

Non-lesional localization-related epilepsy

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Presurgical evaluation and the surgical treatment of non-lesional neocortical epilepsy is one of the most challenging areas in epilepsy practice. The resection of the epileptogenic lesion with the ictal onset zone is recognized as the most important factor for good surgical outcome. However, in the case of no structural lesion on MRI, the correct localization of the epileptogenic foci seems to be difficult. In addition to this problem, characteristics of neocortical epilepsy such as a widespread epileptogenic process, rapid propagation of the ictal rhythm, and the presence of eloquent areas also contribute to poor prognosis.

We evaluated the surgical outcome and the diagnostic role of ictal scalp EEG, interictal FDG-PET, and ictal ^{99m}Tc -HMPAO SPECT. In 41 non-lesional neocortical epilepsy patients (16 frontal lobe epilepsy, 11 neocortical temporal lobe epilepsy, 7 occipital lobe epilepsy, 4 parietal lobe epilepsy, and 3 with multifocal onset) who underwent surgical treatment between December 1994 and July 1998. Ictal scalp EEG had the highest diagnostic sensitivity in the localization of epileptogenic foci (69.7% vs. 42.9% for FDG-PET and 33.3% for ictal SPECT; $p=0.027$). However, no significant difference was found in the lateralization of the epileptogenic hemisphere

among the three modalities (78.8% for ictal scalp EEG, 57.2% for FDG-PET, and 55.5% for ictal SPECT; $p=0.102$). During a mean follow-up of 2.8 ± 1.1 years, 33 (80.5%) showed good surgical outcome (seizure free or seizure reduction $> 90\%$), including 16 (39.0%) seizure free patients.

In conclusion, Ictal scalp EEG was useful in the localization of epileptogenic foci. Interictal FDG-PET and ictal SPECT were found to be useful as complementary and sometimes as independent modalities. Many patients with non-lesional neocortical epilepsy would benefit from surgical treatment.¹⁻³

REFERENCES

1. Hong KS, Lee SK, Kim JY, Lee DS, Chung CK. Presurgical evaluation and surgical outcome of 41 patients with non-lesional neocortical epilepsy. *Seizure* 2002; 11: 184-92.
2. Cascino GD, Boon PAJM, Fish DR. Surgically remediable lesional syndrome. In: Engel J Jr, ed: *Surgical treatment of the epilepsies* (2nd Ed). New York: Raven Press, 1993: 77-86.
3. Zetner J, Hufnagel A, Ostertun B, et al. Surgical treatment of extratemporal epilepsy: Clinical, radiological, and histological findings in 60 patients. *Epilepsia* 1996; 37: 1072-80.