



## Case Report

## Right and left mesial temporal lobe seizures in one patient: Bona fide semiological, interictal, ictal, and MRI evidence

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## ABSTRACT

We present the case of a 36-year-old patient with bilateral independent manual automatisms associated with seizures coming independently from the left and right temporal lobes, as documented by surface EEG ictal recordings. An MRI showed evidence of bilateral mesial temporal sclerosis, more prominent on the right side. We speculate whether clinical semiology (along with the ictal EEG and imaging findings) discourages the pursuit of invasive monitoring, leading to more aggressive medical management in this particular case.

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### 1. Clinical history

This is the case of a 36-year-old female diagnosed with clinically intractable epilepsy and referred to a tertiary epilepsy center for surgical evaluation and treatment. She has a history of a single (untreated) convulsion at 2 years of age. There is no reference to seizure recurrence until her first pregnancy at age 18, when she developed seizures characterized by prolonged staring and unresponsiveness followed by tonic-clonic generalization. Seizure recovery was accompanied by marked confusion and physical aggression. During the course of her epilepsy she was admitted twice with the diagnosis of status epilepticus, both episodes controlled after iv phenytoin loads. Despite adequate trials of phenobarbital, carbamazepine, valproic acid, and lamotrigine she continued to have frequent seizures, averaging three to four complex partial seizures per week, with rare secondary generalization. An outpatient MRI suggested right hippocampal atrophy.

### 2. Admission data

She was admitted for Phase I (noninvasive) surgical protocol. For video-EEG monitoring AEDs were tapered on day 1 and discontinued on day 2. EEG showed bilateral temporal independent interictal spikes, similarly present on both hemispheres, with phase reversals on F7 and F8 electrodes (Fig. 1). On day 2 she had an episode, described by relatives as “typical,” including unresponsive-

ness, staring, and right-hand automatisms seen shortly after seizure onset. The ictal electrographic correlate to this seizure showed right temporal rhythmic theta activity, maximal at the F8 electrode (Fig. 2). There was no secondary generalization. On day 3 she had a second episode, equally characterized by unresponsiveness and staring, but this time left-hand automatisms were seen at the seizure onset. Ictal EEG showed left temporal rhythmic theta activity, maximal at F7/T3 electrodes (Fig. 3). On the basis of these data the MRI was repeated and this time showed evidence of bilateral hippocampal atrophy, yet more prominently seen on the right side (Fig. 4). Neuropsychological evaluation suggested both verbal and visual memory impairment. AEDs were resumed and doses adjusted. A surgical option was not feasible at this point. The possibility of invasive monitoring (more likely, foramen ovale electrodes) and eventual surgical treatment based on the new data to be acquired were discussed with the family.

### 3. Discussion

Even considering the existence of different protocols, unilateral mesial temporal sclerosis is generally associated with both straightforward presurgical evaluation data and excellent surgical outcome in up to 80% of patients [1,2]. A growing body of evidence has suggested that, even in apparent unilateral temporal lobe epilepsy associated with mesial temporal sclerosis, damage may involve both hippocampi or spread farther to extratemporal structures, as demonstrated by both imaging and pathology data [3]. These patients usually present with incongruent lateralization data based on noninvasive techniques. Some are subjected to Phase

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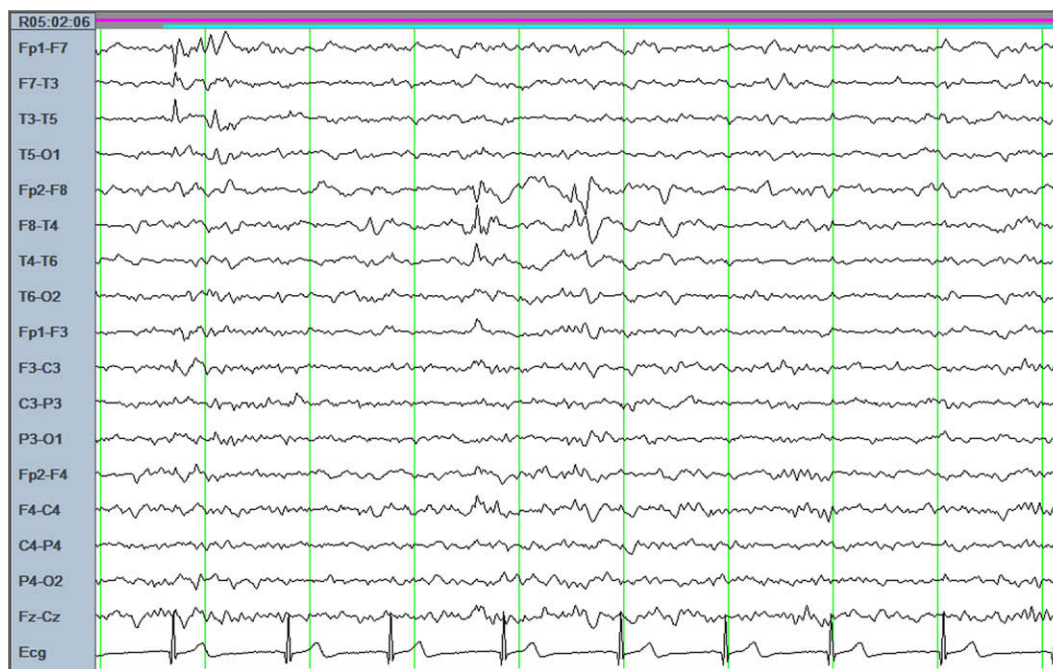


