

Occipital Intermittent Rhythmic Delta Activity (OIRDA) and Occipital Seizures in an Elderly Patient

Yaşlı Bir Olguda Oksipital Nöbetler ve Oksipital İntermittent Ritmik Delta Aktivitesi (OİRDA)

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Summary

Occipital intermittent rhythmic delta activity (OIRDA) is considered as an electroencephalography (EEG) pattern which is usually seen in children but does not always have pathological significance. The physical examination of a 70-year-old patient who was admitted with complaints of hallucination, headache and falling episodes, revealed just a deficiency of vigilance and concentration. Magnetic resonance imaging of the patient revealed generalized chronic ischemic changes, cerebral atrophy and leukoaraiosis especially prominent in the posterior regions. There was OIRDA presence in the occipital regions in routine EEG examination. Since the patient's symptoms continued despite phenytoin, oxcarbamazepine and topiramate, we replaced topiramate with levetiracetam. Patient's visual illusions and falling episodes diminished following treatment, and also OIRDA highly disappeared in the EEG.

Key words: Epilepsy; migraine; occipital intermittent rhythmic delta activity.

Özet

Oksipital intermitten ritmik delta aktivitesi (OİRDA), daha çok çocuklarda görülen ve her zaman patolojik anlamı olmayan bir elektroensefalografi (EEG) patterni olarak kabul edilir. Halüsinasyon, baş ağrısı ve düşme atakları ile başvuran 70 yaşında erkek hastanın muayenesinde dalgınlık ve konsantrasyon kaybı vardı. Kranial manyetik rezonans görüntüleme yaygın kronik iskemik değişiklikler, serebral atrofi ve özellikle posterior bölgelerde lökoriazis görüldü. Rutin EEG'de oksipital bölgelerde OİRDA vardı. Fenitoin, okskarbazepin ve topiramate ile hastanın şikayetlerinin devam etmesi üzerine topiramate kesilerek levetirasetam eklendi. Tedavi sonrası hastanın halüsinasyonları ve düşme atakları azaldı, EEG'de ise OİRDA büyük ölçüde kayboldu.

Anahtar sözcükler: Epilepsi; migren; oksipital intermitten ritmik delta aktivitesi.

Introduction

Occipital intermittent rhythmic delta activity (OIRDA) is described as an intermittent, sawtooth shaped, unilateral or bilateral, symmetrical, medium or high amplitude, paroxysmal and regular delta frequency activity occurring in the oc-

cipital region during electroencephalography (EEG) monitoring. It increases with hyperventilation and decreases with eye opening and sleep.^[1,3] Though OIRDA is suggested to be an interictal EEG finding that is mostly specific to children, it may not always be associated with epilepsy.^[2]

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In this report, we present a case of an elderly patient with occipital lobe epilepsy that shows intermittent rhythmic delta activity in the occipital regions.

Case Report

A 70-year-old male was admitted to our clinic with complaints of colorful bright lights, headache and falling episodes. His medical history revealed that his complaints were present for 6 months. He was having a wide variety of complex hallucinations such as moving shadows during daytime, colorful lights, red walls and bypassing cars. He also described headaches and loss of interest to environment. He was also reported to have 10-15 second-lasting episodes associated with loss of consciousness, falling down and tonic contractions 2-3 times, daily. He slept post-ictally and had no recall of the seizures.

Physical examination of the patient revealed no significant findings other than a deficiency of vigilance and concentration. His blood pressure was 150/100 mmHg and blood glucose level was 174 mg/dl. He was on antihypertensive and oral antidiabetic medication. In his neuropsychiatric evaluation, his mini mental test score was within normal limits. Magnetic resonance imaging (MRI) showed 'multiple microangiopathic ischemic foci in cerebral white matter bilater-

