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Factors related to successful antiepileptic drug withdrawal after anterior temporal lobectomy for medial temporal lobe epilepsy

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Summary

Objective: To assess the rate of successful antiepileptic drug (AED) discontinuation, prognostic factors and proper time of AED withdrawal after surgery for medial temporal lobe epilepsy (MTLE).
Methods: We reviewed 171 consecutive patients who underwent resective surgery for MTLE. All patients were followed up for more than two postoperative years. AEDs were slowly tapered with an individualized schedule for each patient. Outcome status was determined from medical records and telephone interviews.
Results: 41.2% of patients experienced no seizure recurrence. 34.5% discontinued medication without seizure recurrence for more than 2 years at final assessment. Multivariate analysis revealed that an age greater than 30 years at surgery and postoperative AED reduction before 10 months increased the risk of recurrence [hazard ratio (HR) 2.1, 95% confidence interval (CI) 1.1—3.9 and HR 2.5, CI 1.1—5.8].
Conclusions: Resective surgery for MTLE brings seizure remission without AED to one-third of patients. Postoperative AED tapering is recommended after at least 10 months. Younger age at surgery is a good predictive factor of remission after MTLE surgery.

Introduction

Medial temporal lobe epilepsy (MTLE) is the most common form of partial epilepsy in adults, and

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anterior temporal lobectomy is the most frequently performed epilepsy surgery. Long-term seizure-free rates after anterior temporal lobectomy for MTLE range from 55 to 80%, according to definitions used and follow-up duration.[1–4] However, little information is available regarding antiepileptic drug (AED) withdrawal after successful surgery. Successful AED discontinuation rates have been reported to range from 10 to 45%,[4–7] with different AED withdrawal policies. In medically treated epilepsy patients, a minimum 2-year seizure-free period is generally recommended before AED withdrawal.[8] We attempt withdrawal earlier in children with an epileptic syndrome known to have a favorable prognosis. On the other hand, for surgically treated epilepsy patients, no guidance is available regarding required seizure-free times before AED withdrawal. Surgically treated patients may require shorter seizure-free intervals because the epileptogenic focus was removed. In the present study, we purposed to deduce the proper timing for AED withdrawal and to elucidate the effects of presurgical laboratory findings and clinical settings on AED withdrawal outcomes, in a homogeneous group of patients who received epilepsy surgery for MTLE.

Patients

We reviewed consecutive patients who were proven to have MTLE and received anterior temporal lobectomy, including amygdalohippocampectomy, between January 1994 and April 2002. MTLE was diagnosed; (1) when hippocampal sclerosis or another definite lesion was exclusively located inside the collateral sulcus, and (2) when an anterior temporal ictal onset was identified by video-EEG monitoring. Patients with neocortical lesions or bilateral hippocampal sclerosis were excluded. Patients with critical incongruent ictal semiology or ictal EEG findings were also excluded. One hundred seventy-one patients fulfilled the inclusion criteria, and all patients were followed up for more than 2 years postoperatively. Patients were identified from a computerized database containing information on all patients those underwent epilepsy surgery at Seoul National University Comprehensive Epilepsy Center.

Data collection and neurosurgery

Clinical parameters included age at nonfebrile-seizure onset and at surgery, duration of epilepsy, seizure frequency, number of AEDs, and history of febrile convulsion.

All patients received video-EEG monitoring, brain magnetic resonance imaging (MRI) including 3 mm sections perpendicular to the long axis of the hippocampus, F-18 fluorodeoxyglucose positron emission tomography (PET), ictal and interictal single photon emission computed tomography (SPECT), if possible, and the Wada test.

All patients with hippocampal sclerosis underwent anterior temporal lobectomy to an extent of 3.5 cm for the left and 4.5 cm for the right, with amygdalohippocampectomy. Some patients with other lesions received lesionectomy with hippocampectomy and anterior temporal lobectomy of variable extent.

Gross and microscopic tissue analyses were performed in all cases. Hippocampal sclerosis was defined as $>$50% neuronal loss in CA1.

Clinical parameters, presurgical evaluations, i.e., the presence of hippocampal sclerosis on MRI, contralateral spikes on EEG, and contralateral localization on SPECT or PET, were considered as potential prognostic factors.

Postoperative antiepileptic medication

The policy for postoperative antiepileptic medication was maintenance of preoperative medication for more than one month, and then AEDs were slowly tapered, with an individualized schedule for each patient. We included unscheduled arbitrary AED reductions in the analysis.

Postoperative follow-up and outcome classification

Data collected included seizure recurrence, time of recurrence, and AED medication details. Surgical outcomes for 1 year at the final assessment were graded using the Engel classification; class I was divided into seizure-free with AED and seizure-free without AED. The classification "seizure-free without AED" was defined as the absence of seizure for more than 2 years without medication. Seizure outcomes for the entire follow-up period were classified as: (1) seizure free, (2) aura only, (3) seizure recurrence, and (4) reoperation. The information was collected from hospital charts and outpatient medical records and was supplemented by telephone contact for the latest follow-up.

Statistical analyses

Data were analyzed using SPSS ver. 11.0. The χ^2 test was used for categorical variables. The influences of potential predictive factors on postoperative recurrence were evaluated by univariate and multivariate Cox regression analysis. Hazard ratios (HR) are presented with 95% confidence intervals (CI). Times