Ruptured Mitral Annular Abscess with Severe Mitral Regurgitation in a Child

Bhuwan Thapa[1], Naveen Kumar Pandey[1], Subhash Chandra Mandal[2], Ramesh Sapkota[1]

[1]Department of Cardiology, BPKIHS, Dharan, Nepal

[1]Department of Surgery, BPKIHS, Dharan, Nepal

ABSTRACT

Infective endocarditis (IE) in children is rare but can present with devastating complications. Staphylococcus aureus is an aggressive pathogen that can lead to valvular destruction, annular abscess formation, and rupture, resulting in severe mitral regurgitation and hemodynamic compromise. We report the case of a 14-year-old child from a remote village in Eastern Nepal, who presented with pleuritic chest pain for 2 days, progressive dyspnea (NYHA I-IV) for 7 days, and persistent fever for 15 days. The patient had undergone incision and drainage for a Staphylococcus aureus thigh abscess 10 days earlier and had been on empirical antibiotics since then. On examination, he was tachypneic, tachycardic, and maintaining oxygen saturation with 4L/min via nasal prongs. A high-pitched, grade V/VI systolic murmur was heard over the apex, radiating to the axilla, along with a pericardial rub. Blood cultures were sterile, likely due to prolonged antibiotic use. ECG showed sinus tachycardia with ST elevation and PR depression in all leads except aVR, suggestive of pericarditis. Chest X-ray was normal. Transthoracic echocardiography (TTE) revealed severe mitral regurgitation with a ruptured abscess cavity involving the posterior mitral leaflet and annulus, fistulating into the left atrium. This case highlights the aggressive nature of Staphylococcus aureus infections, leading to annular abscess formation and rupture in a previously healthy child. Early suspicion, prompt echocardiographic assessment, and surgical intervention are crucial for survival. Prolonged empirical antibiotic use may obscure microbiological diagnosis, delaying definitive treatment.

KEY WORDS

Infective endocarditis, mitral annular abscess, Staphylococcus aureus, mitral regurgitation, pediatric endocarditis

*Corresponding Author |
Dr. Bhuwan Thapa, MBBS,MD
DM Cardiology Resident, Department of Cardiology, BPKIHS,
Dharan-18, Sunsari, Koshi Province, Nepal
Email: drbhuwan1991@gmail.com

INTRODUCTION

Infective endocarditis (IE) in children is uncommon but carries high morbidity, particularly when caused by Staphylococcus aureus, a pathogen associated with rapid valvular destruction, perivalvular abscess, and systemic embolization . Annular abscess rupture into the left atrium is a rare and life-threatening complication. This case underscores the importance of early diagnosis and surgical intervention in S. aureus-related IE, especially in resource-limited settings[2,3,4]

CASE PRESENTATION

Patient History and Presentation

A 14-year-old child from a remote village in Eastern Nepal was referred by an orthopedic surgeon for evaluation of cardiac symptoms. The child had:

I. A thigh abscess caused by Staphylococcus aureus, treated with incision and drainage (I&D) on postoperative day 10.

II. Persistent fever for 15 days despite antibiotic therapy.

III. Progressive shortness of breath (NYHA class I-class IV) for 7 days.

IV. Pleuritic, central chest pain for 2 days.

Despite ongoing empirical antibiotics, fever persisted, prompting further evaluation.

Physical Examination

I. General Condition: Ill-appearing, tachypneic, and tachycardic.

II. Cardiovascular Findings:

Soft first heart sound (S1), normal second heart sound (S2).

High-pitched, blowing, grade V/VI intensity, early-to-mid systolic murmur at the apex, radiating to the axilla.

Pericardial rub present.

No clinical stigmata of infective endocarditis (Osler's nodes, Janeway's lesions, splinter hemorrhages, or Roth's spots).

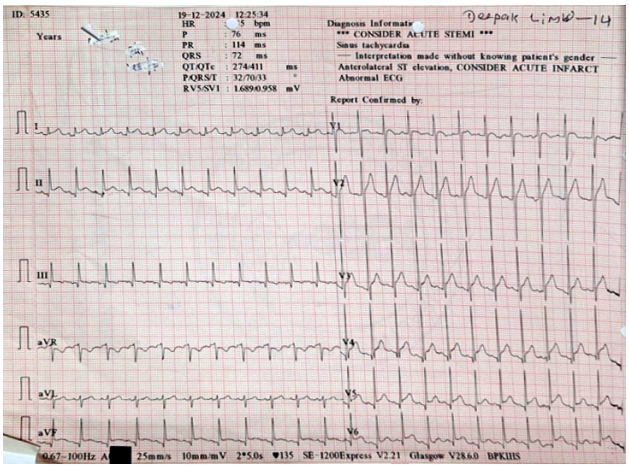
Investigations

I. Blood Cultures: Sterile (likely due to prolonged antibiotic use).

II. Pus Culture from thigh abscess: Staphylococcus aureus isolated.

III. ECG: Sinus tachycardia.

ST elevation and PR depression in all leads except aVR suggestive of pericarditis3.