Fig. 1. Interictal EEG showing bilateral independent spikes.

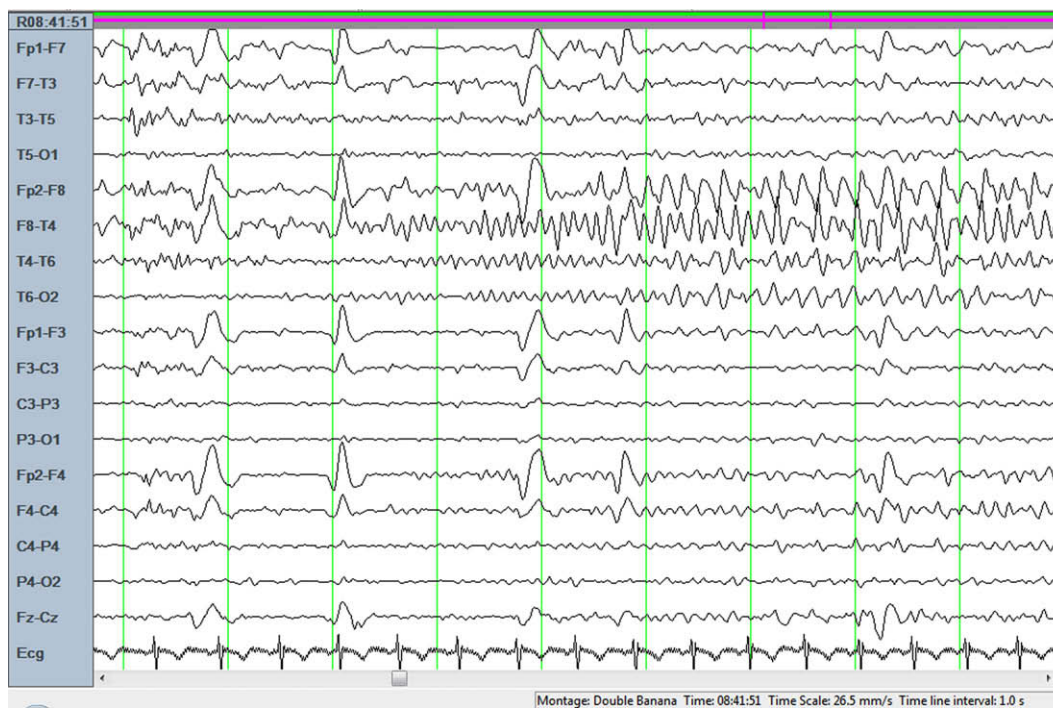


Fig. 2. Ictal EEG showing right temporal onset.

II (invasive) protocols that may or may not lead to surgical indications, while others have their surgical option bluntly denied. Results on surgical outcome for these specific subgroups (i.e., patients in which there is clear evidence of bilateral mesial temporal involvement) are disputed, varying from fair to optimistic.

We present a case in which there is evidence for the existence of bilateral independent temporal epileptogenic zones, as documented by bilateral interictal temporal spikes, bilateral temporal lobe seizures on surface EEG, bilateral hippocampal atrophy, and bilateral (verbal and nonverbal) memory deficits. Perhaps of utmost relevance with respect to our data was the

recording of different seizure semiology associated with left and right seizure onsets, based on the classic feature of unilateral automatisms.

