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Case Report

Mesial Temporal Lobe Epilepsy as a Common but Elusive Case: A Case Report

Darren Junior[1], Putu Kintan Wulandari[2], Saktivi Harkitasari[3*], I Wayan Sumardika[4], Komang Trisna Sumadewi[5]

1) Clinical Clerkship Program, Faculty of Medicine, Udayana University, Bali, Indonesia
2) Clinical Clerkship Program, Faculty of Medicine, Udayana University, Bali, Indonesia
3) Department of Neurology, Faculty of Medicine, Warmadewa University, Bali, Indonesia
4) Department of Pharmacology and Therapeutic, Faculty of Medicine, Udayana University, Bali, Indonesia
5) Department of Anatomy and Histology, Faculty of Medicine, Warmadewa University, Bali, Indonesia

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Correspondence:
saktiviharikitasari85@gmail.com

ABSTRACT

Epilepsy is a common neuronal disorder that could include partial or generalized seizures due to abnormal brain electrical activity. A 32-year-old female patient was presented to the emergency room with a chief complaint of seizure. The seizure semiology started with epigastric pain, which then progressed into sudden speech arrest. Afterward, the patient experienced left-sided head movement followed by jerkings on the left hand. The patient then became unconscious and experienced full body rigidity. Physical examinations, vital signs, and laboratory results showed no abnormalities. Diagnostic assessments only showed unspecific signs of diffuse cerebral edema through a CT Scan and an atrophy of the right hippocampus with a slight increase in FLAIR signal intensity and dilatation of the right lateral ventricle pericornu through MRI. The patient was given phenytoin and folic acid twice daily. The presence of right mesial temporal sclerosis served as a possible cause of epilepsy in this patient despite having several obscurities. The patient showed atypical signs of generalized tonic seizure progression, adult-onset seizures, and increased MRI FLAIR signal intensity. More detailed examinations and constant reports of epilepsy cases are highly needed among physicians to provide more specific methods and tools to diagnose, classify, and treat epilepsy in the future.

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INTRODUCTION

Epilepsy is a centuries-old chronic noncommunicable disease affecting the brain through abnormal electrical discharges of the brain cells. These abnormal electrical activities of the brain could result in partial or generalized seizure episodes, which vary in duration and frequency (WHO, 2023). Patients could be diagnosed with epilepsy after experiencing two or more unprovoked seizures 24 hours apart or one unprovoked seizure but with a high recurrence risk of >60% over the next 10 years (Thijs, Surges, O'Brien, & Sander, 2019). Seizures may present with varying characteristics depending on the site of abnormal electrical discharges. Patients may experience loss of consciousness, uncontrolled jerkings or stiffness, and disturbances in movement, sensation, and cognitive functions (WHO, 2023).

Epidemiologically, epilepsy is a common neuronal disorder affecting over 70 million people worldwide. Epilepsy can be classified at three levels, starting from the type of seizure, the type of epilepsy, and then the syndrome (Thijs et al., 2019). According to the latest multilevel operational classification system by the International League Against Epilepsy (ILAE) 2017, seizures are classified into focal, generalized, and unknown onset. After the classification of seizure type, epilepsy can then be classified into focal, generalized, combined, or unknown (Fisher et al., 2019, 2017).

Temporal lobe epilepsy (TLE) is the most common type of focal epilepsies, as the temporal lobe is the most common region for epileptogenicity (Joshi & Klein, 2019; Nayak & Bandyopadhyay, 2023). TLE can be further classified into lateral temporal lobe epilepsy and mesial temporal lobe epilepsy (MTLE), which occurs in almost 80% of all TLEs. The detection and evaluation of MTLE need a comprehensive analysis of available diagnostic assessments, including electrophysiological and neuroimaging modalities, such as electroencephalography (EEG) and magnetic resonance imaging (MRI) (Nayak & Bandyopadhyay, 2023). In this article, we highlighted a possible case of MTLE with its presented characteristics. A better understanding and specific classification of this disease amongst physicians may help determine appropriate therapies and improve patient's quality of life.

CASE REPORT

History taking

A 32-year-old female patient presented to our emergency room setting with a chief complaint of seizure before admission. Witnesses reported the chronology of the event started with the patient experiencing epigastric pain followed by sudden speech arrest and seizure sequence starting from the movement of the patient's head to the left side. Following the head movement, the patient experienced jerking on her left hand before proceeding to fall unconscious and experience complete body rigidity. The patient reported having suffered from a similar seizure episode approximately seven months ago.

