



CASE REPORT

An Uncommon Culprit: *Leclercia Adecarboxylata* Causing Native Mitral Valve Infective Endocarditis in an Immunocompromised Host

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Abstract

Leclercia adecarboxylata is an uncommon pathogen causing infective endocarditis, with limited number of infections reported in the literature. A literature review showed only three case of infective endocarditis caused by *L. adecarboxylata* had been reported up to 2022, highlighting the organism's rarity as a cause of endocarditis in clinical practice. We report a unique case of native mitral valve infective endocarditis in a 69-year-old woman with long-standing diabetes mellitus and hypertrophic non-obstructive cardiomyopathy. Although initial blood cultures yielded methicillin-sensitive *Staphylococcus epidermidis*, definitive diagnosis was established intraoperatively when purulent material and excised mitral valve tissue grew pan-sensitive *Leclercia adecarboxylata*, fulfilling a major criterion of the 2023 Duke-ISCVID infective endocarditis guidelines. This case illustrates the emerging role of uncommon pathogens in infective endocarditis and reinforces the diagnostic significance of valve tissue cultures and intraoperative evidence in modern clinical practice.

Key Words

Leclercia Adecarboxylata, Infective Endocarditis, Native Mitral Valve, Opportunistic Infection, Immunocompromised Host

Introduction

Leclercia adecarboxylata is a Gram-negative bacterium first described by H. Leclerc in 1962.^[1] *L. adecarboxylata* is considered as an opportunistic pathogen. Human infections are rare, predominantly affecting immunocompromised individuals, with diabetes mellitus, malignancy, or receiving long-term immunosuppressive therapy.^[2,3] A 2025 literature review showed 227 cases of *L. adecarboxylata* infection involving various organ

systems have been reported worldwide, with the highest incidence in Asia.^[4] However only three case of infective endocarditis caused by *L. adecarboxylata* had been reported up to 2022, highlighting the organism's rarity as a cause of endocarditis in clinical practice.^[5]

Here, we report a rare case of native mitral valve infective endocarditis caused by *L. adecarboxylata*. This case underscores the emerging pathogenic potential of

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this bacterium and emphasizes the importance of accurate microbiological identification, susceptibility testing and awareness of atypical Gram-negative organisms in managing rare infections.

Case Report

69-year-old woman with a 20-year history of hypertension, diabetes and hypertrophic non-obstructive cardiomyopathy presented with acute orthopnea. She was afebrile, without classical infective endocarditis signs. Examination revealed tachycardia (130 bpm), a systolic murmur, and blood pressure 130/90 mmHg; lungs were clear. Laboratory tests showed leukocytes 8,400/mm³, hemoglobin 11 g/dL, platelets 248,000/mm³, and ESR 110 mm/hour. Transthoracic echocardiography revealed severe mitral regurgitation and pulmonary hypertension, while coronary angiography demonstrated double-vessel disease. Transesophageal echocardiography identified

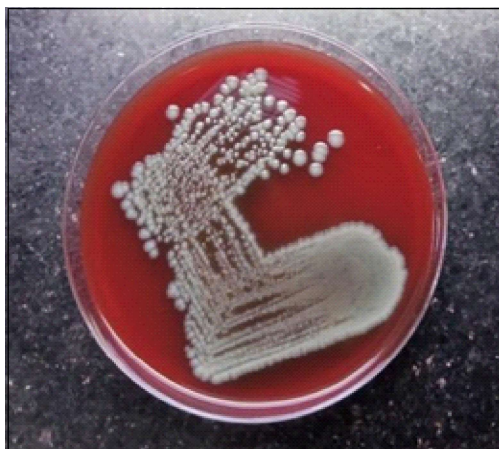


Figure 1: Non-Hemolytic Colonies of *Leclerciaadecarboxylata* in Blood Agar Plate (BAP).