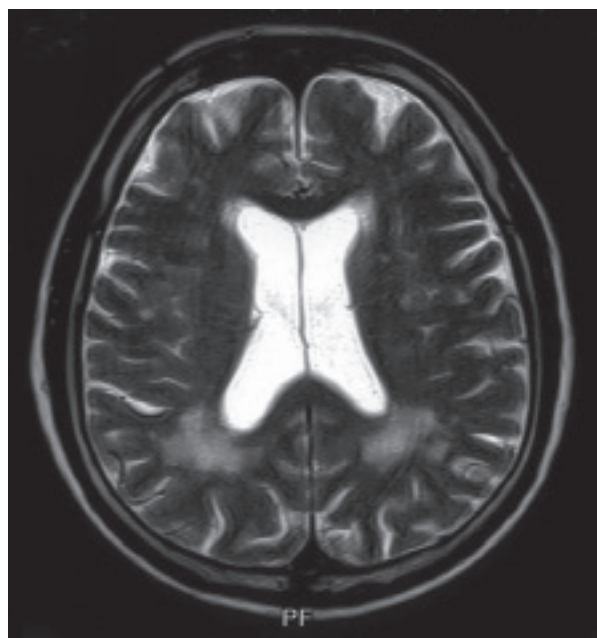


Figure 1. T2 axial section: minimal dilatation of ventricles, cerebral atrophy and posterior leukoaraiosis in MRI.

ally, minimal dilatation of third and lateral ventricles' that was considered to be secondary to cerebral atrophy, and 'leukoaraiosis especially prominent in the posterior regions' (Figure 1). Routine EEG examination showed quasi-continuous, bilateral and synchronous long lasting rhythmic, 3-3,5 Hz delta activity with moderate amplitude and occipital localization. This activity was considered as OIRDA and it ameliorated with eye-opening (Figure 2). The patient was inattentive during the EEG and described visual illusions. The picture suggested a non-convulsive status epilepticus with additional tonic seizures. In order to support or reject this hypothesis IV diazepam (10 mg/IV) was administered during the EEG recording. It resulted with a partial reduction in OIRDA; thus, the procedure was without much benefit for a sound interpretation (Figure 3).

Phenytoin up to 400 mg/day was ineffective for the visual seizures and the tonic falling seizures. Oxcarbazepine (600 mg/day) followed by topiramate (200 mg/day) were tried later with no apparent significant improvement in either the clinical or the EEG findings. Upon lack of significant improvement under triple antiepileptic treatment, topiramate was replaced with levetiracetam (1000 mg/day) which resulted with a decrease in the number of the falling seizures and periods of headache. Visual illusions became less frequent and limited to the left eye-field. They were visualized as moving human shadows and disappeared when gazed towards them carefully. During video EEG recording, slow waves were noted to disappear while the eyes were open much less activated by eye closure (Figure 4). All seizures subsided during the later years and, the patient is on oxcarbazepine (600 mg/day) and levetiracetam (1000 mg/day) treatment presently. He is being followed-up for six years without any more complaints.

Discussion

Occipital slow waves in the EEG with intermittent and rhythmic characteristics, are more common in children, and may be a sign of epilepsy or have no pathological significance at all.^[2-4] Although these waves are suggested to be the childhood form of frontal intermittent rhythmic delta activity (FIRDA) which is seen in adults, regarding the clinical correlation they rather resemble temporal intermittent rhythmic delta activity (TIRDA).^[2,3] While TIRDA is frequently seen together with temporal lobe epilepsy, FIRDA is reported to be closely associated with acute encephalopathy.^[5,6] Patients with OIRDA may have, in decreasing frequency, generalized

