

Diagnosis of Ischemic Stroke with Manifestations of Status Epilepticus in Male Adolescents: A Case Report

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Abstract

Keywords:

Stroke; ischemic; seizure; children.

Background: Stroke in children and adolescents, though rare, presents significant diagnostic challenges due to its atypical manifestations compared to adults. Ischemic stroke in this population can initially present with seizures, including status epilepticus, potentially delaying accurate diagnosis and appropriate management. **Objective:** This case report aims to describe the clinical presentation, diagnostic process, and management of an adolescent male with acute ischemic stroke whose primary manifestation was status epilepticus, highlighting the importance of considering stroke in the differential diagnosis of new-onset seizures.

Methods: We report the case of a 14-year-old boy who presented to the emergency department with unconsciousness following prolonged seizures. Clinical history, physical examination, laboratory findings, and neuroimaging results were collected and analyzed. A non-contrast head CT scan was performed to investigate the underlying etiology.

Results: The patient experienced recurrent seizures, including a prolonged episode lasting over one hour, which constituted status epilepticus. Initial vital signs and routine laboratory tests were unremarkable. A non-contrast CT scan revealed multiple ischemic lesions in the left internal capsule, left thalamus, left corona radiata, and subcortical regions of the left temporoparietal lobe, as well as the white matter of the right parietal lobe, with mass effect compressing the left lateral ventricle. These findings confirmed the diagnosis of acute ischemic stroke. The patient received supportive care, anti-seizure medication, and antiplatelet therapy, leading to gradual clinical improvement.

Conclusion: This case underscores that ischemic stroke can present with status epilepticus in adolescents, a demographic where stroke is often not the initial consideration.

INTRODUCTION

Stroke, defined by the World Health Organization as a rapidly developing clinical syndrome of focal or global disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent non-vascular cause, is a leading cause of disability and mortality worldwide (Sacco et al., 2013). While commonly associated with the older adult population, stroke can and does occur across the lifespan, including in children and adolescents (Chiang et al., 2022; Li et al., 2022; McKinney et al., 2024; Sookdeo et al., 2024). The epidemiological landscape of stroke in the young differs significantly from that in older adults, presenting unique diagnostic and management challenges (Abidakun, 2025; Li et al., 2022; Rasing et al., 2026; Shariffuddin, 2024). Approximately 10% of all strokes occur in individuals under the age of 45, with an estimated incidence of 7-15 cases per 100,000 population per year (Griffiths & Sturm, 2011). The incidence is even rarer in the pediatric

population (1 month to 18 years), estimated at 1-8 cases per 100,000 children per year (Mahalini, 2016). Among pediatric strokes, approximately 55% are ischemic in nature, resulting from arterial or venous occlusion (Bhatia et al., 2022; Fearn et al., 2025; Gupta et al., 2025; Poisson et al., 2022).

The clinical presentation of stroke in children and adolescents is often more variable and less focal than in adults, contributing to frequent delays in diagnosis. While focal neurological deficits like hemiparesis are common, occurring in up to 94% of cases, other symptoms such as headaches (in about 30% of children) and, notably, seizures are prominent (Tsze & Valente, 2011). Seizures are a particularly important feature in pediatric stroke, occurring in 20-48% of cases at the time of presentation, a rate significantly higher than that observed in adults (Lanni et al., 2011). These seizures can occur within the first 24 hours of stroke onset and may even be the sole or presenting manifestation, potentially masking the underlying ischemic event. In a subset of patients, these seizures can be prolonged or recurrent, meeting the criteria for status epilepticus, a life-threatening neurological emergency in its own right.

The diagnostic challenge is further compounded by the broad differential diagnosis for acute neurological symptoms in children, which includes infections, metabolic disorders, migraine, and postictal states following a seizure. When a child presents with status epilepticus, the immediate clinical focus is rightly on airway, breathing, circulation, and seizure cessation. The possibility of an underlying stroke may not be immediately considered, especially in an adolescent with no obvious vascular risk factors. This diagnostic overshadowing can lead to critical delays in obtaining neuroimaging and initiating stroke-specific therapies. Transient ischemic attacks (TIAs), which precede arterial ischemic stroke in about 33% of children, may also be missed, as their fleeting symptoms (hemiparesis, speech disturbance) can be easily attributed to other causes (Anggriawan et al., 2009). The case described herein, with a history of undiagnosed transient symptoms and recurrent seizures, perfectly illustrates this diagnostic pitfall.