Automatisms are reportedly ipsilateral to the seizure focus in up to 80% of recorded seizures [4]. Furthermore, there is reasonable evidence that coincidental ictal surface EEG and semiological lateralization improve accuracy on the localization of the epileptic focus [5]. In our patient, ictal surface EEG and semiology coincide perfectly with seizures coming independently from the right and left temporal lobes, corroborating the hypothesis of independent (and active) epileptic foci. In addition, MRI provides structural sub-

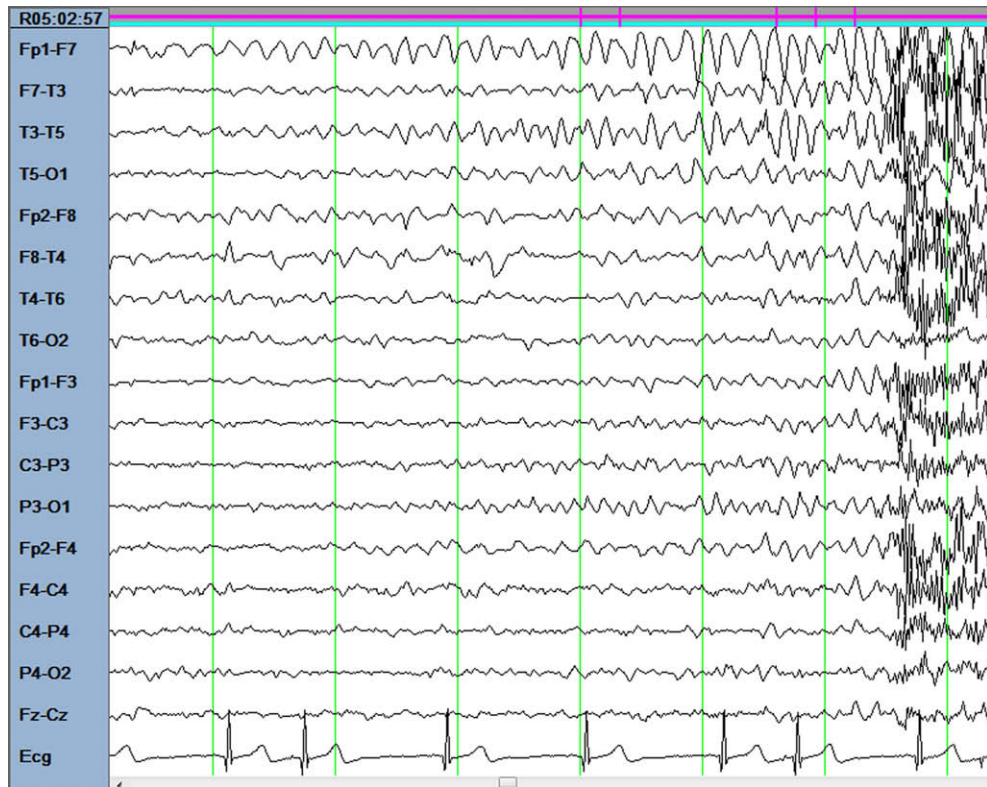


Fig. 3. Ictal EEG showing left temporal onset.

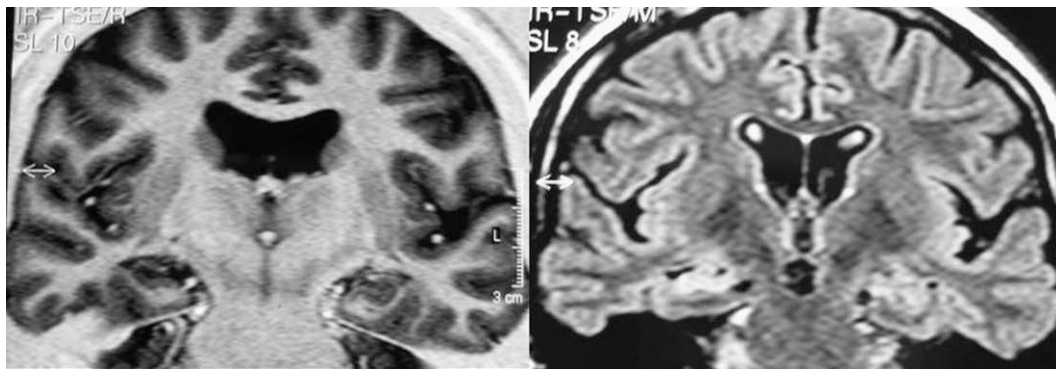


Fig. 4. MRI showing bilateral mesial temporal atrophy.

strate for both right and left seizure onsets. In the present case these findings postponed the invasive evaluation and led to the pursuit of more aggressive clinical management.

A potential caveat to this observation, however, comes from the recent study that reveals somewhat new and surprising data on unilateral hand automatisms in temporal lobe epilepsy [6]. That study analyzed 310 seizures and found high lateralizing value (85%) in unilateral automatisms (being ipsilateral to the epileptic focus) associated with contralateral hand dystonia. When the dystonic feature was absent that value dropped to 63%. Interestingly enough, left unilateral automatisms without dystonia had a high lateralizing value (ipsilateral in 82% of the patients), while right unilateral automatisms without dystonia had almost no lateralizing value. The authors speculated that handedness may be associated with the different lateralizing value of left versus right unilateral hand automatisms.

#### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.yebeh.2008.08.022.

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