

Stroke as First Presentation of Rheumatic Heart Disease in Pediatric Age Group – a Case Report from Developing Country, Rwanda

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Background: Rheumatic heart disease (RHD), a chronic consequence of acute rheumatic fever, rarely presents with stroke as an initial manifestation in children. This report shows a rare scenario where ischemic stroke was the first clinical presentation of underlying RHD.

Case Presentation: A 10-year-old boy presented with seizures, hemiplegia, and expressive aphasia. Echocardiography revealed rheumatic mitral valve disease with a vegetation. Neuroimaging showed multifocal cerebral infarctions suggestive of cardioembolism.

Conclusion: This case emphasizes the importance of echocardiographic screening in pediatric patients presenting with stroke, particularly in endemic regions where subclinical RHD may go undiagnosed.

Keywords: rheumatic heart disease, pediatric stroke, cardioembolism, subclinical RHD

Introduction

Rheumatic heart disease (RHD) remains a leading cause of acquired heart disease in children, especially in low- and middle-income countries. It typically results from repeated episodes of acute rheumatic fever (ARF), leading to chronic valvular damage, most commonly affecting the mitral and aortic valves. Although stroke is a recognized complication of RHD, it is rarely the presenting symptom in pediatric patients.

In general, pediatric stroke though less common than adult stroke, represents a significant cause of morbidity and mortality worldwide, with disproportionately higher burden, delayed diagnosis, and limited access to specialized care in low- and middle-income countries, particularly across Africa. Embolic stroke in this setting may arise from intracardiac thrombi or vegetations on damaged valves, even in the absence of overt clinical signs of carditis or ARF.

The pathophysiology involves cardioembolic stroke secondary to valvular damage and atrial fibrillation, both common complications of advanced RHD. Patients may present with sudden-onset neurological deficits such as hemiparesis, facial droop, or speech disturbances, without any prior known history of cardiac symptoms. In such scenarios, echocardiography is a vital diagnostic tool, revealing valvular lesions, chamber enlargement, or evidence of embolic sources. Other investigations include neuroimaging and workup for infective endocarditis if fever or vegetations are present.^{1–3}

Case Presentation

A previously healthy 10-year-old boy presented with a one-week history of altered mentation and abnormal body movements. His illness began with a frontal headache managed symptomatically at a local clinic. Two days later, he developed focal seizures affecting the left upper and lower extremities, lasting approximately three minutes. Though he regained consciousness, his symptoms progressed over the next few days, with recurrent seizures, speech difficulties, and

left-sided weakness. He was evaluated at a district hospital, where he received intravenous antibiotics but showed no improvement and was subsequently referred for specialized care.

Examination Findings

On admission, he was hemodynamically stable. His Glasgow Coma Scale (GCS) score was 10, and he demonstrated expressive aphasia. A grade 2/6 Holo-systolic murmur was auscultated at the apex. Neurologically, the patient exhibited left-sided hemiplegia (muscle power 1/5), hypertonia, clonus, reduced sensation, and a positive Babinski sign. Pupils were bilaterally equal, round, and reactive to light, with no cranial nerve deficits.

Investigations Summary

Blood Investigations

Full blood count, C-reactive protein and Blood cultures did not indicate evidence of an acute infectious process.

Echocardiography demonstrated markedly dilated left heart chambers, rheumatic changes of the anterior mitral valve leaflet, and moderate to severe mitral regurgitation. A hyper-echoic, oscillating mass measuring 5×6 mm is noted attached to posterior mitral leaflet, suggestive of old vegetation and good ventricular systolic function (Figure 1).

Neuroimaging findings included a CT scan showing left frontal and insular cortical hyperdensity with surrounding minimal subcortical hypoattenuation, and an area of relative hyperattenuation in the right middle cerebral artery (MCA) territory (Figure 2). MRI of the brain revealed acute infarction in the right fronto-parietal and insular regions, with subacute infarcts in the left frontal and insular lobes (Figures 3 and 4). The overall impression was multifocal cerebral infarctions, consistent with a cardioembolic source.

Hospital Course

The patient's seizures were initially managed with diazepam and then controlled with phenytoin, which remains ongoing. Anticoagulation with subcutaneous heparin was initiated and later continued to receive aspirin. Physiotherapy also initiated. Notably, he has shown improvement in motor function of the left limbs and is now able to speak a few words. Later the patient has continued follow up at pediatric neurology and cardiology clinics.

