

## Epilepsy Mimicking Migraine: Is It Migralepsy?

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**Abstract:** Paroxysmal disorders such as migraine can resemble epileptic seizures. Due to similar clinical manifestations, seizures may be misdiagnosed with migraine or vice versa. We present a case with epilepsy who had been misdiagnosed as migraine. It should be always kept in mind if a patient does not improve from the treatment of migraine, he or she should be investigated further to rule out epileptic neuronal activity or even sometimes organic lesions in brain.

**Keywords:** Headache, Migraine, Epilepsy, Oligoastrocytoma, MRI, Migralepsy

### INTRODUCTION

Migraine is one of the most common causes of headache. It was shown that migraine and epilepsy have shared genetic susceptibility. Additionally clinical presentation of these 2 may be very similar in some cases. There is gray zone between migraine and epilepsy, "migralepsy" is claimed to be in the middle of that zone [1-6]. Because of the dramatic neurological manifestations of the seizure, headache during seizure is often neglected but it should be remembered that epileptic seizures may present with headache as the sole or predominant clinical manifestation, although this is relatively a rare condition [2]. In this case-report, we presented a case with epileptic seizure misdiagnosed as migraine.

### CASE REPORT

13-year-old male suffered from headache occurring approximately once a day since the age of 11. His headache was throbbing and tended to be right-sided at onset but then spreading to frontoparietal region. It usually persisted for an hour, although the pain sometimes lasted up to 4 hours. Two months before the presentation, he began to have confusion at the end of the attacks. His attacks were diagnosed as migraine and he was started on antimigraine treatment. His condition did not improve after treatment. In our clinic, his physical, neurological and mental examinations including fundoscopic examination were normal, although he was mildly anxious. Routine laboratory results of the patient were normal. EEG recording was obtained from patient during sleep. The duration was 90 minutes. The EEG recordings corresponded to the presence of concurrent intermittent rhythmic slow wave activity on the temporoparietal region resembling epileptiform character (Fig. 1). Due to these positive EEG findings, headache was thought

to be related to epileptic seizure rather than migraine. Furthermore, brain MRI was ordered. A lesion was on the right parietal lobe. MRI showed that there was 16 x 16 x 21 mm cortical lesion isointense to outer cortex on T1 and hyperintense to outer cortex on T2 with no significant contrast enhancement (Fig. 2). The lesion was mildly bright on ADC (Apparent Diffusion Coefficient). His magnetic resonance spectroscopic imaging (MRSI) data showed reduction of NAA level but NAA /Cho ratio was 1.3. The lesion was diagnosed as low grade astrocytoma or mixed oligoastrocytoma . The patient received anticonvulsant drug, valproic acid (20 mg/kg/day). Three weeks later, the patient recovered from headache attacks. His EEG recorded one month after the treatment was normal.

### DISCUSSION

Paroxysmal disorders such as migraine may resemble epileptic seizure [1-6]. Clinical manifestations of complex partial seizure and migraine have similarities [2, 6]. Epilepsy and headache share several pathophysiological mechanisms related to neurotransmitters, receptors and ion channels [7]. Distinction of these two different diseases is sometimes really difficult. In rare instances one may develop while the other goes on.

A recent study showed that 3% of the pediatric patients with headache had epilepsy at the same time; most often it was migraine. Among those patients 44%, the onset of epilepsy preceded that of the headache; in 27% headache started first and in 29% both started in the same year [3]. Clinical features, EEG findings and respond to treatment are not always enough for differential diagnosis.

For some, migraine is placed in the borderland of epilepsy and it is “migralepsy”. Migralepsy literally comes from combining the words migraine and epilepsy. In the most recent International Classification

of Headache Disorders (ICHD-II) of the International Headache Society, migralepsy was defined as migraine-triggered seizures [4].

