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A Case Report - The Underlying Disease Behind Chronic Headache: More Than Just a Primary Headache?

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ABSTRACT

Chronic headache in adolescents is a diagnostic challenge due to overlapping primary and secondary causes. Lifestyle factors such as sleep deprivation or academic and psychosocial stress play an important role. An 18-year-old male presented to the neurology outpatient clinic on January 6, 2026, with a 2-year history of headache, worsening in the last year. The headache was described as band-like, moderate intensity, intermittent, lasting <1 minute, frequency 2 times per day. Sleep duration <6 hours/day. Physical and neurological examination was within normal limits: BP 119/84 mmHg, HR 88/min, BMI 19.03. Motor strength 5/5, physiological reflexes normal, pathological reflexes negative. A detailed clinical history revealed that the patient had recently been experiencing persistent feelings of guilt, with complaints consistently arising after masturbation. As his thinking matured, this also gave rise to anxiety regarding the potential impact on his reproductive system—specifically, a fear of becoming infertile. Uncontrollable urges to masturbate would arise sporadically. The patient is a fourth-semester university student who leads an active social and athletic life. These findings raised a suspicion of autonomic epilepsy, prompting appropriate supplementary examinations. A head CT scan showed mild cerebral edema, with no evidence of masses or hemorrhage. An EEG revealed diffuse abnormal irritative activity consistent with moderate-to-high voltage epileptiform discharges. Subsequently, the patient was managed as an autonomic epilepsy, and all complaints improved with treatment Folic Acid 1 mg once daily and Phenytoin 100 mg twice daily.Clinical features initially suggested tension-type headache. A more detailed and in-depth clinical history guides the performance of relevant supplementary examinations. However, abnormal EEG and mild cerebral edema require further evaluation to rule out secondary causes and comorbidities. Sleep deprivation may lower pain threshold and increase cortical excitability. Recurrent spontaneous autonomic impulses and abnormal EEG findings point to the occurrence of autonomic epileptic seizures. A mild cerebral edema on the head CT scan likely result from recurrent electrical brain activity associated with the seizures. Comprehensive biopsychosocial history and ancillary examinations are essential in chronic headache in adolescents. Incidental CT and EEG findings should be interpreted cautiously with clinical correlation.

INTRODUCTION

Headaches are one of the most frequent complaints at neurology clinics, with a high prevalence among people of productive age. The International Classification of Headache Disorders, 3rd edition (ICHD-3), divides headaches into primary (migraine, tension-type headache, cluster) and secondary. In late adolescents, triggers such as academic stress, sleep deprivation, and lifestyle are often overlooked.1,2,3

The World Health Organization (WHO) reports that globally, it is estimated that the prevalence of adults experiencing headaches currently (symptoms at least once in the past year) is around 50%. Half to three-quarters of adults aged 18-65 worldwide suffered from headaches in the past year, and 30% or more of them reported cephalgia. This case report presents a case of chronic headache in an 18-year-old male with supportive findings that require attention.1,2,3

METHODS

Medical History

An 18-year-old man, a fourth-semester psychology student, came to the neurology clinic on January 6, 2026. His main complaint is a headache that he's been experiencing for about 2 years, which has worsened in the past year. The pain is described as tight, moderate in intensity, comes and goes, lasts less than a minute, and occurs twice a day. Stress from academics and psychosocial factors were denied as triggers. He does not experience photophobia, phonophobia, nausea, vomiting, fever, chills, sweating during attacks, loss of consciousness, or seizures. The patient remains fully conscious during attacks and remembers the events. Over the past 2 years, he has tried to manage it with over-the-counter headache medicine. He has also visited health centers and a family doctor several times, but the complaints have not improved. History of seizures (-), febrile seizures (-), brain tumor (-), head injury (-), brain infection (-). No family members have similar illnesses. Social history: sleep pattern <6 hours/day, does not consume alcohol, drugs, or smoke. The provisional diagnosis is tension headache (tension type headache / TTH).

Further anamnesis revealed that the onset of the attacks reported by the patient is related to periods of sexual activity, namely urges to masturbate that appear uncontrollably from time to time. When these urges occur, they are accompanied by headaches. The pain can disappear spontaneously after masturbating. Over time, as the patient grows older, they feel prolonged guilt each time after masturbating. Anxiety also arises about the impact on the reproductive system, specifically the fear of becoming infertile. This creates a never-ending dilemma and results in tension headaches that occur more frequently. The patient is a fourth-semester college student who is active in social life and sports. There are no problems with their socioeconomic life.

