



# Epilepsia Partialis Continua in a Patient with Progressive Multiple Sclerosis

## *Progresif Multipl Sklerozlu Hastada Epilepsiya Parsiyalis Kontinua*

© Gökhan Görken<sup>1</sup>, © Abdullah Yılıgör<sup>2</sup>

<sup>1</sup>Mus Bulanik State Hospital, Clinic of Neurology, Mus, Turkey

<sup>2</sup>Van Yuzuncu Yil University Faculty of Medicine, Department of Neurology, Van, Turkey

### Abstract

Multiple sclerosis (MS) is a chronic autoimmune neurologic disease with demyelination. Epileptic seizures can be seen during episodes or out of the episodes in the course of MS. Although epileptic seizures are rare in patients with MS, they are more common than the normal population. We present a patient with MS who presented with epilepsia partialis continua, which could not be stopped with antiepileptics in the classic status epilepticus protocol but was limited with pulse steroid therapy.

**Keywords:** MS, EPC, epilepsia partialis continua, steroid, epilepsy, partialis, spell, multiple sclerosis

### Öz

Multipl skleroz (MS), demiyelinizasyon ile seyreden, otoimmün, kronik nörolojik bir hastalıktır. MS hastalığının seyrinde atak ya da atak dışı dönemlerde epileptik nöbetler görülebilmektedir. Epileptik nöbetler MS'li hastalarda seyrek görülse de normal popülasyona göre fazladır. Biz klasik status epilepticus protokolündeki anti-epileptiklerle durdurulamayan ancak pulse steroid tedavisiyle sınırlandırılabilen epilepsiya parsiyalis kontinua ile prezente olan bir MS'li hastamızı sunuyoruz.

**Anahtar Kelimeler:** MS, EPC, epilepsia parsiyalis kontinua, steroid, epilepsi, parsiyalis, nöbet, multipl skleroz

### Introduction

The incidence of epileptic seizures in multiple sclerosis (MS) patients is higher than the normal population. These seizures, which are seen during or outside an attack, may present as generalized and focal seizures. In MS patients, seizures, which can sometimes be limited by the initial status epilepticus treatment, can sometimes be presented with advanced status therapies. In this case report, we present an MS patient whose seizure presented as epilepsia partialis continua and limited to pulse steroid therapy.

### Case Report

A 28-year-old female patient, who had been followed up for 12 years for MS, was still being followed up with a diagnosis of progressive MS, presented to our emergency department with symptoms of change in consciousness and jerks on the left side of her face for two days. The general condition of the patient,

who was already bedridden, was poor due to the decrease in oral intake. She was somnolent, he could move her four extremities minimally, her deep tendon reflexes were globally hyperactive, and contractions were present in the left side of her face. Except for diffuse demyelinating plaques, no active contrast enhancement was observed in magnetic resonance imaging (MRI) (Figure 1). The patient, whose temperature was found to be normal in the emergency department, and in whom no significant pathology was found in the cerebrospinal fluid examination and routine blood tests, was admitted to our intensive care unit (ICU).

During the video electroencephalogram (EEG) monitorization, intravenous (IV) diazepam at a dose of 10 mg was administered to the patient who had epileptiform discharges characterized by spikes and sharp waves in almost all of the recording in the right hemisphere. Although the frequency of paroxysmal epileptiform discharges and jerks on the left side of her face decreased partially,

**Address for Correspondence/Yazışma Adresi:** Gökhan Görken MD, Mus Bulanik State Hospital, Clinic of Neurology, Mus, Turkey  
Phone: +90 534 857 92 55 E-mail: doktorazad@gmail.com ORCID: orcid.org/0000-0001-9197-8298

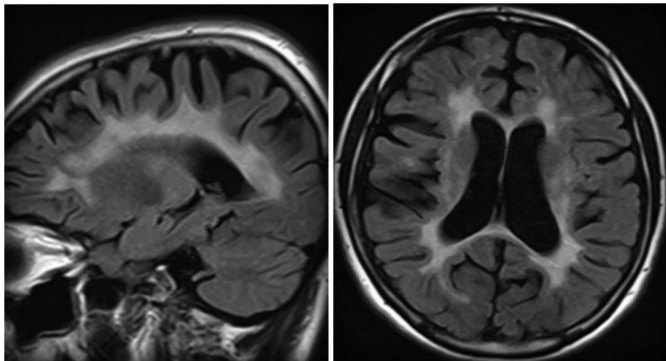
**Received/Geliş Tarihi/ 30.11.2019 Accepted/Kabul Tarih:** 01.11.2020

