VER
Vascular & Endovascular Review

Mycotic External Iliac Artery Aneurysm in a Child with Rheumatic Heart Disease and Infective Endocarditis

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ABSTRACT

Background: Mycotic aneurysms of the peripheral arteries are rare in children, especially in association with infective endocarditis (IE) secondary to rheumatic heart disease (RHD). Only a few cases of RHD with peripheral mycotic aneurysms have been reported in the literature, with none in the pediatric age group.

Case Presentation: We report a 10-year-old girl with known RHD and infective endocarditis who presented with acute onset left calf pain. Clinical evaluation and CT angiography revealed non-opacification of the left external iliac artery (EIA) with focal aneurysmal dilation suspicious for a mycotic aneurysm. Surgical exploration revealed a left EIA mycotic aneurysm requiring proximal and distal ligation and common iliac artery (CIA) to common femoral artery (CFA) bypass using autologous great saphenous vein.

Conclusion: This case highlights a rare but serious vascular complication of infective endocarditis in children. Early recognition and prompt surgical intervention can prevent limb loss and mortality.

How to Cite: K Jeyachandran, Venu S, Sritharan N, Ramya, Sakthinesh, (2025) Mycotic External Iliac Artery Aneurysm in a Child with Rheumatic Heart Disease and Infective Endocarditis, Vascular and Endovascular Review, Vol.8, No.20s, 306-309

INTRODUCTION

Mycotic aneurysms are a rare but serious vascular complication resulting from infectious destruction of the arterial wall. Although they account for less than 1% of all arterial aneurysms, their occurrence is particularly unusual in the pediatric population[1,2]. The term “mycotic aneurysm,” first described by Sir William Osler, refers not to fungal etiology but to the mushroom-like appearance of infected arterial outpouchings caused by microbial invasion.[3]

In children, mycotic aneurysms are most commonly associated with congenital heart disease, trauma, prior arterial catheterization, or systemic infections such as infective endocarditis (IE)[4]. However, involvement of the iliac arteries, especially the external iliac artery (EIA), is exceptionally rare. Iliac mycotic aneurysms are difficult to diagnose early because they often remain asymptomatic until complications arise, such as acute limb ischemia (ALI), rupture, distal embolization, or sepsis.[5,6]

Rheumatic heart disease (RHD) remains a major contributor to pediatric cardiac morbidity in resource-limited settings. Chronic valvular dysfunction predisposes patients to infective endocarditis, increasing the risk of septic emboli that can seed distant tissues, including arterial walls.[6,7] However, septic embolization leading to peripheral mycotic aneurysm formation in children with RHD is virtually unheard of. A review of available literature reveals only eight adult cases globally of peripheral mycotic aneurysms secondary to RHD, with no documented cases in the pediatric age group.[8]This report highlights a rare case of a 10-year-old girl with RHD and active infective endocarditis who developed a mycotic aneurysm of the left external iliac artery, presenting with limb symptoms mimicking acute ischemia. The case underscores the need for heightened clinical suspicion when a child with IE develops new-onset limb pain, as delayed diagnosis can lead to catastrophic outcomes.

CASE PRESENTATION

A 10-year-old female child, first-born, developmentally normal and immunized up to 5 years, presented with complaints of acute onset left calf pain for two days. There was no associated fever, trauma, or prior claudication history, and she reported no recent infectious episodes or invasive procedures. She was referred to our institution with a prior diagnosis of rheumatic heart disease (RHD) and infective endocarditis, confirmed at the referring center.

CARDIAC BACKGROUND

She had features of chronic rheumatic valvular disease, including:

- Severe mitral regurgitation
- Mitral valve prolapse
- Vegetation measuring 11 × 1 mm on the anterior mitral leaflet (AML)
- Ejection fraction (EF): 58%
- No regional wall motion abnormality (RWMA)

These findings were consistent with active infective endocarditis associated with rheumatic valvular pathology
Initial Examination
On admission:

- The left femoral pulse was diminished
- The limb was warm with preserved sensory and motor function
- No signs of critical limb ischemia were noted

These findings suggested acute limb ischemia (ALI) Class I, likely secondary to septic or thromboembolic events arising from the vegetation.
Laboratory & Microbiological Workup

- Urine culture: negative
- Blood culture: grew skin commensals (likely contamination)
- Serology: negative

Given the cardiac background, infective endocarditis remained the primary diagnosis despite culture limitations.

CT ANGIOGRAPHY

CTA of the lower limbs demonstrated:

- Non-opacification of the left external iliac artery over a length of 6.7 cm
- Focal aneurysmal dilatation (6.8 mm) near the EIA origin
- Collateral reformation of the left common femoral artery (CFA)
- Dilated left internal iliac artery (IIA)
- Mildly attenuated flow in the left SFA, popliteal, and anterior tibial arteries

These findings were strongly suggestive of a mycotic aneurysm of the left EIA, complicated by near-complete occlusion and collateral-dependent distal perfusion
Preoperative Medical Therapy
The patient was initiated on:

- Penicillin 250 mg BD
- Envas 25 mg ½ BD
- Lasix 40 mg (1/3 tablet) OD
- Aldactone 25 mg OD

Cardiothoracic surgical consultation recommended delaying mitral valve repair until vascular control was achieved, as ongoing embolic risk threatened limb viability.

