International Journal of Cardiology Research

ISSN Print: 2663-4104
ISSN Online: 2663-4112
Impact Factor: RJIF 5.29
IJCR 2026; 8(1): 10-13
www.cardiologyjournal.in
Received: 12-11-2025
Accepted: 14-12-2025

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Suspicion of infective endocarditis in RHD complicated by extensively drug-resistant *Achromobacter denitrificans* bacteremia and cardioembolic stroke

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DOI: https://www.doi.org/10.33545/26634104.2026.v8.i1a.87

Abstract
Rheumatic heart disease (RHD) remains a significant cause of valvular pathology, often presenting with severe mitral regurgitation (MR). Atypical presentations combining RHD, complex neurological symptoms (chorea, stiffness, depressive symptoms), and severe systemic infection by a multidrug-resistant (MDR) organism pose major diagnostic and therapeutic challenges.

Case Presentation: A 20-year-old male presented with an 8-month history of whole-body stiffness, persistent depressive symptoms, chorea-like movements, constant headache, and acute dyspnea over the preceding 4-5 days. Physical examination revealed a high-pitched pansystolic murmur at the apex, suggestive of severe MR. Laboratory investigations showed microcytic hypochromic anemia (Hb 7.82 gm%), markedly elevated inflammatory markers (ESR 63 mm/hr), and elevated cardiac biomarkers (Troponin I 0.428 ng/mL; NT-proBNP 1751 pg/mL). Echocardiography confirmed RHD with severe eccentric mitral regurgitation, thickening/prolapse of the anterior mitral leaflet (AML), and a dilated left atrium (LA). Magnetic Resonance Imaging (MRI) of the brain revealed irregular lesions in the right frontotemporal and left parietal regions exhibiting diffusion restriction, suggestive of an acute/subacute infarct with hemorrhagic transformation. Multiple areas of susceptibility blooming were also noted in both cerebral and cerebellar lobes, consistent with old degraded blood products or microhemorrhages. Crucially, blood culture performed on April 1, 2025, grew Gram Negative Bacilli, subsequently identified as *Achromobacter denitrificans*. Susceptibility testing showed resistance (R) to a wide array of antibiotics, including *Piperacillin/Tazobactam*, *Cefepime*, *Amikacin*, *Gentamicin*, *Ciprofloxacin*, *Colistin*, *Cefrtiaxone*, *Cefoperazone/sulbactam*, Intermediate resistance (I) to Imipenem and Meropenem and susceptibility (S) to Trimethoprim/Sulfamethoxazole. The patient was managed with guideline-directed heart failure therapy, blood transfusion, and culture-directed antibiotics (Meropenem and Gentamycin ordered later, despite documented resistance to both), leading to clinical stabilization and partial improvement in neurological symptoms.

Conclusion: This case underscores the complexity of RHD, which can manifest with cardioembolic stroke and neurological sequelae in young adults. The superimposed bacteremia caused by MDR *A. denitrificans*, resistant to all 8 tested antibiotics, represents an extremely rare and high-risk complication requiring integrated cardiac, neurological, and infectious disease management.

Keywords: *Achromobacter denitrificans*, neurological, infectious disease management

Introduction
Rheumatic Heart Disease (RHD) remains a leading cause of acquired valvular heart disease globally, with approximately 33 million people affected worldwide, predominantly in low- and middle-income countries [1]. The disease most commonly affects the mitral valve, causing progressive valvular dysfunction that manifests as Mitral Regurgitation (MR), stenosis, or mixed valvular lesions [2]. While chronic valvular pathology is the hallmark of RHD, the disease spectrum extends beyond cardiac manifestations to include significant neurological and psychiatric complications.

The neuropsychiatric manifestations of RHD are diverse and clinically significant. Sydenham chorea, a post-streptococcal autoimmune neuropsychiatric movement disorder, represents a major diagnostic criterion for acute rheumatic fever and can present with choreiform movements, obsessive-compulsive symptoms, attention-deficit hyperactivity disorder, affective disorders, and psychotic features [3].

These neuropsychiatric symptoms may precede, accompany, or follow the cardiac manifestations, complicating both diagnosis and management.