Neuroimaging is paramount for confirming the diagnosis of stroke and differentiating ischemic from hemorrhagic types. Non-contrast computed tomography (CT) of the head remains the first-line imaging modality in the acute setting due to its speed, wide availability, and ability to rapidly exclude intracranial hemorrhage (Tierradentro-García et al., 2023). However, CT may yield negative findings in the very early hours of an ischemic stroke. Magnetic resonance imaging (MRI), particularly with diffusion-weighted imaging (DWI), offers superior sensitivity for detecting early ischemic changes but often requires patient cooperation or sedation, which can be challenging in an unstable child. In this case, the initial clinical picture was dominated by *status epilepticus*, and the diagnosis of stroke was confirmed only after a CT scan was performed following the patient's stabilization, revealing established ischemic lesions.

The existing literature, while informative, often consists of larger cohort studies that may not fully capture the nuanced presentations of individual cases in which the diagnosis is particularly elusive. There is a need for detailed case reports that highlight specific and atypical manifestations of pediatric stroke to raise clinical awareness. This case report addresses this gap by providing a granular account of an adolescent male whose acute ischemic stroke manifested primarily as *status epilepticus* a presentation that can easily be

misattributed to primary epilepsy or other conditions. The novelty of this report lies in its detailed chronological narrative of the diagnostic journey, from the initial presentation with prolonged seizures to the eventual discovery of multifocal ischemic lesions on CT, underscoring the critical importance of maintaining a broad differential diagnosis.

The urgency of recognizing such presentations cannot be overstated. Delayed diagnosis of stroke in children can have devastating consequences, including increased risk of recurrence (10-25%), permanent neurological deficits (in over 25% of survivors), and the development of epilepsy (in over 66%) (Fan et al., 2011). Early intervention, including antiplatelet or anticoagulant therapy for secondary prevention and management of acute complications like seizures, is crucial for optimizing long-term outcomes. This case aims to contribute to the body of knowledge that helps clinician's emergency physicians, pediatricians, and neurologists recognize the potential for stroke in young patients presenting with status epilepticus. The primary objective of this report is to describe the clinical course, diagnostic workup, and management of this unique case. The benefit of this report is to serve as a teaching tool, reinforcing the principle that "time is brain" applies to all ages and that a high index of suspicion for stroke is warranted even in adolescents with atypical neurological presentations like status epilepticus.

METHOD

Case Reports

A 14-year-old male patient presented to the emergency department with a chief complaint of decreased consciousness. The patient initially experienced a seizure lasting approximately one minute, followed shortly thereafter by a second, prolonged seizure lasting more than one hour. The seizures were characterized by generalized tonic-clonic movements with upward deviation of the eyes. Following the seizure, the patient became unresponsive and lost consciousness. An *alloanamnesis* obtained from the patient's parents revealed that approximately one year prior to this presentation, the patient had been experiencing recurrent, brief seizures lasting approximately one minute each. Following those earlier episodes, the patient would regain consciousness and resume normal daily activities, including attending the first grade of Junior High School (*Sekolah Menengah Pertama/SMP*). During studying or upon falling asleep, the patient would suddenly experience seizures characterized by generalized movements or bilateral palmar rigidity. During this period, the patient had sought care at a local clinic and community health center (*puskesmas*). The patient had previously been hospitalized; however, the parents could not recall the medications prescribed, with the exception of Folic Acid 1×1 tablet orally. Due to concerns over the frequency of seizures, the patient eventually discontinued formal schooling. Approximately one week prior to this admission, the patient experienced a seizure lasting approximately 20 seconds, accompanied by headache, sudden-onset right-sided limb weakness, and dysarthric speech (*pele*). The following day, the headache and limb weakness resolved; however, the dysarthria persisted, and the patient began experiencing recurring episodes of dizziness that continued until presentation to the emergency department.