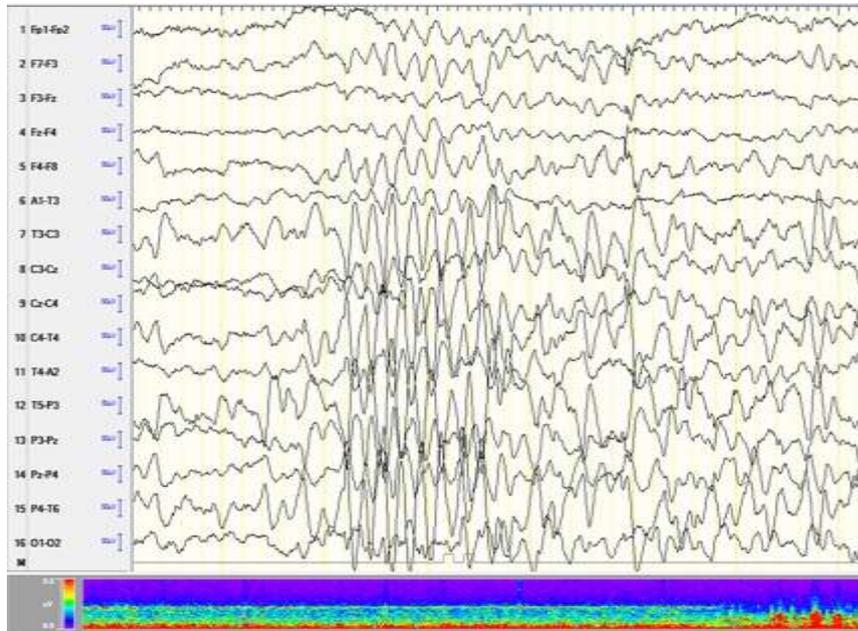


Fig. 1: Patient 1 EEG recordings after headache attack showing the presence of concurrent intermittent rhythmic generalized slow wave discharges, which are dominant in the temporoparietal regions

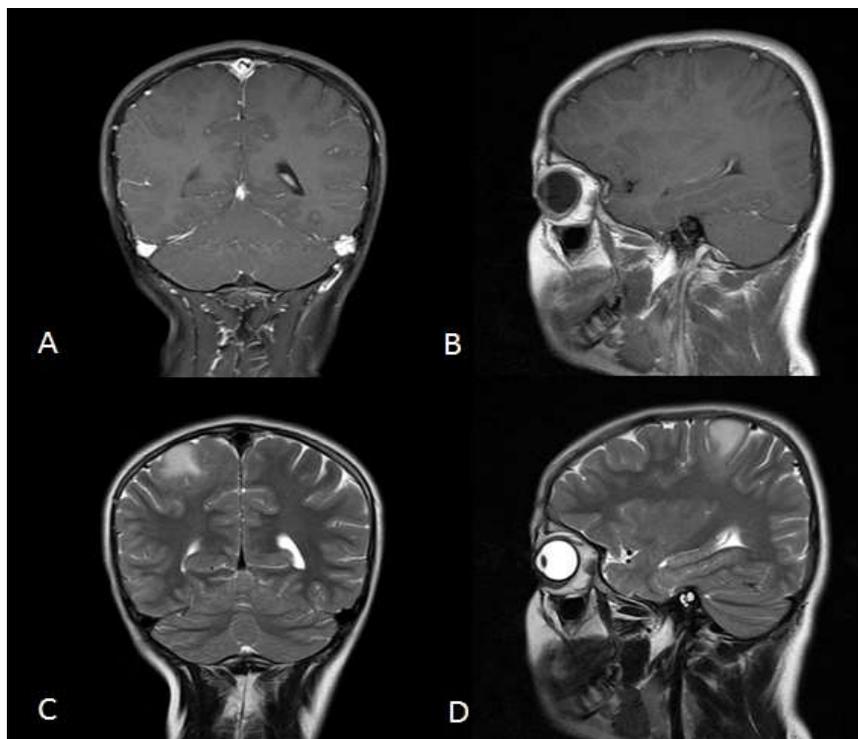


Fig. 2: Patient 1 Brain MRI showing the lesion; isointense to outer cortex in T1 weighted sequence, coronal (A), sagittal (B) planes; hyperintense lesion seen in T2 weighted sequence, coronal (C), sagittal (D) planes

Although our patient had typical migraine attacks in the past, his symptoms did not improve by the treatment. The fact that his migraine attacks got worsen and in time confusion added to the attacks were alerting signs to think about some other pathologies. Patient's symptoms resolved with the antiepileptic treatment. The clinical improvement and the repeated EEG after treatment showing no epileptic activity proved that it had epileptic component.