Severe mitral regurgitation and Left Atrial (LA) enlargement significantly increase the risk of thromboembolic complications. Left atrial enlargement has been identified as an independent predictor of stroke, with studies demonstrating a graded association between LA size and stroke risk for each 1 cm increase in left atrial diameter, the odds of stroke increase by 24% [4]. Cardioembolic stroke accounts for approximately 15% of all strokes, with rheumatic heart disease identified as a significant causative factor in 8-65% of cases depending on geographic region [2]. Hemorrhagic transformation, a feared complication of ischemic stroke, occurs when prolonged ischemia weakens the cerebral vasculature, allowing blood to leak into infarcted tissue. This phenomenon is particularly common in cardioembolic strokes, with autopsy studies reporting hemorrhagic transformation rates of 18-42% in acute ischemic stroke due to arterial occlusion [5]. Risk factors include large infarct size, atrial fibrillation, anticoagulant use, and severe hypertension.

The occurrence of systemic bacteremia in patients with RHD represents a serious and potentially life-threatening complication. While bacteremia is commonly attributed to typical pathogens such as Staphylococcus and Streptococcus species, infection by opportunistic multidrug-resistant (MDR) Gram-negative organisms is highly atypical. Achromobacter denitrificans is an aerobic, non-fermenting Gram-negative bacillus that has emerged as an opportunistic pathogen, particularly in healthcare settings. This organism is intrinsically resistant to multiple antibiotic classes including most cephalosporins, aztreonam, and aminoglycosides, and increasingly demonstrates acquired resistance to carbapenems through metallo-β-lactamase production [6]. Bacteremia caused by A. denitrificans is exceedingly rare, with prevalence rates less than 0.1 cases per 1,000 hospital admissions, and is associated with poor prognosis due to limited therapeutic options [7].

This report details the unique and complex presentation of a young male with severe rheumatic mitral regurgitation complicated by cardioembolic infarcts with hemorrhagic transformation, atypical neuropsychiatric symptoms, and life-threatening bacteremia caused by extensively drug-resistant Achromobacter denitrificans.

Upon admission, the patient's vital signs were: Pulse 98 beats/min, Respiratory Rate (RR) 18-20/min, Blood Pressure (BP) 116/80 mmHg, Temperature 98°F, and oxygen saturation (SpO2) 98%. General examination noted a pale appearance consistent with anemia, but no pedal edema was documented. Cardiovascular examination revealed a high-pitched pansystolic murmur at the apex and a laterally displaced apical impulse. Respiratory examination showed bilateral bronchial breath sounds. Neurologically, he exhibited depressed mood, slowed psychomotor activity, and mild intermittent choreiform movements. His Glasgow Coma Scale (GCS) score was 15/15.

Timeline

Date	Events
8 months prior (First presentation to OPD)	Onset of body stiffness, headache, and depressive/psychomotor symptoms
4-5 days prior Presentation to OPD	Onset of acute dyspnea
28 Mar 2025	Admission (DOA); Initial labs (Hb 7.82, ESR 63, WBC 10600); Urine WNL; Initial treatment started (IVF, Inj Rantac, Inj CFT, Tab Ecospin); ECG performed.
29 Mar 2025	Troponin I (0.428 ng/mL); NT-proBNP (1751 pg/mL); Coagulation WNL; ASO negative; ECG performed.
30 Mar 2025	MRI Brain performed; suggestive of acute infarct with hemorrhagic transformation. Troponin I (0.193 ng/mL).
31 Mar 2025	2D-Echocardiography performed; confirmed RHD with Severe MR and Dilated LA.
01 Apr 2025	Blood sample collected for culture; Coagulation check.
04 Apr 2025	Microbiology report identifies Gram Negative Bacilli as *Achromobacter denitrificans* with MDR profile.
05 Apr 2025	Packed RBC transfusion (Unit 638); Antibiotics escalated (Inj Meropenem, Tab Corbis, Tab Valproic Acid added).
06 Apr 2025	Second PRBC transfusion (Unit 859); Meropenem continued/adjusted.

Diagnostic Assessment

Laboratory Investigations

Initial laboratory tests revealed significant abnormalities. A complete blood count showed microcytic, hypochromic anemia (Hemoglobin 7.82 gm/dL, MCV 60.0 fL, MCH 18.8 pg). The peripheral blood film confirmed microcytic hypochromic cells, anisopoikilocytosis, elliptocytes, and pencil cells. The Erythrocyte Sedimentation Rate (ESR) was markedly elevated at 63 mm/hr. Cardiac biomarkers were critically high: Troponin I measured 0.428 ng/mL (reference up to 0.04 ng/mL), decreasing to 0.193 ng/mL by March 30, and NT-proBNP was 1751.0 pg/mL (reference 0-450 pg/mL). Coagulation profiles (PT, aPTT) were within normal limits initially. Infectious workup for acute rheumatic fever (ASO) was negative, and screening for HIV, HCV, and HBsAg was non-reactive.

