



ELSEVIER

journal homepage: www.elsevier.com/locate/epilepsyres



Seizure semiology identifies patients with bilateral temporal lobe epilepsy

Anna Mira Loesch, Berend Feddersen, F. Irsel Tezer¹,
Elisabeth Hartl, Jan Rémi, Christian Vollmar, Soheyl Noachtar*

Epilepsy Center, Dept. of Neurology, University of Munich, Marchioninstr. 15, 81377 Munich, Germany

Received 21 May 2014; received in revised form 14 October 2014; accepted 11 November 2014
Available online 22 November 2014

KEYWORDS

Temporal lobe epilepsy;
Bitemporal;
Semiology;
Lateralizing seizure phenomena;
Epilepsy surgery

Summary

Objective: Laterality in temporal lobe epilepsy is usually defined by EEG and imaging results. We investigated whether the analysis of seizure semiology including lateralizing seizure phenomena identifies bilateral independent temporal lobe seizure onset.

Methods: We investigated the seizure semiology in 17 patients in whom invasive EEG-video-monitoring documented bilateral temporal seizure onset. The results were compared to 20 left and 20 right consecutive temporal lobe epilepsy (TLE) patients who were seizure free after anterior temporal lobe resection. The seizure semiology was analyzed using the semiological seizure classification with particular emphasis on the sequence of seizure phenomena over time and lateralizing seizure phenomena. Statistical analysis included chi-square test or Fisher's exact test.

Results: Bitemporal lobe epilepsy patients had more frequently different seizure semiology (100% vs. 40%; $p < 0.001$) and significantly more often lateralizing seizure phenomena pointing to bilateral seizure onset compared to patients with unilateral TLE (67% vs. 11%; $p < 0.001$). The sensitivity of identical vs. different seizure semiology for the identification of bilateral TLE was high (100%) with a specificity of 60%. Lateralizing seizure phenomena had a low sensitivity (59%) but a high specificity (89%). The combination of lateralizing seizure phenomena and different seizure semiology showed a high specificity (94%) but a low sensitivity (59%).

Significance: The analysis of seizure semiology including lateralizing seizure phenomena adds important clinical information to identify patients with bilateral TLE.

© 2014 Elsevier B.V. All rights reserved.

* Corresponding author. Tel.: +49 89 7095 3691; fax: +49 89 7095 6691.

E-mail addresses: annamira.loesch@med.uni-muenchen.de (A.M. Loesch), berend.feddersen@med.uni-muenchen.de (B. Feddersen), irseltezer@yahoo.com.tr (F. Irsel Tezer), elisabeth.hartl@med.uni-muenchen.de (E. Hartl), jan.remi@med.uni-muenchen.de (J. Rémi), christian.vollmar@med.uni-muenchen.de (C. Vollmar), soheyl.noachtar@med.uni-muenchen.de, noa@med.uni-muenchen.de (S. Noachtar).

¹ Current address: Institute of Neurological Sciences and Psychiatry, Hacettepe University, School of Medicine, Ankara, Turkey.

Introduction

Anterior temporal lobectomy is an established treatment option for patients with medically refractory temporal lobe epilepsy (TLE) and superior to medical treatment alone (Wiebe et al., 2001). The prerequisite of resective temporal lobe epilepsy surgery is the exact lateralization of the epileptogenic zone since patients with bilateral TLE will not benefit from anterior temporal lobectomy (Noachtar and Rémi, 2009).

The evaluation of TLE patients considered for anterior lobectomy includes EEG-video monitoring, neuroimaging and neuropsychological tests (Noachtar and Borggraefe, 2009). The decision on unilateral versus bilateral temporal lobe seizure onset is usually based on results of EEG and imaging. However, invasive EEG investigation with subdural or depth electrodes may still identify unilateral seizure onset in selected TLE patients, in whom non-invasive evaluation showed bilateral interictal and ictal results (So et al., 1989). The improvement of MRI technology and the introduction of PET and ictal SPECT reduced the number of invasive evaluations since bilateral abnormalities will likely exclude the patients from further invasive evaluations and the associated risks.