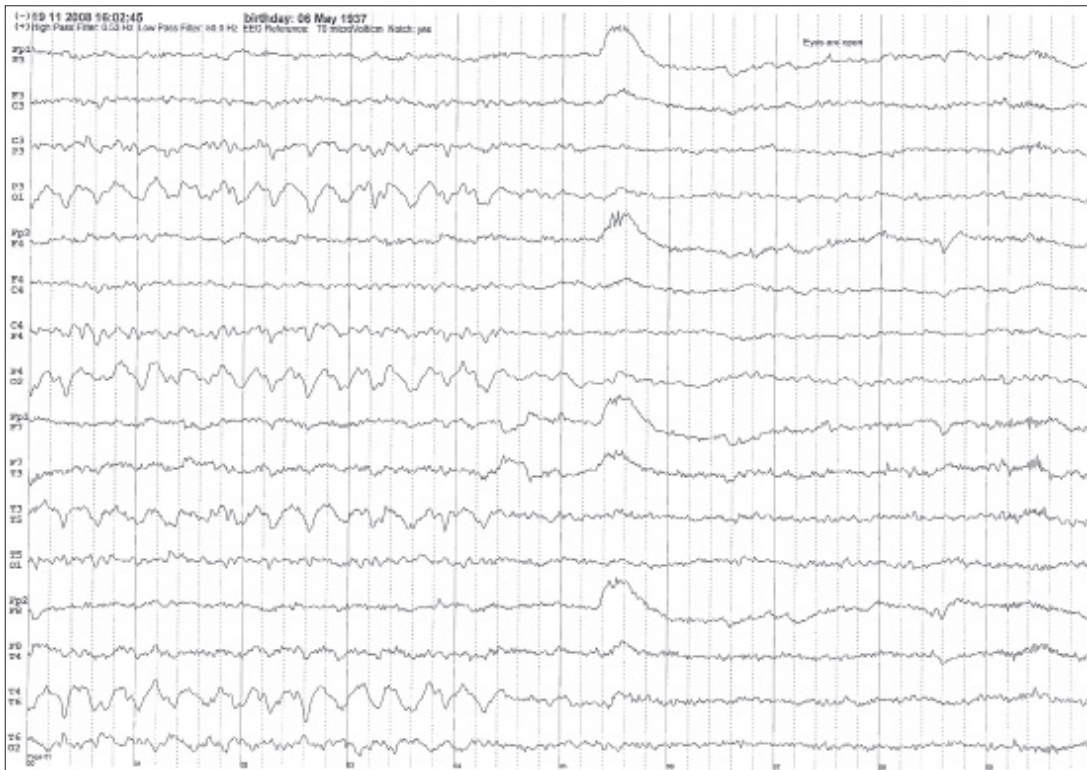


Figure 2. Rhythmic delta activity in routine EEG.