Cardiac Imaging and Electrocardiography

Electrocardiography (ECG) performed on March 28 showed sinus tachycardia with broad P-waves, consistent with possible left atrial enlargement. Subsequent ECGs supported these findings and raised suspicion for ventricular hypertrophy and potential acute infarct. Echocardiography confirmed the diagnosis of RHD with Severe Mitral Regurgitation (MR), characterized by anterior mitral leaflet thickening and prolapse, and a Dilated Left Atrium (LA). The Left Ventricular Ejection Fraction (LVEF) was preserved at approximately 60%. Mild aortic regurgitation (AR) and tricuspid regurgitation (TR) were also noted.

Microbiology and Susceptibility

A blood culture collected on April 1, 2025, initially demonstrated Gram Negative Bacilli. The organism was identified as *Achromobacter denitrificans*. The susceptibility

report indicated the isolate was resistant (R) to a wide array of antibiotics, including *Piperacillin/Tazobactam, Cefepime, Amikacin, Gentamicin, Ciprofloxacin, Colistin, Ceftriaxone, Cefoperazone/sulbactam*, intermediate resistance (I) to Imipenem and Meropenem and susceptibility (S) to Trimethoprim/Sulfamethoxazole.

Neuroimaging

MRI of the brain (1.5 Tesla) performed on March 30, 2025, showed specific vascular pathology:

- There was an ill-defined, irregular shaped abnormal signal intensity involving the right frontotemporal lobes and left parietal lobe.
- The lesion showed diffusion restriction with reversal on ADC, suggestive of acute/subacute infarct with hemorrhagic transformation.
- Multiple areas of susceptibility blooming were noted on SWI in both cerebral and cerebellar lobes, suggestive of old degraded blood products or microhemorrhages.
- The findings were correlated with a mixed vascular and inflammatory pathology, likely stemming from cardioembolic phenomena secondary to severe MR and LA dilation.

Therapeutic Intervention

The patient was initially (March 28) started on empirical broad-spectrum antibiotic therapy with Ceftriaxone (1 gm IV 12 hourly). Heart failure management included fluid restriction, intravenous fluids (NS/RL 500 cc IV 12 hourly), and cardiac medications: Tab Ecospin 75mg PO 24 hourly, and Tab Corbis (Bisoprolol) 2.5mg PO 24 hourly. Due to severe anemia (Hb 7.82 gm%), two units of Packed Red Blood Cells (PRBCs) were administered slowly over 4 to 6 hours on April 5 and April 6. Following the identification of MDR *Achromobacter denitrificans* on April 4, the antibiotic regimen was adjusted. Despite the documented resistance of the isolate to Meropenem, the patient was started on Meropenem 1gm IV (initially 12 hourly, later adjusted to 8 hourly) and Gentamycin 80mg IV 12 hourly. Other supportive medications included Tab Valproic Acid 250mg PO 12 hourly (likely for neurological symptoms/seizure prophylaxis), and Tab Dolo 650mg PO 12 hourly.