He had cortical lesion and that was more supportive for the diagnosis of epilepsy although it is known that these kind of lesion can cause cortical spreading depression phenomenon leading to migraine attacks [8, 9].

Although, it was showed that patients with migraine had EEG abnormalities and antiepileptics were successfully used for the treatment of migraine [3-5]. There is difference between the EEG abnormalities of epilepsy and migraine. While the EEG findings related to epilepsy are completely resolved by antiepileptics; antimigraine treatment partially recovers the abnormal EEG findings related to migraine [3-6]. In our case the repeated EEG was completely normal so that was also a proof for the diagnosis of epilepsy.

For this case, 3 most probable diagnoses were ; (i) Prolonged nonconvulsive epileptic seizure, (ii) Migraine, (iii) Coexisting migraine and epilepsy. Whichever the diagnosis was, epileptic seizure was definitely involved.

Considering the similar features of migraine and epilepsy, for patients with migraine diagnoses resistant to treatment, EEG and even MRI should be ordered to rule out any other underlying pathology. It should be reminded that sometimes it is not just migraine but also coexisting epileptic activity, sometimes it is severe migraine induced epilepsy, called "migraine epilepsy" and sometimes it is just epilepsy. Due to similar clinical findings and the gray zone between migraine and epilepsy, the debate on this subject is likely to continue.

## REFERENCES

1. Winawer MR, Connors R, Investigators E; Evidence for a shared genetic susceptibility to migraine and epilepsy. *Epilepsia*, 2013;54(2):288-95.
2. Dainese F, Mai R, Francione S, Mainardi F, Zanchin G, Paladin F; Ictal headache: headache as first ictal symptom in focal epilepsy. *Epilepsy & behavior : E&B*, 2011; 22(4): 790-792.
3. Sethi NK, Ulloa CM, Solomon GE, Lopez L; Diagnostic utility of routine EEG study in identifying seizure as the etiology of the index event in patients referred with a diagnosis of migraine and not otherwise specified headache disorders. *Clinical EEG and Neuroscience: Official Journal of the EEG and Clinical Neuroscience Society*, 2012; 43(4): 323-325.
4. Kasteleijn-Nolst Trenite D, Parisi P; Migraine in the borderland of epilepsy: "migraine epilepsy" an overlapping syndrome of children and adults? *Epilepsia*, 2012; 53 Suppl 7: 20-25.
5. Parisi P, Matricardi S, Tozzi E, Sechi E, Martini C, Verrotti A; Benign epilepsy of childhood with centro-temporal spikes (BECTS) versus migraine: a neuropsychological assessment. *Child's nervous system : ChNS : Official Journal of the International Society for Pediatric Neurosurgery*, 2012; 28(12): 2129-2135.
6. Haslam R; Migraine. 18<sup>th</sup> edition, Philadelphia: Saunders & Elsevier Inc., 2007.
7. Parisi P, Belcastro V, Striano P; Ictal epileptic headache: Moving forward. Reply to Cianchetti *et al.* *Cephalalgia*, 2014; 34(2): 156-157.
8. Heiss WD; The ischemic penumbra: how does tissue injury evolve? *Annals of the New York Academy of Sciences*, 2012; 1268: 26-34.
9. Tomita M, Tanahashi N, Takeda H, Takao M, Tomita Y, Amano T *et al.*; Astroglial swelling in the neuronal depolarization ensemble. *Acta Neurochirurgica Supplements*, 2003; 86: 219-222.