Clinical examination

Baseline vital signs were within normal limits and physical examination showed no abnormal findings upon presentation. Laboratory testing also showed no significant results.

Diagnostic assessments

We performed CT Scan, EEG, MRI, and Magnetic Resonance Angiography (MRA) as basic procedures in epilepsy diagnosis. The results from EEG and MRA both suggested normal findings where MRA showed no signs of stenosis, aneurysm, or arteriovenous

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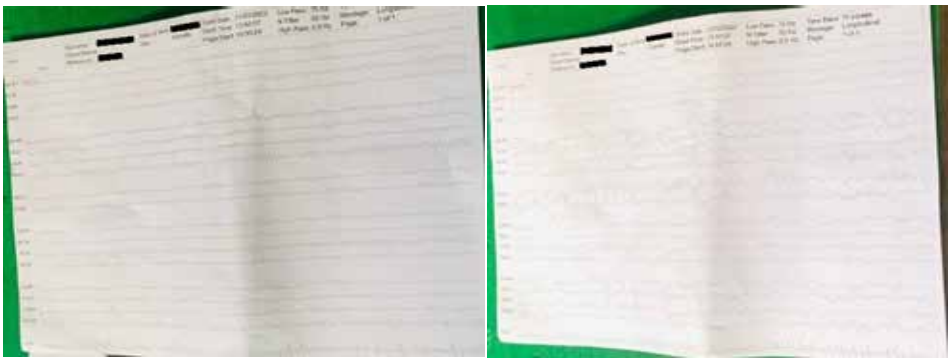
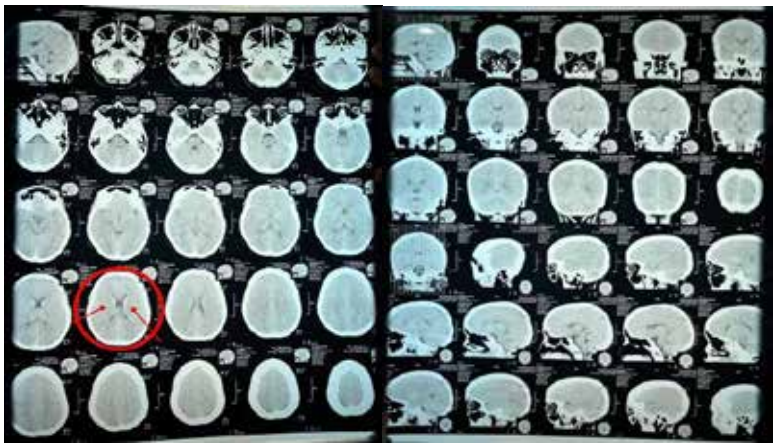


Figure 1. EEG in the State of Sleep and Awake



malformation (Figure 1). The result from CT Scan only showed unspecific signs of diffuse cerebral edema. The diffuse cerebral edema was marked by an extensive and bilateral obscure cortex-subcortex border, widened cortical gyri, and narrowed sulci (Figure 2). Results from the MRI found atrophy of the right hippocampus with a slight increase in FLAIR signal intensity and dilatation of the right lateral ventricle pericornu. The sequence of seizures started from left focal symptoms, and these MRI findings suggested the presence of mesial temporal sclerosis (MTS). Based on our history taking and MRI Scan results, we suspected this to be a case of MTLE.

Therapeutic intervention

Pharmacologically, we provided a 100-milligram phenytoin prescription twice daily, adding 1 milligram of folic acid in anticipation of the phenytoin's folate-reducing side effect.

DISCUSSION

The clinical and diagnostic findings on the patient showed results that suggested the diagnosis of MTLE with MTS despite having several obscurities. TLE is one of the most common focal epilepsies, with MTS or hippocampal sclerosis as its most prevalent pathological characteristic. MTS is associated with focal seizures, which could present with or without the loss of awareness. The typical symptoms of focal seizure without impaired awareness start with a peculiar odor or abdominal sensation called an epigastric aura. Afterward, if the seizure proceeds into a focal seizure with impaired awareness, the automatism of the mouth and extremities can be typically seen. Since MTS epileptogenic focus is located in brain regions associated with language and memory functions, seizure episodes usually also present with transient

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impairment of speech function during or after its occurrence. It was also reported that some of the focal seizures of MTS could evolve into a generalized tonic-clonic seizure (Danoun, 2020; Ono & Galanopoulou, 2012). These symptoms are in accordance with the seizure semiology reported in the case of our patient, who first experienced epigastric pain then, followed by sudden speech arrest, movement of the head to the left, and jerking of the left hand before finally losing consciousness. However, the patient only experienced a state of generalized tonic seizure after losing consciousness, which differs from the typical generalized tonic-clonic seizure reported in several studies (Danoun, 2020; French et al., 1993).