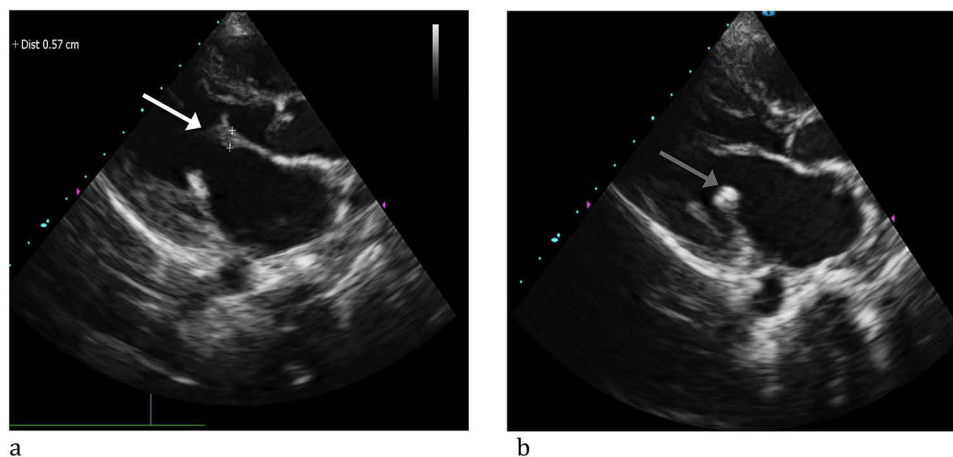


Figure 1 (a) Thickening of the tip of anterior mitral leaflet (white arrow). (b) Hyper-echoic mass attached to the posterior mitral leaflet (black arrow).



Figure 2 CT image: Left frontal and insular cortical hyperdensity with surrounding hypodensity (black arrow); and an area of relative hypodensity in the right fronto-parietal area (white arrow).

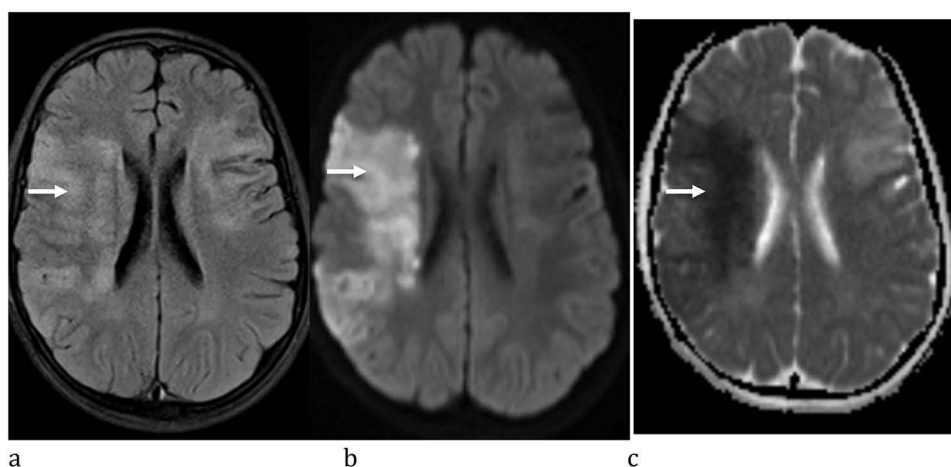


Figure 3 Brain MRI showing involvement of the right fronto-parietal and temporal regions, including the right insular lobe (white arrows). FLAIR sequence (a) demonstrates hyperintensity in the affected areas. Corresponding DWI (b) and ADC (c) maps reveal restricted diffusion, consistent with acute infarction.

Discussion

This case exemplifies an unusual presentation of pediatric ischemic stroke due to RHD-related cardioembolism. The presence of a mitral valve vegetation and multifocal infarcts in various stages (acute and subacute) strongly support the diagnosis. The absence of classic ARF manifestations such as fever, arthritis, or chorea, and the lack of known prior cardiac disease, reflect how RHD can remain clinically silent until severe complications arise.

The dual-phase infarcts observed on MRI (acute and subacute) suggest recurrent embolic events. Echocardiography was crucial in revealing the underlying pathology. In this patient, the disease likely evolved silently over time (subclinical), only becoming clinically evident after a catastrophic embolic event following superimposed infective endocarditis.