Picture-1: 12 lead ECG showing features of acute pericarditis

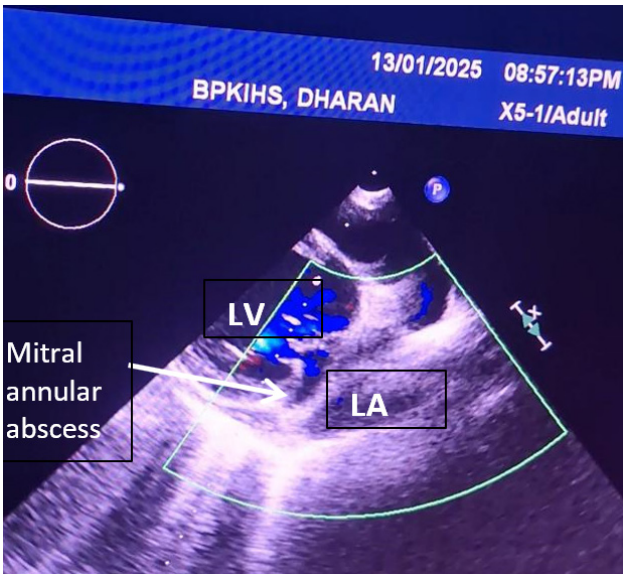
IV. Chest X-ray: Normal.

V. Transthoracic Echocardiography (TTE):

Severe mitral regurgitation.

Ruptured abscess cavity involving the posterior mitral leaflet and annulus, fistulating into the left atrium.

No vegetations or thrombi noted.



Picture-2: Parasternal long axis view with colour doppler (2D echocardiogrpahy) showing mitral annular abscess.

Diagnosis

Based on clinical, echocardiographic, and laboratory findings, the diagnosis of ruptured mitral annular abscess with severe mitral regurgitation due to Staphylococcus aureus bacteremia (likely secondary to a deep soft tissue infection) was made.

Management[5,6,7]

1. Medical Therapy

I. Empirical IV Antibiotics (adjusted per sensitivity, given sterile cultures):

a) Vancomycin + Gentamicin (covering MRSA and MSSA)[7,8]

b) Diuretics (Furosemide): For pulmonary congestion.

c) Supportive Care: Oxygen therapy and monitoring.

2. Surgical Intervention

Given severe mitral regurgitation with abscess rupture into the left atrium, urgent surgical intervention was planned. Options included:

a. Mitral valve repair or replacement.

b. Debridement of abscess cavity.

Outcome & Follow-Up

The patient was referred to another center for mitral valve surgery with debridement of the abscess cavity due to nonavailability of CTVS surgeon in our setup.

DISCUSSION

Why Did This Occur?

I. Staphylococcus aureus is a highly invasive pathogen that can cause deep-seated abscesses and bacteremia .

II. Bacteremia from the thigh abscess likely seeded the mitral valve, leading to annular abscess formation, rupture, and severe MR.

III. The absence of IE stigmata and sterile blood cultures made the diagnosis challenging.

Diagnostic Challenges

I. Prolonged empirical antibiotic therapy likely led to negative blood cultures, delaying definitive diagnosis .

II. Echocardiography was crucial in detecting the abscess and its complications5.

Why Is This Important?

III. Ruptured mitral annular abscess is a rare but fatal complication of Staphylococcus aureus endocarditis.

IV. Children with unexplained fever, bacteremia, and new-onset cardiac murmurs should be evaluated for IE, even in the absence of classic signs.

V. Surgical intervention is often life-saving in such cases

CONCLUSION

This case highlights the devastating complications of Staphylococcus aureus bacteremia, leading to ruptured mitral annular abscess with severe MR in a previously healthy child. Early echocardiographic evaluation, aggressive antimicrobial therapy, and timely surgical intervention are essential for a favorable outcome. Clinicians should maintain a high index of suspicion for endocarditis in children with unexplained fever and a new murmur, particularly in the setting of prior soft tissue infections.

REFERENCES:

1. Baltimore RS. Infective endocarditis in children. Pediatr Infect Dis J. 1992;11(10):907-12.
2. Ferrieri P, Gewitz MH, Gerber MA, et al. Unique features of infective endocarditis in childhood. Circulation. 2002;105(17):2115-26
3. Mylonakis E, Calderwood SB. Infective endocarditis in adults. N Engl J Med. 2001;345(18):1318-30.
4. Hoen B, Duval X. Clinical practice: infective endocarditis. N Engl J Med. 2013;368(15):1425-33.
5. Habib G, Lancellotti P, Antunes MJ, et al. 2015 ESC Guidelines for the management of infective endocarditis. Eur Heart J. 2015;36(44):3075-128.
6. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications. Circulation. 2015;132(15):1435-86.
7. Bayer AS, Bolger AF, Taubert KA, et al. Diagnosis and management of infective endocarditis and its complications. Circulation. 1998;98(25):2936-48.
8. Wilson W, Taubert KA, Gewitz M, et al. Prevention of infective endocarditis: guidelines from the American Heart Association. Circulation. 2007;116(15):1736-54.
9. Bensler JM, Kliegman RM. Infective endocarditis in childhood: 2015 update. Circulation. 2015;132(15):1487-1515.
10. Bendig EA, Singh J, Butler TJ, Arrieta AC. The impact of the central venous catheter on the diagnosis of infectious endocarditis using Duke criteria in children with Staphylococcus aureus bacteremia. Pediatr Infect Dis J. 2008;27:636–9.