Several studies reported that episodes of MTLE seizures typically begin between early childhood and adolescence ages (4-16 years of age). The specific etiology of MTS, with diverse possible causes, remains unclear but is most often associated with prolonged febrile seizures, genetic susceptibility, autoimmune disease, or infection. Despite still being unclear, the possible causes are in accordance with the findings of febrile seizures being present in the history of most patients in several studies (Danoun, 2020; Engel Jr., 2001, 2005; French et al., 1993). However, the patient in our case reported only having experienced two episodes of seizure occurring seven months apart without a history of childhood seizures. This could be an interesting case of rare adult-onset MTLE. A study by Soeder *et al*. (2009) suggested that adult-onset MTLE should always consider the existence of an autoimmune condition unless another type of disorder, such as tumors, could be identified. Limbic encephalitis could be an underestimated prevalent autoimmune etiology of adult-onset MTLE.

Despite the availability of various modalities for pre-surgical epilepsy diagnosis, MRI still remains the gold standard for brain lesion localization and evaluation. Hence, the presence of MTS in the hippocampus should be evaluated using MRI for better sensitivity and specificity. The MRI imaging results of MTS might include atrophy in the hippocampal region, increased T2 signal, and abnormal morphologies (Advanced Neurosurgery Associates, 2023; Gaillard, El-Feky, & Baba, 2023). The MRI result from our study showed an atrophied right hippocampus and dilated morphology of the right lateral ventricle periconu. However, our result showed a slight increase in FLAIR signal intensity compared to the typical finding of increased T2 signal. Another modality is the EEG test, which could help identify the seizure focus. However, the results from EEG usually only show abnormal signs when performed during seizure episodes, which means it does not always rule out the presence of epilepsy when performed under a patient's normal condition, such as in our report (Epilepsy Society, 2021).

Epilepsy is one of the most common neuronal disorders affecting millions worldwide and is part of daily clinical practice in the field of neurology. However, the diagnosis of epilepsy still faces numerous challenges ranging from false positives, under-reporting from patients, and ambiguous symptomatic presentations, which hinder the determination of specific epilepsy types. One of the most significant challenges is epileptic seizures being transient and occurring at unpredictable times, which causes attending physicians to have a direct evaluation of the episodes rarely. The majority of even the most experienced physicians would still have difficulty in reaching an undisputable diagnosis on the specific types of epilepsy as many of the cases showed atypical presentations, inadequate historical data from patients, or

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overlapping symptoms (Elger & Hoppe, 2018; Hampel, Garces-Sanchez, Gomez-Ibanez, Palanca-Camara, & Villanueva, 2019; Manole et al., 2023).

The patient, in our case was prescribed phenytoin and an additional folic acid to counter phenytoin's folate-reducing side effect. In common practice, carbamazepine and/or phenytoin as monotherapy are the appropriate medications for managing MTLE. Higher serum levels than those used for generalized seizures may be necessary, and medication should be increased until seizures stop or unacceptable side effects occur. Oxcarbazepine is more effective than carbamazepine, but patients may tolerate higher dosages with fewer side effects. In some individuals, this can make a difference in seizure control. Valproate, topiramate, or lamotrigine are of benefit when carbamazepine and phenytoin fail. Combinations of drugs are usually ineffective, except clobazam associated with carbamazepine or phenytoin. When seizures become refractory to medical treatment, they are unlikely to remit spontaneously. With long-duration of uncontrolled seizures, increasing memory problems and other behavioral disturbances are usually reported. This sequence of events suggests that MTLE may be a progressive epileptic disorder. Because of the psychosocial consequences of disabling epilepsy in adolescence and early adulthood, patients who may have MTLE should be referred to epilepsy centers as soon as it is apparent that control cannot be achieved with first-line medications. These patients are excellent candidates for surgical treatment, with a great chance of becoming free of disabling seizures. Psychosocial intervention is also crucial in managing many patients with MTLE and is particularly important for rehabilitation following successful surgery (Cendes, 2005).