The initial seizure symptoms provide information on the localization and lateralization of the seizure-onset zone (Ebner et al., 1995; Henkel et al., 2002; Noachtar, 2001; O'Dwyer et al., 2007; Wyllie et al., 1986). We investigated whether the analysis of seizure semiology identifies patients with independent bilateral temporal lobe seizure onset who will not be candidates for resective epilepsy surgery.

Material and methods

We reviewed our EMU data base and included those 17 consecutive epilepsy patients who demonstrated bilateral independent seizure onset in invasive evaluations (Table 1). The first consecutive 40 patients of our database with left or right TLE, who were seizure free after anterior temporal lobe resection served as a control group. All patients had medically refractory TLE and underwent a standardized non-invasive presurgical evaluation (Noachtar and Borggraefe, 2009).

The lateralization of a given seizure was based on the ictal invasive EEG seizure pattern. Continuous EEG-video monitoring was first recorded with non-invasive and sphenoidal electrodes (Vangard, Cleveland/Ohio; XLTEK, London, Ontario/Canada). The additional invasive evaluations included subdural or stereotactically implanted depth electrodes in all 17 patients with bilateral temporal lobe seizure onset.

The seizures videos were evaluated independently by two experienced epileptologists (BF and IT) who were blinded to the patient data. The seizure semiology was analyzed based on the semiological seizure classification (Lüders et al., 1998). Different seizure evolutions meant that the semiology was different between seizures which arose from left and right temporal lobes in a given patient. Patients who only had auras were not included in this study since auras do not show any objective and observable signs or symptoms.

An example of patient 4 illustrates the approach to define identical or different seizure semiology:

- (1) dialeptic seizure → left versive seizure → generalized tonic clonic seizure,
- (2) abdominal aura → complex motor seizure.

These two seizures were classified as different seizure semiologies.

The sensitivity and specificity of the combination of identical vs different seizure semiology, unilateral versus bilateral lateralizing seizure phenomena were calculated for unilateral and bilateral TLE.

χ^2 analysis or Fisher's exact test was used to evaluate the significance of the relationship of seizure semiology and lateralizing seizure phenomena in patients with bitemporal and unilateral TLE. Significance was assumed at $p < 0.05$.

Results

A total of 407 seizures were evaluated in 17 patients with bilateral TLE, 20 patients with right TLE and 20 patients with left TLE. Different seizure semiology occurred in all 17 patients (100%) with independent bilateral temporal seizure onset and in 16 of 40 patients (40%) with unilateral temporal lobe seizure onset ($p < 0.001$).

Looking at the 53 patients in whom lateralizing seizure phenomena were recorded, 10 of 17 patients with bilateral TLE (67%) had lateralizing signs from both hemispheres compared with four of 36 patients (11%) with unilateral TLE ($p < 0.001$).

The specificity in identifying bilateral TLE was excellent with the combination of different seizure semiology and bilateral lateralizing seizure phenomena. This combination was present in 10 of 17 patients with bitemporal seizure onset and in two of 34 patients with unitemporal seizure onset. The specificity of identifying bilateral TLE with these semiological features was high (94%) but the sensitivity was poor (59%).

In 13 patients of the 17 patients (76%) with invasively proven bilateral TLE, MRI was either negative ($n = 10$) or showed bilateral abnormalities ($n = 3$). All patients with unilateral TLE showed a unilateral pathology in the MRI. The sensitivity was 41% (specificity 0%). Seizure semiology in all these 13 patients was different between left and right temporal EEG seizure onset, whereas 24 of the 40 patients with unilateral TLE showed an identical seizure semiology (sensitivity and specificity 100%). All 6 patients with no pathology or a bilateral pathology in the MRI who showed bilateral lateralizing phenomena belonged to the group of the invasively proven bilateral TLE. Just as all patients with an unilateral pathology in the MRI combined with an identical semiology were diagnosed as unilateral TLE (sensitivity and specificity 100%).

Discussion

This study shows that the analysis of seizure semiology including lateralizing seizure phenomena identifies patients with bitemporal independent seizure onset. This information is important for patients considered for resective

Download English Version:

<https://daneshyari.com/en/article/6015657>

Download Persian Version:

<https://daneshyari.com/article/6015657>

[Daneshyari.com](https://daneshyari.com)