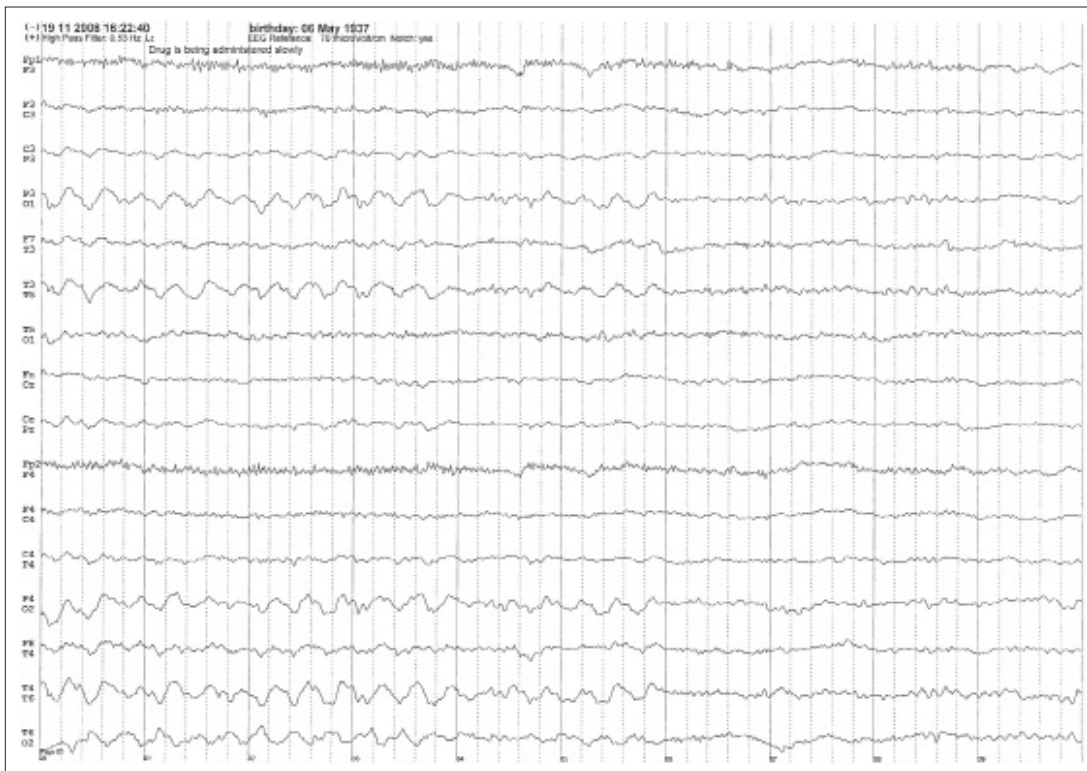


Figure 3. Decrease in rhythmic delta activity following intravenous diazepam administration in routine EEG.

