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Migrainous Infarction in a 13-Year-Old Boy: A Rare Case of Complicated Childhood Migraine

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ABSTRACT

Introduction: Migrainous infarction is a rare but recognized complication of migraine with aura and is exceedingly uncommon in the pediatric population. Diagnostic uncertainty is frequent, as migraine in children is often perceived as a benign primary headache disorder.

Rationale: Early recognition of migrainous infarction in children is critical to prevent unnecessary investigations, delayed treatment, and long-term neurological morbidity. This case highlights the diagnostic challenges posed by prolonged and severe childhood migraine associated with radiological evidence of cerebral infarction.

Case Report: We report a 13-year-old boy with a five-year history of progressively worsening migraine-like headaches who presented with severe, disabling headache and vomiting. Neuroimaging revealed multiple small cerebral infarcts in the absence of vascular, metabolic, infectious, or autoimmune pathology. After comprehensive evaluation, a diagnosis of complicated migraine with migrainous infarction was made. The patient showed marked clinical improvement with migraine prophylaxis using flunarizine and sodium valproate.

Conclusion: This case underscores that migraine in children can be complicated by cerebral infarction even in the absence of focal neurological deficits. Persistent or worsening headaches in children warrant careful evaluation, and migrainous infarction should be considered once secondary causes are excluded.

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BACKGROUND

Migraine is a common primary headache disorder in childhood, with prevalence increasing with age and often associated with significant functional impairment. Although migraine with aura has been linked to ischemic stroke in adults, particularly young women, migrainous infarction remains rare overall and exceptionally uncommon in the pediatric population [1,2]. The International Classification of Headache Disorders defines migrainous infarction as a cerebral infarction occurring during a migraine attack with aura, with corresponding neuroimaging evidence and exclusion of other causes [3].

Children with complicated migraine may present with prolonged headaches, atypical features, or neuroimaging abnormalities that mimic secondary causes such as vasculitis, infection, or metabolic disorders, often leading to diagnostic delays [4]. Awareness of this rare entity is essential, as timely diagnosis can prevent unnecessary interventions and guide appropriate management [5].

CASE PRESENTATION

A 13-year-old boy from Bangladesh, previously well, presented with a long-standing history of severe headache that began at the age of eight years. Initially, the headaches were diffuse, severe, and prolonged, lasting 8–9 hours per episode and occurring two to three times per week. They were associated with photophobia and gradually increased in frequency and intensity over the years. Over the

preceding three to four months, the headaches had become more frequent and severe, accompanied by nausea and vomiting, ultimately leading to discontinuation of school activities due to disability.

He had previously been evaluated by pediatrician and otolaryngologist and was diagnosed with tonsillitis, for which he underwent tonsillectomy in November 2023, without improvement in headache symptoms. There was no history of trauma, fever, seizures, focal neurological deficits, or loss of consciousness. His past medical history was otherwise unremarkable. Family history was notable for migraine-like headaches in his mother, who also reported recurrent presyncopal episodes over the past decade.

On July 2025, he presented to the emergency department with severe headache and vomiting of 20 days' duration. A non-contrast CT scan of the brain revealed a small hypodense lesion in the right frontal lobe adjacent to the frontal horn of the right lateral ventricle, suggestive of infarction. A repeat CT scan performed on late July showed similar findings. Subsequent MRI of the brain on August demonstrated a tiny old infarct in the right cerebral hemisphere.

Further evaluation in the neurology outpatient department on September included MRI of the brain with magnetic resonance spectroscopy, which revealed multiple small discrete signal intensity changes in the subcortical, periventricular, and deep white matter regions of both cerebral hemispheres. These lesions were hypointense on T1-weighted images and hyperintense on T2-weighted and FLAIR sequences, without diffusion restriction or susceptibility blooming. Tiny cerebrospinal fluid signal intensity areas with surrounding mild gliosis were also noted. MR spectroscopy showed no lactate or lipid peaks, with preserved N-acetyl aspartate (NAA), choline, and creatine ratios. The radiological impression was multiple tiny infarcts.

Electroencephalography was normal. Magnetic resonance angiography revealed no vascular abnormalities. Laboratory investigations, including complete blood count, electrolytes, liver, renal, and thyroid function tests, creatine phosphokinase, and plasma lactate levels, were within normal limits. Cerebrospinal fluid analysis showed mildly elevated protein (60 mg/dL) with normal cell count and glucose; infectious workup including GeneXpert, ADA, and multiplex PCR panel was negative. Autoimmune markers including ENA panel, C-ANCA, and P-ANCA were negative. Neurological examination and fundoscopy were unremarkable.

After exclusion of secondary causes of pediatric stroke, the patient was diagnosed with complicated migraine with migrainous infarction. He was started on flunarizine 10 mg nightly and sodium valproate 200 mg twice daily, with excellent clinical response. At follow-up, he was headache-free and had resumed normal daily activities and attending school without any complication.

DISCUSSION

Migrainous infarction represents a rare but important complication of migraine, accounting for a small proportion of ischemic strokes in young individuals [1]. While the association between migraine with aura and stroke is well established in adults, pediatric cases are scarce and largely limited to isolated case reports and small series [6,7]. The proposed mechanisms include cortical spreading depression–induced hypoperfusion, endothelial dysfunction, platelet aggregation, and transient vasoconstriction [2,8].

In children, diagnosis is particularly challenging due to the variable presentation of migraine, frequent absence of aura, and the rarity of stroke in this age group [4]. In the present case, the absence of focal neurological deficits and normal vascular imaging further complicated the diagnostic process. The presence of multiple small infarcts on MRI, along with a strong migraine phenotype and exclusion of alternative etiologies, supported the diagnosis of migrainous infarction.

The family history of migraine in the patient's mother suggests a possible genetic predisposition, consistent with previous studies demonstrating familial clustering of migraine and migraine-related stroke [9]. Early recognition is crucial, as appropriate migraine prophylaxis has been shown to reduce recurrence and improve quality of life [5,10].

Learning Points

- Migraine in children is not always a benign condition and can be associated with serious neurological complications, including cerebral infarction.
- Persistent, severe, or progressively worsening headache in children warrants thorough evaluation, even in the absence of focal neurological deficits.
- Migrainous infarction should be considered in pediatric patients with compatible clinical features and unexplained cerebral infarcts after exclusion of secondary causes.

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