On general physical examination, the patient was found to be unconscious. Vital signs were within normal limits. Neurological examination revealed a Glasgow Coma Scale (GCS) score of E1M2V1. No signs of meningeal irritation were identified. Pupils were round and

isochoric, with bilaterally intact direct and consensual light reflexes. Corneal reflexes were present bilaterally (+/+). Routine complete blood count and random blood glucose were within normal limits. The patient was admitted to the Intensive Care Unit (ICU) and commenced on intravenous Ringer's Lactate at 20 drops per minute, intravenous Levetiracetam 500 mg in Ringer's Lactate via drip infusion, and Diazepam 10 mg intravenously to be administered as needed for breakthrough seizures. After approximately 10 hours in the ICU, the patient began to show purposeful finger movements in response to painful stimuli and intermittently opened his eyes spontaneously. Five hours thereafter, the patient regained consciousness and was able to respond to both auditory and painful stimuli. Neurological re-examination at that time demonstrated a GCS score of 15, physiological reflexes within normal limits, and the absence of pathological reflexes. On the second day of hospitalization, the patient was transferred to the pediatric inpatient ward and commenced on additional therapy comprising Citicoline 2×500 mg intravenously and Mecobalamin 3×500 mg intravenously. On the third day of hospitalization, the patient complained of vertigo and severe headache, for which additional therapy was initiated: Ceftriaxone 3×1 g intravenously, Dexamethasone 4×1 ampoule intravenously, and N-Acetylcysteine 1×1 g intravenously. A non-contrast head computed tomography (CT) scan was also performed. CT scan findings demonstrated ischemic lesions in the left internal capsule, left thalamus, left corona radiata, and the cortical–subcortical region of the left temporoparietal lobe, as well as in the white matter of the right parietal lobe, with evidence of mass effect compressing the left lateral ventricle. Following confirmation of the CT scan findings, the therapeutic regimen was further supplemented with Clopidogrel 1×75 mg orally and Disolv 3×1 tablet orally.



Figure 1. CT Scan showing the presence of ischemic lesions

On day 4 of treatment, complaints of headache and dizziness were reduced, and *os* was able to receive outpatient treatment. *Os* was prescribed home therapy consisting of Ranitidine 2 × 150 mg *p.o.*, Citicoline 2 × 500 mg *p.o.*, Piracetam 2 × 800 mg *p.o.*, Mecobalamin 2 × 1 tablet *p.o.*, Levetiracetam 2 × 500 mg *p.o.*, Folic acid 1 × 1 tablet *p.o.*, Clopidogrel 1 × 75 mg *p.o.*, and Disolf 3 × 1 tablet *p.o.*

RESULTS AND DISCUSSIONS

Stroke is a clinical syndrome in the form of focal or global disturbance of brain function that develops rapidly and lasts >24 hours or causes death without a clear nonvascular cause (2). Stroke in children is defined as a cerebrovascular disorder that occurs between the ages of 30 days (1 month) and 18 years, in the form of clinical and radiological manifestations of stroke, with radiological evidence of cerebral infarction and hemorrhage. Another definition states that stroke in children is a stroke that occurs between the ages of 28 days after birth and 18 years. Stroke is divided into 2, namely ischemic stroke and hemorrhagic stroke. The most fundamental difference between stroke in children and stroke in adults is that the risk factors for stroke in children are very diverse. Common causes found are congenital heart disease, sickle cell disease, trauma, infection and prothrombin disorders. (3)

The most common symptoms of ischemic stroke are focal neurological deficits such as cranial nerve lesions, hemiparesis, and hemisensory loss (up to 94% of cases). Headaches occur in 30% of children. Seizures occur in 20–48% of cases and are a clinical manifestation of stroke at any age. Seizures can occur within the first 24 hours of onset and increase the risk of epilepsy in the following 6 months. In children over 5 years of age, more specific neurological symptoms include hemiparesis, aphasia, speech disorders, visual disturbances, and headache. Headaches can occur immediately before or immediately after the onset of paresis. If symptoms last less than 24 hours, it is called a Transient Ischemic Attack (TIA). In TIA, symptoms are often brief and resolve within 1 hour. Approximately 33% of children with arterial stroke have experienced a previous TIA that was not diagnosed at the time. (3,4)

In this case, OS presented with complaints of unconsciousness, having previously experienced prolonged seizures, headaches, and weakness in his right limbs. These symptoms are consistent with the common symptoms of stroke in children, namely hemiparesis. Approximately 20-48% experience seizures, and 30% of stroke patients experience headaches. Furthermore, the hemiparesis, which then resolved, suggests that OS had experienced an undiagnosed TIA.

