CARDIOLOGIE TUNISIENNE

CASE REPORT

Hemorrhagic Stroke From Ruptured Mycotic Aneurysm in a Child With Subvalvular Aortic Stenosis and Infective Endocarditis

Accident vasculaire hémorragique suite à la rupture d'un anévrysme mycotique chez un enfant avec une sténose aortique sous-valvulaire et une endocardite infectieuse

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Summary

Infective endocarditis (IE) is a potentially life-threatening condition in children, particularly those with congenital heart disease. Neurological complications, such as hemorrhagic stroke from ruptured mycotic aneurysms, are rare but carry high morbidity. We describe a 10-year-old boy with known subvalvular aortic stenosis who presented with fever and acute right-sided hemiparesis. Neuroimaging revealed intracerebral and meningeal hemorrhage with features consistent with mycotic aneurysms. Transthoracic echocardiography demonstrated a mobile vegetation on the aortic valve, and blood cultures identified methicillin-sensitive Staphylococcus aureus. Targeted intravenous antibiotics and antiepileptic therapy were initiated, resulting in gradual neurological improvement and complete resolution of the cardiac vegetation. At one-year follow-up, persistent mild neurological deficits remained, and the patient underwent surgical resection of the subvalvular membrane. This case underscores the need for early recognition of neurological complications in paediatric IE and the value of prompt, coordinated multidisciplinary care.

Keywords

Infective endocarditis, Mycotic aneurysm ,Hemorrhagic stroke, Pediatric cardiology, Subvalvular aortic stenosis

Résumé

L'endocardite infectieuse (EI) est une affection potentiellement mortelle chez l'enfant, en particulier chez ceux atteints de cardiopathie congénitale. Les complications neurologiques, telles que l'accident vasculaire cérébral hémorragique par rupture d'anévrisme mycotique, sont rares mais associées à une morbidité importante. Nous décrivons le cas d'un garçon de 10 ans présentant un rétrécissement aortique sous-valvulaire connu, admis pour fièvre et hémiparésie droite aiguë. L'imagerie cérébrale a révélé une hémorragie intracérébrale et méningée avec des caractéristiques compatibles avec un anévrisme mycotique. L'échocardiographie transthoracique a mis en évidence une végétation mobile sur la valve aortique, et les hémocultures ont identifié un Staphylococcus aureus sensible à la méthicilline. Un traitement antibiotique intraveineux ciblé et un traitement antiépileptique ont été instaurés, entraînant une amélioration neurologique progressive et la disparition complète de la végétation cardiaque. Un an après l'intervention, de légers déficits neurologiques persistaient, et le patient a eu une résection chirurgicale de la membrane sous-valvulaire. Ce cas souligne l'importance d'un diagnostic précoce des complications neurologiques de l'endocardite infectieuse chez l'enfant et l'intérêt d'une prise en charge multidisciplinaire rapide et coordonnée.

Mots-clés

Endocardite infectieuse, Anévrisme mycotique, Accident vasculaire cérébral hémorragique, Cardiologie pédiatrique, Sténose aortique sous-valvulaire

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INTRODUCTION

Infective endocarditis (IE) in children is uncommon, with an estimated incidence of 0.3–0.8 per 100,000 children per year, but it is associated with significant morbidity and mortality, particularly in those with underlying congenital heart disease (CHD) (1-4).

Neurological complications occur in approximately 20–40% of paediatric IE cases and include ischaemic stroke, intracranial haemorrhage, brain abscess, and mycotic aneurysm formation (5,6). Haemorrhagic stroke secondary to rupture of a mycotic aneurysm is rare but is among the most severe and life-threatening complications (6). Staphylococcus aureus is the most frequently implicated pathogen and is associated with a higher risk of embolic and neurological events (2,7).

Early diagnosis, based on clinical suspicion, echocardiography, blood cultures, and neuroimaging, is essential to optimise outcomes. We report a paediatric case of haemorrhagic stroke as the initial manifestation of Staphylococcus aureus infective endocarditis in a child with subvalvular aortic stenosis.

CASE REPORT

Case History and Clinical Examination

A 10-year-old boy was admitted to the emergency department with acute right-sided hemiparesis accompanied by fever and headache. He had a known history of subvalvular aortic stenosis, diagnosed at age eight, for which surgical correction was planned. There was no prior history of infective endocarditis.

Investigations and Diagnosis

Laboratory investigations showed leukocytosis (25,820/mm^3) with marked neutrophilia (22,720/mm^3) and elevated C-reactive protein (246 mg/dl). Liver and renal function tests, including serum electrolytes, were within normal limits. Blood cultures grew methicillin-susceptible Staphylococcus aureus.