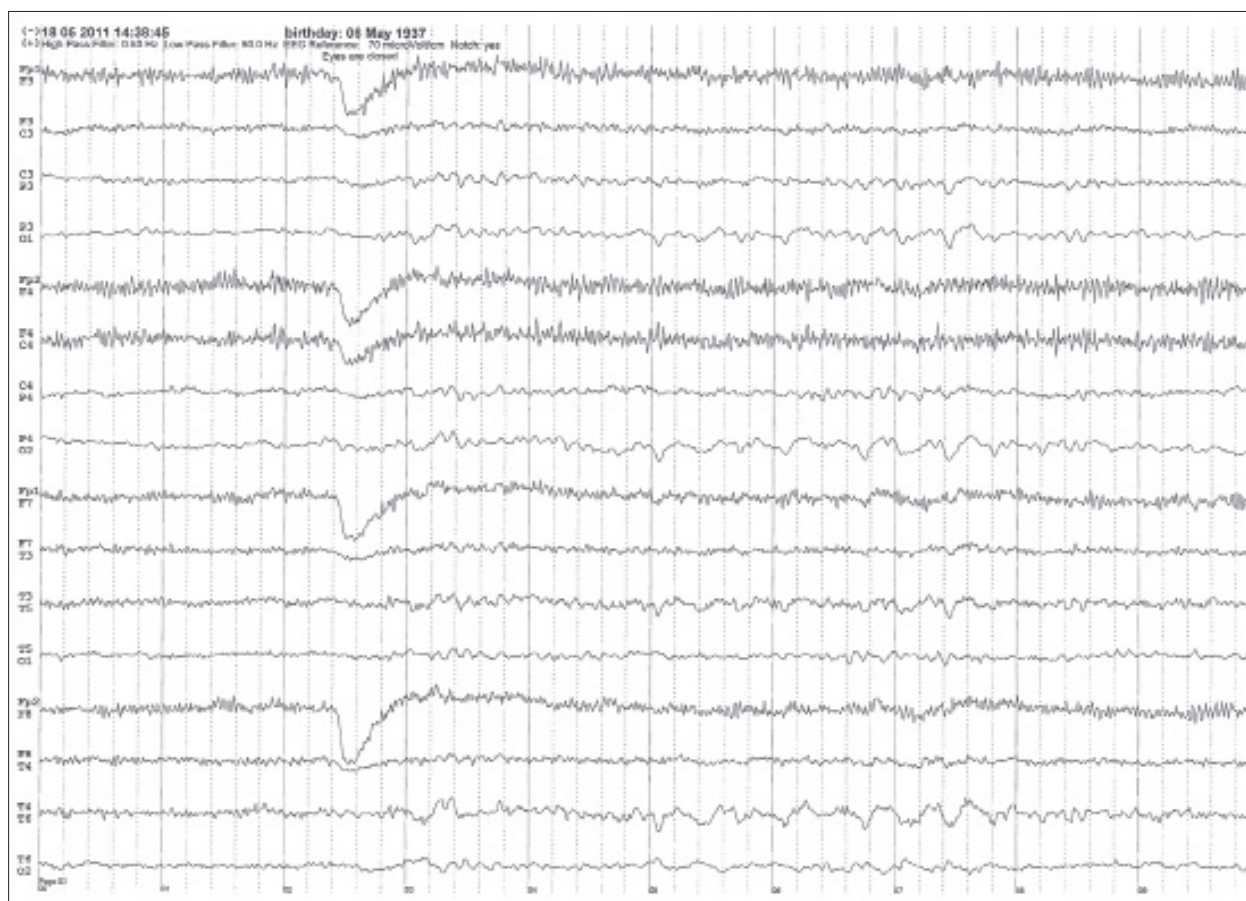


Figure 4. EEG findings after treatment.

tonic-clonic seizures, partial and absence seizures, atonic, tonic and myoclonic seizures. In a limited number of studies that included childhood cases in recent years, it is suggested that OIRDA is an interictal EEG finding, which is mostly specific to children.^[2,3,7] Another EEG finding localized to posterior regions is Pi rhythm which was used by Silbert et al. to identify a form of occipital slow waves which does not have any significance regarding epilepsy. Pi rhythm is a series of short, monomorphic occipital slow waves that is seen only in children and adolescents and occur in the first 2 seconds following eye closure.^[4] In our patient, occipital rhythmic waves have occurred either at the same time with or within various intervals following eye closure which ruled out Pi rhythm.

In a comprehensive study on OIRDA by Gullapalli et al. presence of seizures in 69 of 77 patients are reported to be significant when compared to control group. Those were usually presented with generalized convulsions, partial and absence

seizures. Apart from a 22-year old young adult, all remaining patients were in childhood age.^[3] In another study, Desai et al. studied 31 cases and found that absence seizures were more frequently seen in patients with OIRDA.^[8]

In our patient, the main clinical picture consisted of periods of frequent and serious visual hallucinations and severe headache. Visual hallucinations may be major symptoms of occipital lobe epilepsy as well as migraine aura.^[9,10] Visual hallucinations of migraine aura have linear patterns of colorless, black and white sawtooth shapes, whereas, simple visual symptoms in occipital epilepsies have multi-colored, circular or spherical patterns. Those symptoms suggest a pathology in the primary visual cortex located in and around the calcarine fissure. Complex visual hallucinations, which involve moving figures resembling human or animal forms, are seen less frequently as compared to simple ones and suggest a temporooccipital involvement.^[11-13] It is also reported that severe headache is a frequent

symptom in occipital lobe epilepsies.^[14] Visual hallucinations were in the form of both simple and complex visual symptoms in our patient. Hallucinations seen in occipital lobe epilepsies do not last longer than 1-4 minutes, whereas, hallucinations of migraine aura may last as long as 20-150 minutes. Status epilepticus in this case, characterized mainly by visual seizures is differentiated from migraine status by history, presence of tonic seizures and detailed characteristics of visual images. However, it is not easy to accept the present case as a reliable model for status epilepticus with occipital seizures, since no epileptogenic complexes, associating the clinical visual episodes were present in the EEG.^[15] In nonconvulsive status epilepticus, continuous atypical spike-and-wave, polyspike-and-wave and rarely rhythmic bilateral 3Hz spike-and-wave complexes are commonly expected.^[16] Although, 'atypical' spike-and-wave activity may necessarily not always contain well-formed spikes or sharp-waves during a non-convulsive status epilepticus, OIRDA in the EEG associating visual illusions and headache episodes seems to provide a more cautious interpretation for this neurological condition with such unique features.

In conclusion, we intended to draw attention to the presence of OIRDA in an elderly patient with occipital lobe epilepsy, although this finding is reported to be more common in childhood.

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