The data points to a suspicion of autonomic epilepsy. This refers to the definition of epilepsy according to the PERDOSNI (2014) epilepsy management guidelines, which states that conceptually, epilepsy is a brain disorder characterized by a tendency to cause recurrent epileptic seizures, with neurobiological, cognitive, psychological, and social consequences. Operationally, this definition is marked by having 2 unprovoked seizures or 2 reflex seizures with more than 24 hours between the first and second episodes. The World Health Organization (2024) states that epilepsy is a chronic, non-communicable brain disease characterized by recurrent seizures at least twice without provocation or a clear cause, resulting from excessive electrical discharge in the brain. These seizures can involve sensory, motor, or autonomic activity.

Based on that data, appropriate supporting examinations were carried out, namely electroencephalography (EEG) and a head CT scan. The EEG results showed an abnormal diffuse irritative pattern consistent with medium-high voltage epileptiform discharges. The head CT scan results showed mild cerebral edema without mass or bleeding. The mild cerebral edema seen on the head CT scan is likely a result of repeated bursts of brain electrical activity during epileptic seizures.

The working diagnosis was established based on additional data from a more in-depth anamnesis and the results of two supporting examinations, namely EEG and head CT scan. The working diagnosis is autonomic epilepsy with a comorbid diagnosis of TTH. The patient is subsequently managed as having autonomic epilepsy with folic acid therapy of 1 mg once daily and phenytoin 100 mg twice daily. Follow-up visits showed significant clinical improvement in all complaints. The education given to the patient included: sleep hygiene, stress management, adequate hydration, and follow-up visits for neurological evaluation and continuation of epilepsy management according to the applicable protocol.

Physical Checkup (January 6, 2026)

General Condition: good

Consciousness: Compos mentis

GCS E4V5M6

Vital Signs: BP 119/84 mmHg, Pulse 88 bpm, RR 19/min, Temperature 36°C

Anthropometry: Height 170 cm, Weight 55 kg, BMI 19.03 (ideal)

Head-neck, thorax, abdomen, extremities: no abnormalities

Neurological Status: Cranial nerves I-XII within normal limits. Motor strength 5/5 in all four limbs, normal tone and muscle mass. Physiological reflexes biceps, triceps, patella +/+ normal. Pathological reflexes Hoffman-Tromner, Babinski, Chaddock, Oppenheim -/- normal.

Supporting Examination

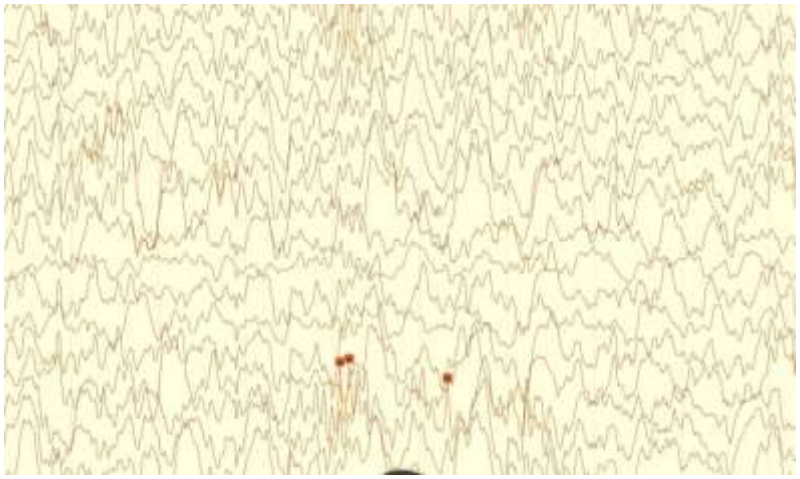


Figure 1. Electroencephalography (EEG) Results: Diffuse Abnormal Irritative Pattern Consistent With Epileptiform Discharge with Medium to High Voltage