Date	Key Clinical Status, Diagnosis & Labs	Therapeutic Interventions (Rx)
March 28, 2025 (DOA 12:32 PM)	**Status:** Complaints of generalized weakness and stiffness for one month. Vitals T 98°F, P 80/min, BP 118/88 mmHg, SpO2 98%. **Labs:** Microcytic hypochromic anemia (Hb 7.82 gm%).	**Initial Orders (6:00 PM):** IVF NS/RL 500 CC IV 12 hourly, Inj Rantac 1 Amp IV 12 hourly, Inj CFT 1 gm IV 12 hourly, Tab Ecosprin 75mg 24 hourly. Advice: ECG stat, All Routine investigations, 2D-Echo, check S. Vit D3.
March 29, 2025	**Diagnosis/Cardiac**: 2D-Echo confirmed Rheumatic Heart Disease (RHD) with Severe Mitral Regurgitation (MR), AML-Thickened Mitral Valve, Dilated LA. Cardiac **Markers:** NT-pro BNP elevated (1751.0 pg/mL), Troponin-I elevated (0.428 ng/mL). ASO test was Negative.	**Added:** Tab Corbis 2.5mg P/O 24 hourly (4:00 PM).
March 30, 2025	**Radiology:** MRI Brain showed findings suggestive of infarct with hemorrhagic transformation. Also noted multiple areas suggestive of old degraded blood products. Troponin-I measured 0.193 ng/mL.	**Added (8:00 AM):** Inj Benzathine 1M 2.4lU IM every 21 days. Tab Warfarin 1mg P/O 24 hourly started.
March 31, 2025	**Status:** Troponin I noted (0.422 $\to$ 0.193).	**Changes (8:00 AM):** Tab Warfarin 1mg STOPPED. Added: Tab Valproic Acid 250mg P/O 12 hourly. Added (6:00 PM): Tab Dolo 650mg P/O 12 hourly. Advice: Check PT-INR, APTT, and C.S.T.
April 1, 2025	**Infection Status:** Preliminary blood culture report showed Gram Negative Bacilli seen. Coagulation stable (PT 13.9, INR 1.20; APTT 27.3 Sec).	**Added (8:00 AM):** Inj Gentamicin 80mg IV 12 hourly. Continued existing IV fluids, Rantac, CFT, Corbis, Dolo, and Valproic Acid.
April 4, 2025	**Microbiology:** Final culture identified Acinetobacter denitrificans. Organism was resistant (R) to Ceftriaxone (CFT) and Gentamicin. Susceptible (S) to Cotrimoxazole (Sulfamethoxazole/Trimethoprim). Coagulation: PT 13.3, INR 1.15; APTT 30.7 Sec.	**Added (4:00 PM):** Tab SAPTRAN-DS P/O 12 hourly.
April 5, 2025	**Status:** Hb improved to 9.63 gm%; WBC count 14100 /cumm.	**Antibiotic Change (8:05 AM):** Inj Meropenem 1gm IV 12 hourly started. Blood Transfusion (BT): 1 Unit PRBC (Bag No. 638, B +ve) ordered to be transfused slowly over 6 to 4 hours (2:35 PM to 5:10 PM). BT Safety Protocol: Inj Lasix 10mg ordered mid-transfusion; Inj Avil 1 Amp IV STAT and Inj Dexona 8mg IV STAT ordered for potential blood reaction.
April 6, 2025	**Status:** Diagnosis RHD + MR + AML.	**Medication Change (8:30 AM):** Inj Meropenem 1gm IV frequency increased to 8 hourly. Immediate Rx (5:00 PM): Inj Calcium Gluconate 1 Amp IV STAT + 100 cc NS administered. Blood Transfusion (BT): 1 Unit PRBC (Bag No. 859, B +ve) ordered for slow transfusion (started 2:50 PM).
April 7, 2025	**Labs:** Hb 12.61 gm%. WBC count 13500. Coagulation stable (PT 11.5, INR 1.13; APTT 29.8 Sec).	**Medication Change (8:00 AM):** Inj Meropenem 1gm IV frequency reverted to 12 hourly. Advice: Check C.S.T, PT/INR.
April 8, 2025	**Status:** Diagnosis RHD + MR + AML.	**Maintenance:** Continued IVF NS/RL, Inj Ranta/Ranitac, Inj Meropenem, Tab SEPIRAN-DS, Tab Dolo, Tab Corbis, and Tab Valproic Acid (all 12 or 24 hourly as previously established).

4.6 Follow-up and Outcomes

During the hospital stay, the patient's dyspnea improved with medical therapy, including diuretics. The complex neurological symptoms, including headache and stiffness, showed partial improvement. Given the persistent severe mitral regurgitation, the patient was referred for surgical evaluation (mitral valve repair or replacement). He was discharged with guideline-directed RHD therapy.

5. Discussion

This case is highly complex due to the convergence of severe rheumatic heart disease, acute cardioembolic stroke, atypical neuropsychiatric presentation, and a challenging MDR bacterial infection [1, 7].

The severe MR in the context of RHD, accompanied by a dilated left atrium, establishes a clear cardiac source for emboli [4]. The MRI findings acute infarcts evidenced by

diffusion restriction and multifocal old microbleeds indicated by susceptibility blooming strongly support recurrent or mixed-stage cardioembolic events [5, 8]. These vascular insults are the probable drivers of the patient's atypical neurological symptoms, including the depressive state, stiffness, and choreiform movements, demonstrating the profound neurocardiac interaction inherent in advanced RHD. While the symptoms are reminiscent of Sydenham chorea, the presence of definite infarcts suggests a secondary vascular or inflammatory chorea [3].