©Telif Hakkı 2021 Türk Nöroloji Derneği  
Türk Nöroloji Dergisi, Galenos Yayınevi tarafından basılmıştır.

they recurred later. In our ICU, 1.500 mg IV phenytoin and 2.200 mg IV valproic acid (VPA) were loaded, respectively, and the frequency of jerks on her face continued, although their frequency decreased. It was observed that the activity, characterized by spike-sharp waves, continued in the right hemisphere of the patient, who underwent video EEG monitoring again (Figure 2). It could not be decided whether the patient's seizure was related to an MS attack, it was thought that there was a seizure due to immune mechanisms, and IV 1.000 mg pulse steroid therapy was initiated. EEG examination performed 12 hours after the first dose showed a decrease in the frequency and amplitude of epileptiform activity, which was characterized by repetitive spike-sharp waves. The patient, whose jerks on her face significantly decreased, was followed up in the ICU without being intubated. The seizures of the patient ceased completely on the 3<sup>rd</sup> day of the pulse steroid therapy and the rhythmic paroxysms in her EEG disappeared. Later, levetiracetam (LEV) was added to the treatment and the seizures did not recur.

## Discussion

It has been reported that the incidence of epileptic seizures increases in patients with MS (1,2), which increases mortality (3,4,5,6,7). Although its pathogenesis has not been clarified, it is thought that hypersynchronization in the brain caused by cortical and subcortical lesions causes seizures in patients, and the mechanism by which these lesions become epileptogenic is



**Figure 1.** Diffuse demyelinating plaques without contrast enhancement are seen in the patient's brain MRI-T2 sequences



**Figure 2.** Despite antiepileptic drugs, epileptiform discharges characterized by spikes and sharp waves observed in almost all of the electroencephalogram recording in the right hemisphere

unknown (7,8,9). Although it is thought that epileptic seizures are mostly seen during an attack, they can occur at any time other than an attack, as in our patient (10).

In epileptic seizures, especially in refractory status epilepticus due to autoimmune etiologies, and in epileptic seizures where immunity and inflammation are thought to play a role, it has been observed that antiepileptic drugs are not effective and immune therapy is successful (11). Steroids, IV immunoglobulin, plasmapheresis, and azathioprine are used in immune therapy in these patients, and recently cyclophosphamide and monoclonal antibodies such as rituximab, efalizumab, and natalizumab have been reported to be used (11). Epileptic seizures can occur with all kinds of systemic autoimmune diseases. It is thought that the pathogenesis of these seizures may involve direct central nervous system involvement, a decrease in the seizure threshold or antineuronal antibodies (12).

There is an ongoing debate about the prognosis of seizures in MS and whether anticonvulsive therapy should be initiated after a single seizure. Typically, in patients without additional neurologic comorbidity, anticonvulsive therapy may not be initiated after a single seizure if EEG and MRI do not demonstrate high evidence of seizure recurrence risk (13,14). It is thought that the first seizure in patients with MS should be considered as an acute symptomatic seizure, as in other brain pathologies, and we should be more selective in starting medication (15). However, it is stated that seizure relapse is frequent in patients with MS presenting with status epilepticus and anticonvulsive therapy is recommended (14).

Some studies have reported that patients with progressive MS have a higher risk of seizure recurrence (16,17). There are also studies showing that the risk of epileptic seizures increases with disease progression (18,19). In general, seizures in patients with progressive MS are thought to be resistant to treatment, and it is thought that seizures provoked during an attack are easy to control (10). Anti-epileptic prophylaxis treatment is required in patients after focal or generalized status epilepticus. Low doses of VPA, LEV, and other new antiepileptic drugs may be preferred because they have little effect on motor or cognitive functions (13).