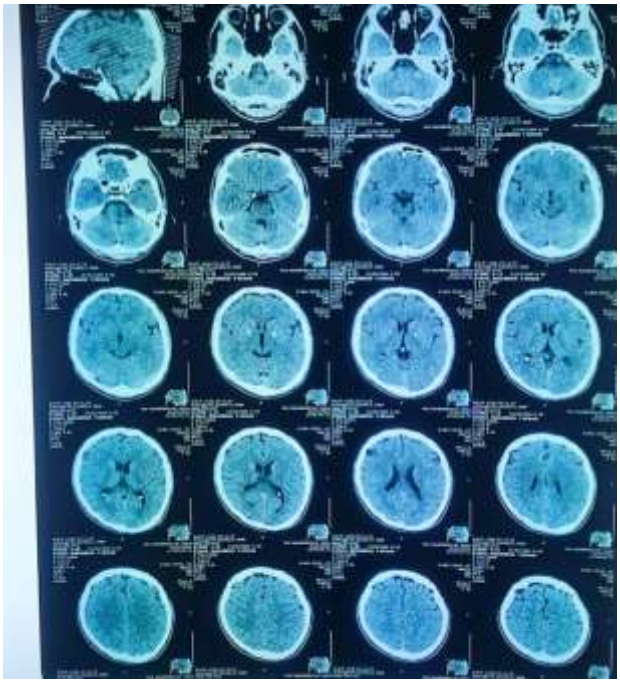


Figure 2. Head CT Scan Results: Shows Mild Cerebral Edema, No Signs of Mass or Intracerebral and Intracerebellar Bleeding

RESULTS AND DISCUSSION

Headache

The initial anamnesis in this case shows headache characteristics like a tight feeling and short duration, which point to Tension Type Headache

(TTH). This is based on literature data, which states that headaches can be classified into two types: primary headaches and secondary headaches.

a. Primary headaches are headaches with an unclear underlying cause, and they include 3 types: migraine, tension-type headache (TTH), and cluster headaches.
b. Secondary headaches are headaches where an underlying cause has already been identified. Some of these causes include:
    1. Various headaches associated with structural lesions.
    2. Headaches associated with head trauma.
    3. Headaches due to vascular disorders, for example: hypertension, bleeding.
    4. Headaches due to non-vascular intracranial disorders, for example: tumors.
    5. Headaches caused by chemical substances or withdrawal from medication.
    6. Headaches due to non-cephalic infections.
    7. Headaches due to metabolic disorders, such as hypoglycemia.
    8. Headaches or facial pain caused by problems in the head, neck, or surrounding structures, for example acute glaucoma.
    9. Cranial neuralgia, which is persistent pain originating from cranial nerves.
    10. Headaches caused by increased brain electrical activity, such as epilepsy.

Tension-type headache (TTH) is a bilateral headache that feels pressing or squeezing, tight, and not throbbing. It's not affected or worsened by physical activity, is mild to moderate in intensity, usually comes without nausea or vomiting (or only minimally), and may be accompanied by sensitivity to light or sound.

Episodic TTH is the most common primary headache, with a 1-year prevalence of around 38–74%. Average TTH prevalence ranges from 11-93%. One study reported a TTH prevalence of 87%. In Korea, TTH prevalence is between 16.2% and 30.8%, in Canada around 36%, in Germany 38.3%, and in Brazil only 13%. The incidence in Denmark is 14.2 per 1000 people per year. A population survey in the USA found an annual prevalence of episodic TTH of 38.3% and chronic TTH of 2.2%. TTH can affect any age. The most common age is 25-30 years, though the peak prevalence increases at 30-39 years. Lifetime prevalence in women reaches 88%, while in men it's only 69%. The female-to-male ratio is 5:4.

Triggers of TTH include: hunger, dehydration, work, changes in sleep patterns, caffeine withdrawal, and hormonal fluctuations in women. Stress and emotional conflicts are the most common triggers of TTH. Emotional disorders act as risk factors for TTH, while mental tension and stress are the most frequent causes of TTH.

Epilepsy

There are 3 nervous system components: motor, sensory, and autonomic. Motor is about movement. Sensory is about sensations like headache pain, feeling dizzy, or spinning. Autonomic is about feelings, like feeling happy or unhappy, sudden heart palpitations, or feelings and urges to masturbate. The causes of epilepsy are two types: genetic or acquired. Acquired epilepsy can be caused by viruses, tumors, or after trauma.