Resective surgery, as one of the non-pharmacological modalities in treating MTLE cases, has been proven effective in eliminating reoccurring seizure episodes in approximately 70% of cases (McIntosh, Wilson, & Berkovic, 2001). The randomized trial by Wiebe, Blume, Girvin, and Eliasziw (2001) showed that 42% of the patients who underwent surgical procedures were free from reoccurring seizure episodes compared to only 8% of pharmacologically treated patients. It was also reported that surgical procedures could reduce the rate of sudden unexpected death in epilepsy (SUDEP). Postoperative complications were reportedly rare, with a mortality rate of less than 1% (Wiebe, Blume, Girvin, & Eliasziw, 2001). The outcomes following MTLE surgical procedures were found to be similar in both adult and pediatric populations. These excellent outcomes have made resective surgery the current standard treatment for MTLE and should be considered as an approach for the patient reported in our case since it was recommended for MTLE patients with hippocampal sclerosis to be referred early for pre-surgical evaluation (Mathon et al., 2015).

It should be highlighted that the majority of MTLEs have the risk of developing pharmacoresistant traits over time and would need non-pharmacological modalities, such as resective surgery, as alternatives. However, these modalities would require a specific type of epilepsy and the accurate localization of lesions for more successful outcomes. Hence, the elusive nature of diagnosing specific epilepsy types poses a crucial challenge that should be further addressed (Berg, 2009; Nayak & Bandyopadhyay, 2023; Pohlen, Jin, Tobias, & Maheshwari, 2017).

CONCLUSION

In conclusion, MTLE is a form of focal epilepsy and also one of the most common types of epilepsy in general. Despite being common and having its typical symptoms,

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the specific diagnosis of MTLE still poses a challenge due to atypical presentations, inadequate historical data from patients, or overlapping symptoms. The particular diagnosis and accurate localization of brain lesions in MTLE cases are essentially crucial for the execution of surgical procedures, which are proven to yield better outcomes than pharmacological modalities. Therefore, more detailed examinations and constant reports of epilepsy cases are highly needed among physicians to provide more specific methods and tools to diagnose, classify, and treat epilepsy in the future.

REFERENCES

Advanced Neurosurgery Associates. (2023). Epilepsy Diagnosis. Retrieved October 23, 2023, from Advanced Neurosurgery Associates website: https://ana-neurosurgery.com/epilepsy/diagnosis/#:~:text=Epilepsy Testing and Diagnosis&text=Electroencephalogram (EEG)%2C which helps,locating and evaluating brain lesions

Berg, A. T. (2009). Identification of Pharmacoresistant Epilepsy. *Neurologic Clinics*, *27*(4), 1003–1013. https://doi.org/10.1016/j.ncl.2009.06.001

Cendes, F. (2005). Mesial Temporal Lobe Epilepsy Syndrome: An Updated Overview. *Journal of Epilepsy and Clinical Neurophysiology*, *11*(3), 141–144. https://doi.org/10.1590/S1676-26492005000300006

Danoun, O. (2020). Mesial Temporal Sclerosis (MTS). Retrieved October 23, 2023, from Epilepsy Foundation website: https://www.epilepsy.com/causes/structural/mesial-temporal-sclerosis

Elger, C. E., & Hoppe, C. (2018). Diagnostic challenges in epilepsy: seizure under-reporting and seizure detection. *The Lancet Neurology*, *17*(3), 279–288. https://doi.org/10.1016/S1474-4422(18)30038-3

Engel Jr., J. (2001). Mesial temporal lobe epilepsy: What have we learned? *Neuroscientist*, *7*(4), 340–352. https://doi.org/10.1177/107385840100700410

Engel Jr., J. (2005). NATURAL HISTORY OF MESIAL TEMPORAL LOBE EPILEPSY WITH HIPPOCAMPAL SCLEROSIS : How does kindling compare with other commonly used animal models ? *Kindling 6*, 371–384. New York: Springer.

Epilepsy Society. (2021). EEG (Electroencephalogram). Retrieved October 23, 2023, from Epilepsy Society website: https://epilepsysociety.org.uk/about-epilepsy/diagnosing-epilepsy/electroencephalogram-eeg#:~:text=An EEG can usually show,to identify with an EEG.