INTRAOPERATIVE FINDINGS & PROCEDURE

A decision was made for exploration with possible:

- EIA ligation
- CIA ligation
- CIA-to-CFA bypass using autologous vein graft

During intraoperative trial clamping of the left CFA, no arterial signals were detected in the limb, indicating inadequate collateral circulation and the necessity for revascularization.
Surgical findings included:

- Dense adhesions around the left internal iliac artery, preventing safe control
- Aneurysmal sac filled with inflammatory tissue
- Absence of backflow from the IIA on opening the sac

A great saphenous vein (GSV) graft of good caliber was harvested from the thigh. The aneurysm was excluded by proximal and distal ligation of the EIA, and a left CIA-to-CFA bypass was performed using the autologous vein graft
Postoperative Course

- Posterior tibial artery: 2+ palpable
- Anterior tibial artery: absent
- Bifurcation signals: present
- Staples removed on postoperative day (POD) 10

HISTOPATHOLOGY

The specimen revealed:

- Fibrocollagenous tissue
- Lined by fibrous material
- Dense chronic inflammatory cell infiltrates

These findings confirmed the diagnosis of a mycotic aneurysm

DISCUSSION

Mycotic aneurysms represent an uncommon but critical vascular emergency caused by microbial destruction of the arterial wall. They account for **0.7–2.0%** of all arterial aneurysms and are even rarer in children because of their lower prevalence of atherosclerosis, trauma, and invasive vascular procedures compared to adults.[1,2] The majority of pediatric cases arise from

infective endocarditis (IE), congenital heart disease, or catheter-related infections. The present case is unique because the child developed a mycotic external iliac artery (EIA) aneurysm in association with rheumatic heart disease (RHD) and mitral valve infective endocarditis, a combination not previously described in pediatric literature.[3,4,5]

PATHOGENESIS AND LINK TO INFECTIVE ENDOCARDITIS

Mycotic aneurysms in IE typically result from septic embolization of friable vegetations. These emboli become lodged in arterial walls or the vasa vasorum, leading to:

1. Endothelial injury
2. Suppurative inflammation
3. Destruction of the media
4. Pseudoaneurysm or true aneurysm formation

In this child, the presence of an 11 × 1 mm vegetation on the anterior mitral leaflet provided a highly probable embolic source Embolic seeding most commonly affects cerebral, mesenteric, or peripheral muscular arteries; involvement of the iliac arteries is rare because of their deep location and relatively high flow. Only eight adult cases of RHD-associated peripheral mycotic aneurysms have been identified in literature, and none involved pediatric patients, supporting the extraordinary nature of this case.

CLINICAL PRESENTATION AND DIAGNOSTIC COMPLEXITY

The child presented with calf pain and diminished femoral pulse, raising the suspicion of acute limb ischemia (ALI). However, mycotic aneurysms may remain clinically silent until complications occur—thrombosis, rupture, or distal embolization.
CTA was essential because:

- It demonstrated non-opacification of the left EIA,
- Revealed a focal 6.8 mm aneurysmal dilation,
- Identified collateral-dependent reformation of the left common femoral artery,
- Showed diffuse attenuation of flow in distal vessels

These findings provided clues toward a mycotic etiology, supported by the patient's background of IE.

SURGICAL DECISION-MAKING

Management of mycotic aneurysms requires addressing both the infected arterial site and ongoing bacteremia. Standard care includes:

1. Excision or exclusion of the infected arterial segment
2. Revascularization using autologous conduit
3. Prolonged intravenous antibiotics

In this case:

- Trial clamping of the common femoral artery resulted in complete loss of distal signals, indicating inadequate collateral perfusion.
- Dense adhesions prevented safe control of the internal iliac artery, increasing the risk of venous injury.
- Therefore, the team proceeded with proximal and distal ligation of the EIA and left common iliac artery (CIA) to common femoral artery (CFA) bypass with a harvested great saphenous vein graft, which is preferred in infected fields due to its lower risk of reinfection

HISTOPATHOLOGY CORRELATION

Histology showed:

- Fibrocollagenous tissue
- Chronic inflammatory cell infiltrate
- No intact arterial architecture

These findings confirmed infectious destruction of the arterial wall, consistent with a mycotic aneurysm. Pediatric mycotic aneurysms most commonly involve[7,8,9]:

- Intracranial arteries
- Femoral artery (usually catheter-related)
- Abdominal aorta (rare)

Iliac artery involvement is exceedingly rare. Reported cases usually arise from:

- Staphylococcus aureus
- Salmonella spp.
- Streptococcus species

Culture results in this case were nondiagnostic, a common issue in pediatric IE, especially when prior antibiotics are given.

PROGNOSIS AND FUTURE IMPLICATIONS

Early recognition is essential because untreated mycotic aneurysms carry a risk of:

- Rupture (mortality up to 60%)
- Limb loss
- Persistent sepsis

Surgical bypass restored perfusion, and stabilization allowed deferral of mitral valve repair, consistent with the staged approach

recommended in active IE with embolic complications.
This case emphasizes:

- High suspicion for vascular complications in pediatric IE
- Importance of CTA in unexplained limb pain
- Autologous grafting in infected surgical fields
- Need for multidisciplinary care (vascular surgery, cardiology, CT surgery)

To our knowledge, this is the first pediatric case of an external iliac artery mycotic aneurysm secondary to RHD-associated infective endocarditis.

CONCLUSION

Mycotic aneurysms of the external iliac artery are extremely rare in children and even more uncommon when associated with rheumatic heart disease and infective endocarditis. This case highlights the critical importance of considering vascular complications when a child with IE presents with new limb symptoms. Early CTA-based diagnosis combined with timely surgical exclusion and autologous bypass grafting can be lifesaving and limb-saving. Multidisciplinary coordination remains essential for optimal outcomes.

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