According to PERDOSNI 2014, epilepsy is a chronic functional disorder characterized by repeated epileptic seizures that occur suddenly due to abnormal or excessive brain electrical activity with various causes.

A seizure is said to be epilepsy if it meets one of three criteria, which are :

1. At least 2 seizures without provocation or reflex seizures with more than 24 hours between them.
2. One seizure without provocation or one reflex seizure with the possibility of recurring seizures within the next 10 years.
3. A diagnosis of epilepsy syndrome has already been made.

Partial seizures refer to abnormal nerve activity that is confined to just one area of the brain hemisphere and has a consistent focal or local onset. When there’s no disruption of consciousness, it’s called a simple partial seizure, and when consciousness is affected, it’s called a complex partial seizure. Patients with simple partial seizures

stay awake and aware during the seizure, and some can even talk throughout the episode. When partial seizures spread more widely, it's called a "partial seizure with secondary generalization." Partial seizures are the most common type of seizure in epilepsy patients. The incidence of all partial seizures is about 20 cases per 100,000 people between the ages of 1 to 65 in the United States. It's estimated that around 6% to 12% of epilepsy patients experience simple partial seizures; these are often linked with other types of seizures. No preference has been reported for gender, race, or ethnicity. The incidence has increased in older people, especially those with cerebrovascular disease.6,7,8,9,10,11

EpilepsiEpilepsy is categorized into three types based on the underlying cause: idiopathic or primary, symptomatic or secondary, and cryptogenic. Idiopathic (primary) epilepsy occurs even though no abnormalities have been found that might cause it, such as structural lesions in the brain or neurological deficits. Symptomatic (secondary) epilepsy is when examinations find underlying structural brain lesions such as head trauma, central nervous system infections, congenital abnormalities, compressed spaces in the brain, vascular disorders in the brain, toxins (alcohol and drugs), metabolic disorders, and neurodegenerative conditions.

It is categorized into 3 types based on the cause, namely: idiopathic or primary, symptomatic or secondary, and cryptogenic. Idiopathic (primary) epilepsy occurs but no abnormalities have been found that might cause it, such as structural lesions in the brain or neurological deficits. Symptomatic (secondary) epilepsy is when an examination finds an underlying structural brain lesion, such as head trauma, central nervous system infections, congenital abnormalities, brain space compression, blood vessel disorders in the brain, toxins (alcohol and drugs), metabolic disorders, and neurodegenerative conditions.

In 2017, the ILAE classified epilepsy based on seizure types, as shown in the diagram below:

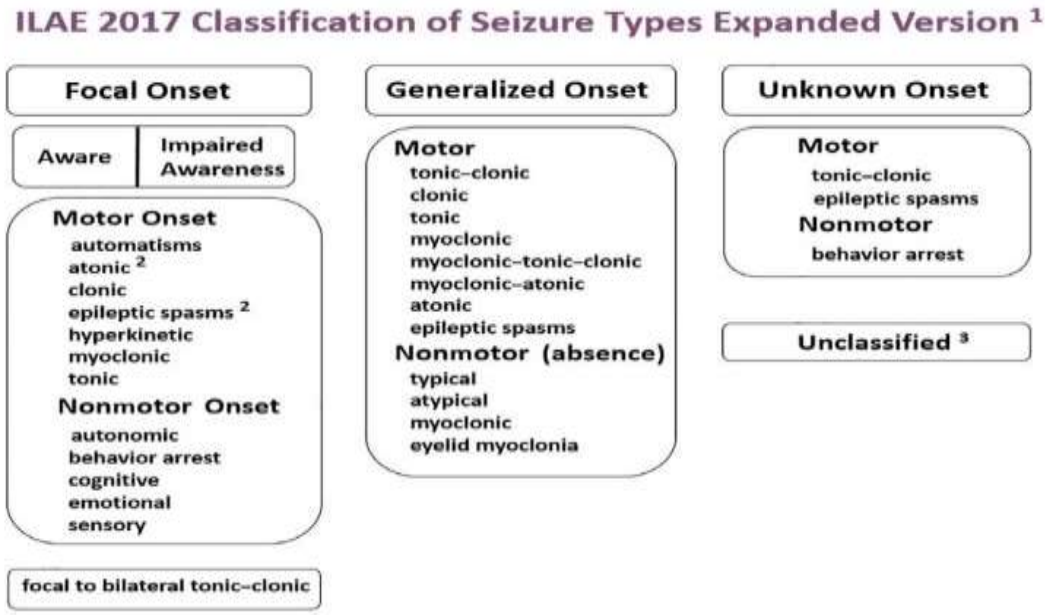


Figure 3. Classification of Epilepsy Based on Seizure Type by ILAE

In this case, based on that classification, the patient can be categorized as having simple focal epilepsy that is non-motor (autonomic). Autonomic seizures manifest with mostly altered autonomic functions. Some common autonomic signs and symptoms include sweating, chills, goosebumps, increased sensation in the epigastrium, nausea, changes in blood pressure and heart rate (usually tachycardia), and changes in the pupils.

Autonomic symptoms during an epileptic seizure can appear as a single or dominant seizure, manifesting as simple autonomic seizures, or

accompanying partial or complex generalized seizures. Autonomic symptoms are clinically and scientifically important for a few reasons. First, a better understanding of autonomic changes during seizures can help clarify the pathophysiology of serious epilepsy complications like sudden unexplained death in epilepsy (SUDEP), seizure-induced heart arrhythmias, or neurogenic pulmonary edema. Second, autonomic phenomena can help us better understand the functional organization of central autonomic system representations, that is, the central autonomic network. Third, certain autonomic symptoms like ictal vomiting, ictal urinary urgency, ictal salivation, postictal nose wiping, postictal coughing, etc., provide important clinical information about the localization and lateralization of the seizure onset zone. Fourth, simple autonomic seizures can pose diagnostic challenges for distinguishing from non-epileptic conditions. Autonomic symptoms can be divided into cardiovascular changes, respiratory manifestations, gastrointestinal symptoms, skin manifestations, pupil symptoms, genital and sexual manifestations as in this case, and urinary symptoms.

Genital aura is marked by an unpleasant somatosensory sensation, sometimes painful, scary, or emotionally neutral in the genital area and can be accompanied by ictal orgasm. Genital aura is caused by an epileptic discharge in the parasagittal postcentral gyrus where the cortical representation of genital sensation is located. In addition, and especially when the sensation is bilateral, Penfield's secondary somatosensory area can also be involved. Sexual automatisms are characterized by hypermotor movements consisting of writhing, thrusting, and rhythmic movements of the pelvis, arms, and legs, sometimes associated with rhythmic manipulation of the groin or genitals, exhibitionism, and masturbation, and are considered typical for frontal lobe seizures. Genital automatisms, on the other hand, are marked by discrete genital automatisms like reaching for or stroking the genitals, which can be accompanied by masturbation and exhibitionistic behavior. Genital automatisms are generally associated with temporal lobe seizures.

Epilepsy is diagnosed through anamnesis, which must be done carefully, in detail, and thoroughly, because the examiner almost never witnesses the seizures experienced by the patient. Explaining everything that happens before, during, and after the seizure (including the symptoms and how long the seizure lasts) is very valuable information and is key to the diagnosis. Diagnosing simple partial seizures can be difficult, especially when sensory, autonomic, or psychic symptoms are dominant.

Supportive tests for epilepsy cases include: 1) laboratory tests such as hypoglycemia, hypokalemia, hypomagnesemia, hyponatremia, hypernatremia, hyperbilirubinemia, and uremia. Therefore, checking blood levels of glucose, calcium, magnesium, sodium, bilirubin, and urea is necessary. 2) EEG examination, which is the most commonly done supportive test to establish an epilepsy diagnosis. 3) Neuroimaging to detect any brain lesions that might be causing epilepsy or associated neurodevelopmental abnormalities. This can be done using an MRI or a head CT scan. A diagnosis of epilepsy can be made through medical history and clinical examination along with EEG and radiology results, but if a seizure is observed while it's happening, an epilepsy diagnosis can already be made

CONCLUSION

Chronic headaches in teenagers require a biopsychosocial approach. Incidental findings on CT and EEG should be interpreted carefully and should not immediately change the primary diagnosis without strong clinical correlation. Lifestyle changes, improving sleep patterns, and regular follow-ups are key to management.

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