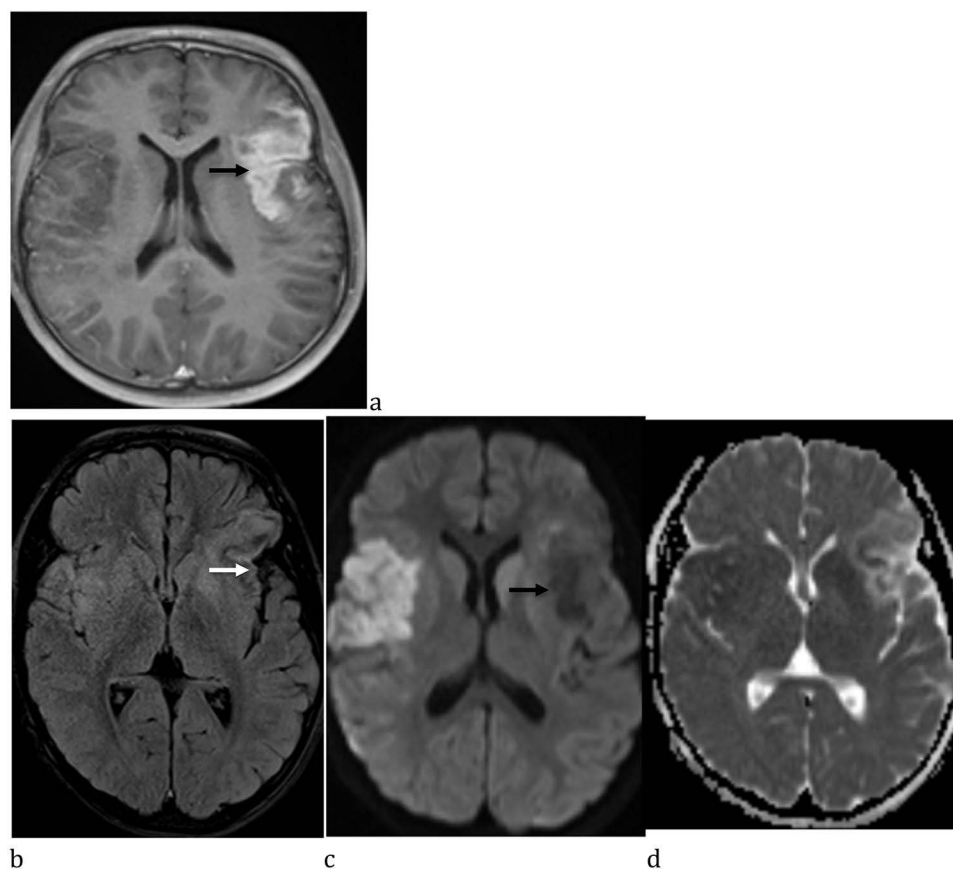


Figure 4 Axial brain MRI images demonstrating left frontal lobe pathology. (a) T1-weighted image showing an area of hypointensity in the left frontal lobe (black arrow). (b) FLAIR image demonstrating hyper-intense signal changes involving the left frontal and insular lobes (white arrow). (c) Diffusion-weighted image (DWI) showing corresponding areas of facilitated diffusion (black arrow). (d) Apparent diffusion coefficient (ADC) map confirming facilitated diffusion in the same region.

Subclinical RHD—defined as echocardiographic evidence of valvular disease in asymptomatic individuals—is increasingly recognized in endemic areas.^{2,3} Studies report prevalence up to 10 times higher when systematic echocardiographic screening is used compared to clinical detection alone.² The only clinical clue in this child was a systolic murmur, emphasizing the need for high suspicion and routine screening in endemic populations.

The multifocal nature of the infarcts indicates ongoing embolic events, likely originating from the mitral vegetation. Prompt recognition and initiation of secondary prophylaxis can prevent recurrence and reduce long-term morbidity.^{4,5}

Limitation

Additional advanced imaging, such as MRI angiography, would have provided further valuable diagnostic evidences.

Conclusion

RHD complicated with infective endocarditis may initially present as ischemic stroke because of embolised vegetation in children, especially in endemic regions where subclinical disease often goes undetected. Echocardiography is essential in the evaluation of pediatric stroke to identify potential cardiac sources. This case underscores the importance of integrating cardiac and neurological assessment in pediatric stroke management and the value of echocardiographic screening in high-risk populations.

Consent for Publication

No institutional approval is required for case report publication. But the child's parents have provided full, informed, and written consent for the inclusion of case-related information concerning their child in this article submitted for publication.

Disclosure

The authors report no conflicts of interest in this work.

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