Fisher, R. S., Cross, H., D'Souza, C., French, J. A., Haut, S., Higurashi, N., … Zuberi, S. (2019). 2017 International League Against Epilepsy classifications of seizures and epilepsy are steps in the right direction. *Epilepsia*, *60*(6), 1040–1044. https://doi.org/10.1111/epi.15052

Fisher, R. S., Cross, J. H., French, J. A., Higurashi, N., Hirsch, E., Jansen, F. E., … Zuberi, S. M. (2017). Operational classification of seizure types by the International League Against Epilepsy: Position Paper of the ILAE Commission for Classification and Terminology. *Epilepsia*, *58*(4), 522–530. https://doi.org/10.1111/epi.13670

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JURNAL KEDOKTERAN FKUM SURABAYA
http://journal.um-surabaya.ac.id/index.php/qanunmedika

French, J. A., Williamson, P. D., Thadani, V. M., Darcey, T. M., Mattson, R. H., Spencer, S. S., & Spencer, D. D. (1993). Characteristics of medial temporal lobe epilepsy: I. Results of history and physical examination. *Annals of Neurology*, *34*(6), 774–780. https://doi.org/10.1002/ana.410340604

Gaillard, F., El-Feky, M., & Baba, Y. (2023). Mesial temporal sclerosis. Retrieved October 23, 2023, from Radiopaedia website: https://radiopaedia.org/articles/mesial-temporal-sclerosis

Hampel, K. G., Garces-Sanchez, M., Gomez-Ibanez, A., Palanca-Camara, M., & Villanueva, V. (2019). [Diagnostic challenges in epilepsy]. *Revista de Neurologia*, *68*(6), 255–263. https://doi.org/10.33588/rn.6806.2018242

Joshi, C., & Klein, H. (2019). Temporal Lobe Epilepsy (TLE). Retrieved October 23, 2023, from Epilepsy Foundation website: https://www.epilepsy.com/what-is-epilepsy/syndromes/temporal-lobe-epilepsy

Manole, A. M., Sirbu, C. A., Mititelu, M. R., Vasiliu, O., Lorusso, L., Sirbu, O. M., & Ionita Radu, F. (2023). State of the Art and Challenges in Epilepsy—A Narrative Review. *Journal of Personalized Medicine*, *13*(4). https://doi.org/10.3390/jpm13040623

Mathon, B., Bédos Ulvin, L., Adam, C., Baulac, M., Dupont, S., Navarro, V., … Clemenceau, S. (2015). Surgical treatment for mesial temporal lobe epilepsy associated with hippocampal sclerosis. *Revue Neurologique*, *171*(3), 315–325. https://doi.org/10.1016/j.neurol.2015.01.561

McIntosh, A. M., Wilson, S. J., & Berkovic, S. F. (2001). Seizure outcome after temporal lobectomy: Current research practice and findings. *Epilepsia*, *42*(10), 1288–1307. https://doi.org/10.1046/j.1528-1157.2001.02001.x

Nayak, C. S., & Bandyopadhyay, S. (2023). *Mesial Temporal Lobe Epilepsy*. Treasure Island (FL): StatPearls Publishing. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK554432/

Ono, T., & Galanopoulou, A. S. (2012). EPILEPSY AND EPILEPTIC SYNDROME. *Advances in Experimental Medicine and Biology*, *724*, 99–113. https://doi.org/10.1007/978-1-4614-0653-2_8

Pohlen, M. S., Jin, J., Tobias, R. S., & Maheshwari, A. (2017). Pharmacoresistance with Newer Anti-Epileptic Drugs in Mesial Temporal Lobe Epilepsy with Hippocampal Sclerosis. *Epilepsy Research*, *137*, 56–60. https://doi.org/10.1016/j.eplepsyres.2017.09.012

Thijs, R. D., Surges, R., O'Brien, T. J., & Sander, J. W. (2019). Epilepsy in adults. *The Lancet*, *393*(10172), 689–701. https://doi.org/10.1016/S0140-6736(18)32596-0

WHO. (2023). Epilepsy. Retrieved October 23, 2023, from World Health Organization website: https://www.who.int/news-room/fact-sheets/detail/epilepsy

Wiebe, S., Blume, W. T., Girvin, J. P., & Eliasziw, M. (2001). A randomized, controlled trial of surgery for temporal-lobe epilepsy. *The New England Journal of Medicine*, *345*(5), 311–318. https://doi.org/10.1056/NEJM200108023450501