p < 0.001$), while 15 patients with CPS had more often bilateral TLE ($p < 0.02$).

Conclusions: There are ictal and postictal clinical signs suggesting of unilateral TLE or bilateral TLE, unilateral CPS or bilateral CPS, and dominant or non-dominant seizure onset. Hyperactive behavior, a sign suggestive of unilateral CPS, as opposed to elevated tonicities of bilateral CPS, was not reported previously. These may help lateralize seizure origin in presurgical evaluation.