Emergency brain computed tomography (CT) revealed diffuse cerebral edema, meningeal hemorrhage, and two hemorrhagic lesions in the supratentorial region with surrounding edema. Magnetic resonance imaging (MRI) confirmed a non-surgical left frontal hematoma, low-volume subarachnoid and meningeal hemorrhage, and multiple supra- and infratentorial microbleeds. Contrast-enhanced sequences demonstrated small enhancing lesions in the right superior frontal sulcus, consistent with mycotic aneurysms. (Figure1)

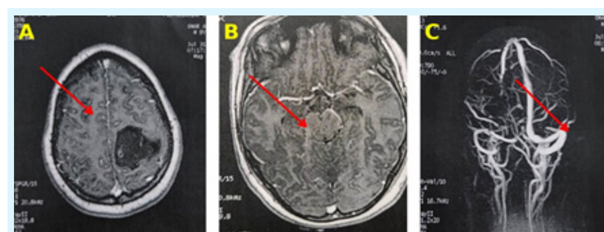

Figure 1. Brain MRI and MR angiography findings in infective endocarditis with suspected mycotic aneurysm.

(A) Three-dimensional time-of-flight MR angiography (TOF-MRA) demonstrating irregular focal dilatations of distal cerebral arterial branches, suggestive of infectious (mycotic) aneurysms.

(B) Axial T1-weighted brain MRI showing a left frontal intraparenchymal hematoma with surrounding vasogenic edema.

(C) Axial contrast-enhanced T1-weighted MRI demonstrating meningeal enhancement and inflammatory changes, compatible with intracranial complications of infective endocarditis

Transthoracic echocardiography showed a 7-mm mobile vegetation in the left ventricular out flow tract, attached to the aortic valve.

As part of the work-up for the extension of infective endocarditis, a thoraco-abdomino-pelvic CT scan revealed a focal splenic infarction with a small splenic effusion and localized nephritis, consistent with systemic embolic phenomena.

Management

Empirical intravenous antibiotic therapy with ampicillin, oxacillin, and gentamicin was initiated to provide broad coverage against the most common pathogens causing pediatric infective endocarditis, including Staphylococcus aureus, streptococci, and enterococci, and was subsequently adjusted to oxacillin and ciprofloxacin based on antimicrobial susceptibility results.

Anticoagulation therapy was withheld due to the presence of intracranial hemorrhage associated with a ruptured mycotic aneurysm and the diagnosis of Staphylococcus aureus infective endocarditis, both conditions in which anticoagulation may increase the risk of further intracranial bleeding.

A conservative management approach was adopted due to the patient's hemodynamic and neurological stability, and the intracerebral hematoma was deemed non-surgical.

The clinical course was complicated by recurrent epileptic seizures, which were controlled with levetiracetam and phenobarbital.

Outcome and Follow-Up

The patient exhibited progressive clinical improvement. Fever resolved after approximately 10 days of treatment, follow-up blood cultures were negative, and inflammatory markers gradually normalized. Serial echocardiography revealed complete resolution of the cardiac vegetation, while follow-up brain MRI showed partial regression of the cerebral hematoma and stable mycotic aneurysms, further supporting the decision

to continue conservative management. Intravenous antibiotic therapy was maintained for a total of six weeks.

At one-year follow-up, neuroimaging confirmed complete resolution of the hematoma, with only minimal residual neurological deficits. The patient subsequently underwent successful surgical resection of the subvalvular aortic membrane, with a favorable postoperative course.

DISCUSSION

Mycotic aneurysms are rare but serious complications of infective endocarditis (IE), which may result from septic embolization or direct microbial invasion of the arterial wall. Although more frequently described in adults, they can occur in children, particularly in association with left-sided IE and congenital heart disease (3,6).

Neurological manifestations may be the presenting feature of IE in children, sometimes preceding the cardiac diagnosis (5,6,8). In pediatric IE, Staphylococcus aureus is strongly associated with embolic phenomena and intracranial complications, including hemorrhagic stroke (2,6,8). Brain MRI with vascular sequences plays a key role in identifying cerebral hemorrhage, microbleeds, and lesions suggestive of mycotic aneurysms, there by guiding therapeutic decisions (6,8).

Management relies primarily on prolonged, targeted intravenous antibiotic therapy (1,9). Surgical or endovascular treatment of mycotic aneurysms in children remains controversial and is generally reserved for cases with persistent bleeding, enlarging aneurysms, or failure of medical therapy (6,9).

In a recent retrospective study, Giraudo et al. reported that ruptured intracranial infectious aneurysms (IIAs) carry a high risk of rerupture, and early surgical or endovascular intervention should be considered when feasible to prevent recurrent hemorrhage (10).

In our patient, a conservative approach, consisting of prolonged targeted intravenous antibiotic therapy with close radiological and neurosurgical monitoring, was adopted due to the patient's hemodynamic and neurological stability and the non-surgical nature of the intracerebral hematoma.

CONCLUSION

This case underscores the importance of considering infective endocarditis and its potential neurological complications in febrile children with congenital heart disease presenting with acute neurological deficits. Early implementation of multimodal imaging, prompt microbiological diagnosis, and initiation of targeted antibiotic therapy are essential for improving prognosis and minimizing long-term sequelae. Furthermore, a multidisciplinary approach involving pediatric cardiology, neurology, infectious diseases, and radiology is crucial to optimizing outcomes in children with complicated infective endocarditis.

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