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CASE REPORT

# Photosensitive Temporal Lobe Epilepsy: A Case Report

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## Summary

Photic-induced seizures are usually generalized or arise from the occipital cortex. In the present study, we reported an unusual case of photosensitive temporal lobe epilepsy in a patient who developed photosensitive occipital lobe epilepsy between the age of 5 and 16 y and thereafter developed typical focal seizures with impaired awareness that occurred spontaneously and were induced by watching television. A typical focal seizure with impaired awareness recorded during a short video-electroencephalography monitoring induced by intermittent photic stimulation arising from the left anterior temporal region helped in confirming a diagnosis of photosensitive temporal lobe epilepsy.

Keywords: Intermittant photic stimulation; photosensitive epilepsy; reflex epilepsy; temporal lobe epilepsy; video EEG.

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## Introduction

Reflex seizures are epileptic events that are triggered by specific motor, sensory, and cognitive stimulation.[1] Of these, seizures sensitive to visual stimulation, especially flashing lights, are the most common and oldest recorded type of seizure. Such seizures can be triggered by photic stimulation and usually present as generalized seizures; however, these types of seizures can also be focal, especially in the form of occipital seizures.[2,3] Few cases of photic-induced focal seizures arising from the temporal lobe have been reported.[4–8] The present study evaluated the clinical and electrographic features of a patient diagnosed with photosensitive temporal lobe epilepsy (PTLE).

## Case Report

A 29-year-old man was followed up in our epilepsy outpatient department for 20 y. Between the ages of 5 and 16 y, he had experienced visual seizures triggered by television (TV) viewing, characterized by watching a small, square-shaped, bright, colorful object, moving to right and left, followed by head and eye deviation to the right or left side and sometimes evolving to secondarily generalized seizure. Resting electroencephalography (EEG) revealed spike and slow wave (SW) complexes located in the posterior regions, changing the side and sometimes appearing bilaterally but remaining asynchronous. Intermittent photic stimulation (IPS) increased their frequency and elicited generalized SW discharges. The background activity was normal. Under valproic acid treatment, he experienced seizures rarely until 16 y of age. At that time, he began to experience focal seizures with impaired awareness. They began with a rising sensation, followed by an arrest in activity, loss of awareness, staring, prominent oroalimentary automatism that sometimes evolved to a right brachiofacial motor seizure or generalized convulsion. In contrast to previous seizures, these appeared spontaneously and were induced by TV viewing. The seizure frequency increased; he experienced 1–3 seizures per week with a maximum of 6 seizures in a single day. The average seizure duration was 1 min, and it was associated with postictal confusion and sometimes complete amnesia during the event. Physical and neurologic examinations showed normal results. Repeat cranial magnetic resonance imaging did not reveal any abnormalities. Monotherapy with valproic acid, carbamazepine, and levetiracetam failed to lower the seizure frequency. During a short video EEG monitoring, a typical seizure beginning from the left anterior temporal region induced by IPS was recorded. IPS at 6 Hz induced widespread rhythmic theta activity with the highest amplitude over F7 lasting for about 30 s without any clinical ictal sign

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## Fotosensitif Temporal Lob Epilepsisi: Olgu Sunumu


### Özet

Fotik kaynaklı nöbetler genellikle jeneralize veya oksipital korteksten ortaya çıkar. Bu çalışmada, beş ve on altı yaşları arasında fotosensitif oksipital lob epilepsisi olan ve daha sonra kendiliğinden ortaya çıkan, ancak aynı zamanda televizyon izleyerek de indüklenen tipik bilinç etkilenimli fokal nöbetler gelişen sıra dışı bir fotosensitif temporal lob epilepsisi olgusunun sunulması amaçlanmıştır. Sol anterior temporal bölgeden kaynaklanan, intermittant fotik stimülasyon ile indüklenen kısa bir video elektroensefalografi monitörizasyonu sırasında kaydedilen tipik bir bilinç etkilenimli fokal nöbet, ışığa duyarlı temporal lob epilepsisinin tanısını doğrulamıştır.


Anahtar sözcükler: İntermittant fotik stimülasyon; fotosensitif epilepsi; refleks epilepsi; temporal lob epilepsisi; video elektroensefalografi.

(Fig. 1a, b). Thereafter, the patient began to swallow, and there was rhythmic polyspike and SW activity over the same region intermixed with swallowing of artifacts (Fig. 2). Then, his eyes and his head turned to the right side, and the seizure evolved into a right brachiofacial motor seizure. At the time of writing this report, the patient was being followed up, with polytherapy, including levetiracetam 1500 mg/d, valproic acid 2000 mg/d, and pregabalin 300 mg/d. Under this treatment, he has not experienced any seizure during the previous 2 y and reports a satisfactory quality of life. The patient and his parents did not agree for a second and longer video-EEG monitoring for recording a second seizure.