The isolation of *Achromobacter denitrificans* from blood culture is the most striking feature complicating this case [6, 7]. *Achromobacter* species are opportunistic, often MDR pathogens associated with hospital-acquired infections, especially in immunocompromised hosts or those with indwelling devices. The organism isolated here demonstrated resistance to 8 tested antibiotics. Although Meropenem and Gentamycin were prescribed post-culture, the documented resistance to other agents highlights the limited therapeutic options available and the difficulty in managing such highly resistant Gram-negative bacteremia. The presence of bacteremia in a patient with severe valvular disease, elevated Troponin I, and cerebrovascular events raises strong suspicion for infective endocarditis (IE), even though the echocardiogram did not explicitly document vegetations, only valve thickening and prolapse. The elevated cardiac biomarkers (Troponin I and NT-proBNP) further underscored the acute cardiac stress and potential myocardial injury associated with severe MR and/or septic emboli.

In the Indian context, the coexistence of severe rheumatic mitral regurgitation, multifocal cardioembolic infarcts with hemorrhagic transformation, atypical neuropsychiatric manifestations, and multidrug-resistant Achromobacter denitrificans bacteremia in a single young adult appears to be exceedingly uncommon, making this report a valuable addition to the limited regional experience. By documenting chronic behavioral and choreiform symptoms, objective MRI evidence of recurrent embolic injury, and microbiologically confirmed extensively drug-resistant Achromobacter infection in a patient with established RHD, this case underscores an under-recognized overlap between valvular heart disease, stroke neurology, and emerging nosocomial Gram-negative pathogens. It highlights the need for high clinical suspicion of cardioembolic stroke in RHD patients with new psychiatric or movement-disorder presentations, early MRI and blood culture acquisition before antibiotic escalation, and strengthening of local antimicrobial stewardship protocols to account for rare but highly resistant non-fermenters in resource-limited, high-RHD-burden settings.

6. Conclusion

This case reports a rare and challenging presentation of severe rheumatic mitral regurgitation complicated by cardioembolic infarcts, atypical neuropsychiatric manifestations, and bacteremia caused by multidrug-resistant *Achromobacter denitrificans* [6, 7]. The integration of advanced cardiac and neurological imaging is essential for accurate diagnosis. The identification of an extensively drug-resistant pathogen underscores the necessity for timely blood cultures and susceptibility testing in patients presenting with systemic symptoms and established valvular disease. Management required comprehensive intervention focusing on heart failure control, anemia correction, neurological stabilization, and targeted (albeit challenging) antibiotic therapy, followed by surgical referral for the severe valvulopathy

Conflict of Interest
Not available

Financial Support
Not available

References

1. Watkins DA, Johnson CO, Colquhoun SM, Karthikeyan G, Beaton A, Bukhman G, *et al*. Global, Regional, and National Burden of Rheumatic Heart Disease, 1990-2015. N Engl J Med. 2017 Aug 24;377(8):713-22.
2. Ko KY, Kim SE, Hwang JW, Cho SW, Kwak JJ. Rheumatic heart disease manifesting as mitral stenosis and tricuspid regurgitation in a young Asian male: A case report. Eur Heart J Case Rep. 2024 Oct 1;8(10):ytae500.
3. Punukollu M, Mushet N, Linney M, Hennessy C, Morton M. Neuropsychiatric manifestations of Sydenham's chorea: A systematic review. Dev Med Child Neurol. 2016;58(1):16-28.
4. Xu Y, Zhao L, Zhang L, Han Y, Wang P, Yu S. Left atrial enlargement and the risk of stroke: A meta-analysis of prospective cohort studies. Front Neurol. 2020 Feb 14;11:26.
5. Sussman ES, Connolly ES Jr. Hemorrhagic transformation: A review of the rate of hemorrhage in the major clinical trials of acute ischemic stroke. Front Neurol. 2013 Jun 10;4:69.
6. Isler B, Kidd TJ, Stewart AG, Harris P, Paterson DL. *Achromobacter* infections and treatment options. Antimicrob Agents Chemother. 2020 Oct 20;64(11):e01025-20.
7. Jain M. *Achromobacter denitrificans* blood stream infection in adult patients: Clinical and microbiological features from a tertiary care centre in North India. J Clin Images Med Case Rep. 2023 Aug 7;4(8):2531.
8. Premkumar DK, Naik DR, Sab DM, Indurekha DP, Reddy DK, Dara DC. Exploring clinical characteristics, arterial territories, and cardiac abnormalities in cardioembolic stroke. Eur J Cardiovasc Med. 2024 Dec 30;14:723-725.

How to Cite This Article
Gupta NK, Mangrola J, Nayak K. Suspicion of infective endocarditis in RHD complicated by extensively drug-resistant *Achromobacter denitrificans* bacteremia and cardioembolic stroke. International Journal of Cardiology Research. 2026;8(1):10-13.