The diagnosis of stroke in children is often delayed, as is the decision on therapy. A thorough medical history is crucial in determining the diagnosis of stroke in children. Difficulties in diagnosing stroke may arise in patients presenting with seizures. Seizures are more common in children with stroke than in adults. Misdiagnosis of stroke in children is significant because misdiagnosis of hemiparesis or aphasia is associated with postictal status. In some cases, the patient's symptoms upon arrival at the hospital may be mistaken for status epilepticus before a CT scan is performed. (3,5,6)

A CT scan is the first-line neuroimaging examination for acute neurological symptoms. A CT scan of the head without contrast is the gold standard for determining the type of stroke pathology, its location, and for ruling out non-vascular lesions. Magnetic resonance imaging (MRI), especially when combined with diffusion-weighted imaging (DWI) and perfusion-weighted imaging (PWI), is excellent for aiding stroke diagnosis. The disadvantage of MRI is that it requires a cooperative child or requires sedation. A CT scan, on the other hand, is easier and quicker to perform, even if the patient is unstable. A CT scan without contrast was performed on the patient's third day of treatment, which revealed an ischemic lesion. Since then, the patient's symptoms have been suggestive of an ischemic stroke. (3,7)

Therapy for ischemic stroke is generally supportive and requires intensive care. Oxygenation, fluid and electrolyte balance, seizures, and infection must be monitored. Anticoagulants are recommended for ischemic stroke. Warfarin is the most effective anticoagulant for long-term use in children. Low-dose aspirin is often used; many experts agree that aspirin is primarily intended for secondary prevention. Aspirin is given at a dose of 1-5 mg/kg/day. Clopidogrel can be given to patients who cannot take aspirin at a dose of 1 mg/kg/day. Heparin use should be limited to children at high risk for recurrent stroke and with a low risk of secondary bleeding. In OS, additional therapy is given by clopidogrel 75 mg once orally. (3,4,8)

The prognosis for stroke in children depends on the type of stroke, the location of the lesion, and the patient's age. After one month after the stroke, 60-80% of hemorrhagic stroke

patients survive, while 85-95% of ischemic stroke patients survive. Residual symptoms after a stroke, whether hemorrhagic or ischemic, include paresis, motor impairment, seizures, hemianopsia, language impairment, behavioral disturbances, and mental retardation. If seizures occur during an acute stroke, the prognosis is worse. (3,8,9)

CONCLUSION

This case report describes a 14-year-old male who presented with status epilepticus as the primary manifestation of acute ischemic stroke, a diagnosis initially obscured by the absence of obvious focal neurological deficits and the dramatic nature of the seizure presentation, despite a preceding history consistent with a transient ischemic attack serving as an unrecognized early clue. Diagnosis was ultimately confirmed on day three of hospitalization via non-contrast head CT scan, which revealed multiple ischemic lesions, underscoring the critical importance of maintaining a high index of clinical suspicion for stroke in pediatric patients presenting with atypical features, including new-onset seizures, to ensure timely neuroimaging and appropriate management for optimal neurological outcomes and prevention of recurrence. Future research should prioritize the development and validation of clinical decision tools to guide emergency clinicians in identifying children with new-onset seizures who warrant urgent neuroimaging, alongside prospective multicenter studies to better characterize the epidemiology, risk factors, and acute management strategies for pediatric stroke presenting with seizures, as well as investigations into long-term neurodevelopmental and epilepsy outcomes and the pathophysiological mechanisms underlying the pediatric brain's heightened susceptibility to post-stroke seizures, ultimately moving the field toward evidence-based guidelines that improve care for this vulnerable population.

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