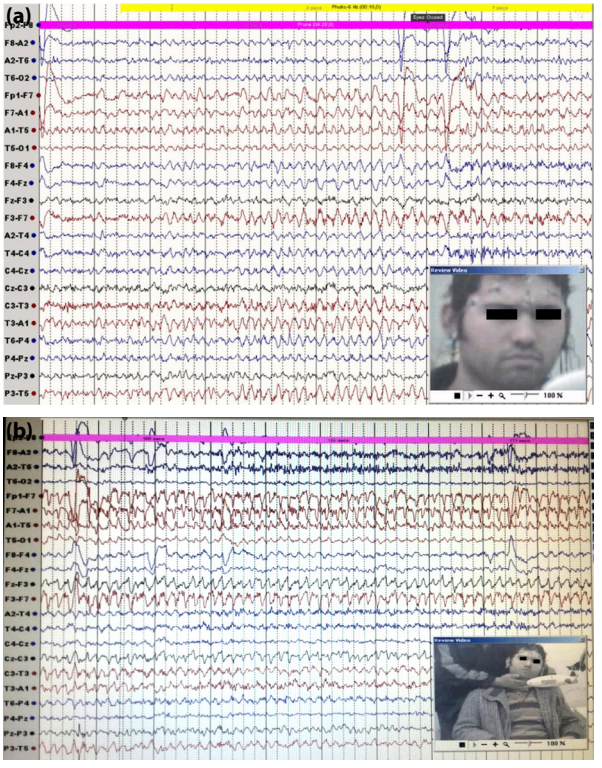


**Fig. 1.** **(a, b)** IPS at 6 Hz induced widespread rhythmic theta activity with the highest amplitude over F7 electrode.

## Discussion

Photosensitivity is defined as an abnormal clinical and electroencephalographic response to visual stimuli.[3] Photosensitive epilepsy usually represents with generalized seizures and includes eyelid myoclonus with or without impairment in consciousness, myoclonic jerks, absences and generalized convulsion.[1] The pathogenesis of photosensitivity is not elucidated in detail. As per some experts, occipital hyperexcitability plays a crucial role in the pathogenesis.[9,10] In fact, PS can induce occipital lobe seizures, the main seizure type in idiopathic photosensitive occipital lobe epilepsy (IPOLE). This hypothesis is supported by animal studies; it is known that bioccipital resection eliminates the epileptic discharges in naturally photosensitive baboons Papia-papia.[11]

Few case reports of Photic stimulation induced seizures originating from the temporal lobe have been published.[4–8] Benbadis et al.[4] first mentioned that true temporal lobe epilepsy can be photosensitive. They provided detailed, sophisticated neurophysiological data, showing that the epileptogenic zone in their patient was in the temporal lobe and confirmed their diagnosis based on the cessation of seizures following a temporal lobectomy.[4] In 1999, another

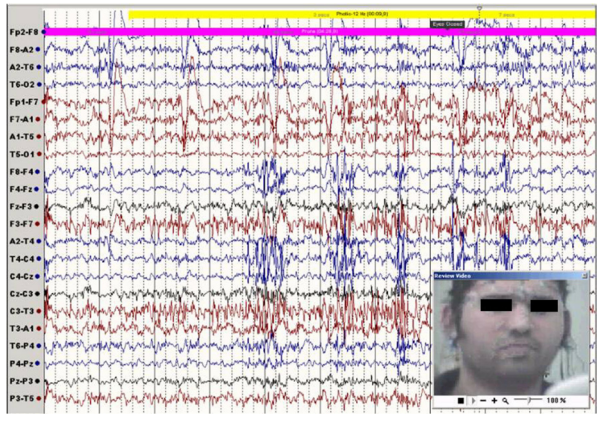

**Fig. 2.** Rhythmic polyspike and slow wave activity over the same region intermixed with swallowing artifacts.

three cases of focal seizure with impaired awareness induced by PS were reported.[5,6] Thereafter, Inoue et al.[7] drew attention to an alternative afferent pathway from the extraocular muscles or orbicularis oculi that can cause temporal lobe epilepsy. Their assumption was based on the observation that photoparoxysmal response in their patient occured not only during PS, but also when the patient closed her eyes during an eye-opening test in complete darkness.[7] Recently, Lee et al.[8] reported the case of a patient with photic-induced focal seizure with impaired awareness. The authors emphasized that photic-induced temporal seizures can occur alone without the coexistence of idiopathic generalized epilepsy.[8]

Between the ages of 5 and 16 y, our patient had occipital seizures induced by TV viewing. His clinical and EEG features were consistent with IPOLE. However, his later seizures were typically focal seizures with impaired awareness, triggered by TV viewing, but also occurring spontaneously. During these seizures, he did not experience any visual symptoms, such as loss of vision, flickering of lights, and blurring or figurative hallucination, that indicated an occipital origin. His recorded seizure induced by PS and arising from the left anterior temporal region confirmed the diagnosis of PTLE.

Our case report has certain some limitations. We cannot state with certainty that the epileptogenic zone is indeed in the temporal lobe and not a spreading phenomenon from the occipital lobe because we could not perform intracranial EEG monitoring, ictal SPECT, or PET. Moreover, we could not confirm our diagnosis with surgical outcome. The most noteworthy feature in our patient was that he developed two different but similar epileptic syndromes successively. Herein, we wish to focus on the converging evidence that members of benign childhood seizure susceptibility syndromes are now considered as part of a single continuous spectrum of disorders. They are genetically determined with functional derangement of the systemic brain maturation.[12] In this respect, the same patient commonly experiences two distinct epileptic syndromes one after the other. Some pediatric patients may develop rolandic epilepsy after Panayiotopoulos Syndrome or some children with rolandic epilepsy may present with autonomic seizures referable to Panayiotopoulos Syndrome.[13] In terms of EEG, the epileptogenic focus in these children is first located in the posterior part of the brain and later with growing age slides to the centro-temporal region that corresponds to maturation.[12] We think that a similar evolution process exists for regional photosensitivity related to maturation. Thus, epileptic syndromes are dynamic processes that can evolve into another type, and the distinction among the types of seizures remains unclear.

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