As a result, all kinds of seizures can be observed in patients with MS, and even MS can present with seizures first. It should be kept in mind that these seizures may be seen during an attack and autoimmune epileptic seizures not related to attack may also occur. Although *epilepsia partialis continua* is rarely seen in patients with MS, it is resistant to antiepileptic treatments as in our patient, and it can give a dramatic response to pulse steroid therapy, which is beneficial in MS attacks, and immune therapy for autoimmune epileptic seizures. Considering this common benefit, early initiation of pulse steroid therapy in patients with MS presenting with seizures may lead to good clinical outcomes (11).

## Ethics

**Informed Consent:** Consent form was filled out by all participants.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: G.G., Concept: G.G., Design: G.G., Data Collection or Processing: G.G., Analysis or Interpretation: A.Y., Literature Search: G.G., Writing: G.G.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

## References

- Poser CM, Brinar VV. Epilepsy and multiple sclerosis. *Epilepsy Behav* 2003;4:6-12.
- Nicoletti A, Sofia V, Biondi R, et al. Epilepsy and multiple sclerosis in Sicily: a population-based study. *Epilepsia* 2003;44:1445-1448.
- Alusi SH, Worthington J, Glickman S, Bain PG. A study of tremor in multiple sclerosis. *Brain* 2001;124:720-730.
- Pittock SJ, McClelland RL, Mayr WT, Rodriguez M, Matsumoto JY. Prevalence of tremor in multiple sclerosis and associated disability in the Olmsted County population. *Mov Disord* 2004;9:1482-1485.
- Rinker JR, Salter AR, Walker H, et al. Prevalence and characteristics of tremor in the NARCOMS multiple sclerosis registry: a cross-sectional survey. *BMJ Open* 2015;5:e006714.
- Allen AN, Seminog OO, Goldcare MJ. Association between multiple sclerosis and epilepsy: large population-based record-linkage studies. *BMC Neurol* 2013;13:189.
- Chou I, Kuo CF, Tanasescu R, et al. Epilepsy and associated mortality in patients with multiple sclerosis. *Eur J Neurol* 2019;26: 342-e23.
- Lucchinetti CF, Popescu BFG, Bunyan RE, et al. Inflammatory cortical demyelination in early multiple sclerosis. *N Engl Med J* 2011;365:2188-2197.
- Kutzelnigg A, Lucchinetti CF, Stadelmann C, et al. Cortical demyelination and diffuse white matter injury in multiple sclerosis. *Brain* 2005;128:2705-2712.
- Atmaca MM, Gürses C. Status epilepticus and multiple sclerosis: a case presentation and literature review. *Clin EEG Neurosci* 2018;49:328-334.
- Melvin JJ, Hardison HH. Immunomodulatory treatments in epilepsy. *Semin Pediatr Neurol* 2014;21:232-237.
- Kürtüncü M, Altunrende B, Akman Demir G. Epilepsi ile ilişkili sistemik otoimmün hastalıklar. *Epilepsi* 2016;22(Suppl 1):58-66.
- Bell GS, Neligan A. Outcome of seizures in the general population after 25 years: a prospective follow-up, observational cohort study. *J Neurol Neurosurg Psychiatry* 2016;87:843-850.
- Langenbruch L, Krämer J, Güler S, et al. Seizures and epilepsy in multiple sclerosis: epidemiology and prognosis in a large tertiary referral center. *J Neurol* 2019;266:1789-1795.
- Spatt J, Chaix R, Mamoli B. Epileptic and non-epileptic seizures in multiple sclerosis. *J Neurol* 2001;248:2-9.
- Mahamud Z, Burman J, Zelano J. Risk of epilepsy after a single seizure in multiple sclerosis. *Eur J Neurol* 2018;25:854-860.
- Sponsler JL, Kendrick-Adey AC. Seizures as a manifestation of multiple sclerosis. *Epileptic Disord* 2011;13:401-410.
- Chou IJ, Kuo CF, Tanasescu R, et al. Epilepsy and associated mortality in patients with multiple sclerosis. *Eur J Neurol*. 2019;26:342-e23.
- Gasparini S, Ferlazzo E, Ascoli M, et al. Risk factors for unprovoked epileptic seizures in multiple sclerosis: a systematic review and meta-analysis. *Neurol Sci* 2017;38:399-406.