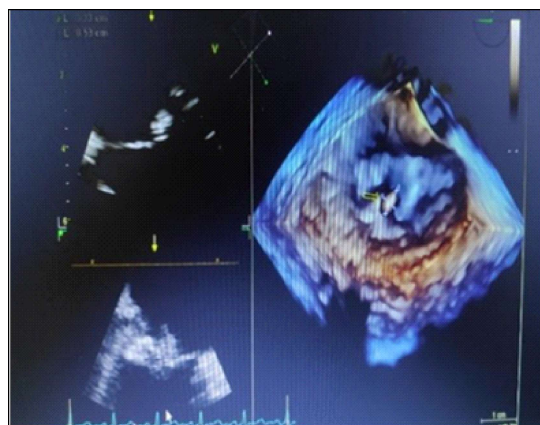


Figure 2: Vegetation in Mitral Valve – Transesophageal Echocardiogram (TEE) image.

mobile mitral valve vegetations. Blood cultures grew methicillin-sensitive *Staphylococcus epidermidis*, treated with IV cefazolin for 14 days. She underwent coronary artery bypass grafting with mitral valve replacement; intraoperative pus and excised valve tissue culture growing *Leclercia adecarboxylata*, fulfilling the 2023 Duke–ISCVID surgical evidence criterion. Postoperatively, she received four weeks of IV ceftriaxone. Complications included hypoxemia requiring re-intubation, anuria requiring peritoneal dialysis, and eventual pacemaker placement. This case emphasizes the role of surgical tissue cultures and multimodal diagnostics in identifying rare native valve endocarditis pathogens.

Discussion

Infections caused by *Leclercia adecarboxylata* have been reported in both immunocompetent and, immunocompromised state. In this patient, the diagnosis of native mitral valve infective endocarditis (IE) was established using the 2023 Duke–ISCVID criteria, which build upon the original Duke framework. The traditional Duke criteria combine clinical features, microbiological evidence, and echocardiographic findings to classify IE as definite, possible, or rejected. Major criteria include positive blood cultures for typical IE pathogens and echocardiographic evidence of endocardial involvement, while minor criteria incorporate predisposing heart conditions, fever, vascular or immunologic phenomena, and microbiologic findings not meeting major criteria.^[6] The 2023 Duke–ISCVID update enhances this framework by incorporating advanced imaging modalities and recognizing surgical evidence of IE, such as purulent material or infected valve tissue, as a major diagnostic criterion. This revision is particularly valuable for detecting infections caused by rare or fastidious organisms, such as *L. adecarboxylata*, or when blood cultures are inconclusive.

In this case, although initial blood cultures grew *Staphylococcus epidermidis*, definitive identification of *L. adecarboxylata* was achieved through valve tissue culture and biopsy obtained during mitral valve replacement. Histopathological examination of the excised valve confirmed purulent material and inflammatory infiltrates, emphasizing the diagnostic value of tissue-based confirmation. Additional adjunctive diagnostic tools, including PCR, 16S rRNA sequencing, serology for fastidious pathogens, and advanced imaging modalities such as transesophageal echocardiography or PET-CT, can be especially helpful in culture-negative or atypical presentations.^[7,8]

The patient's long-standing diabetes mellitus, hypertension, and hypertrophic non-obstructive cardiomyopathy likely contributed to immunocompromise, facilitating translocation of *L. adecarboxylata*, a gastrointestinal commensal, to the native mitral valve.^[9] The rarity of *L. adecarboxylata* endocarditis, with only a handful of cases reported globally, underscores the importance of clinical vigilance for unusual Gram-negative pathogens. This case highlights the necessity of a multimodal approach combining clinical evaluation, microbiological testing, imaging, and surgical findings to ensure accurate and timely diagnosis. Awareness of emerging pathogens and prompt, precise microbiological identification are critical for guiding targeted antimicrobial therapy and improving outcomes in patients with infective endocarditis caused by rare organisms.

Conclusion

Leclercia adecarboxylata is an emerging, opportunistic Gram-negative pathogen that can cause serious infections, including infective endocarditis, particularly in individuals with underlying comorbidities or immunocompromised states. This case highlights the importance of maintaining a high index of suspicion for atypical organisms in patients with multiple risk factors and culture-negative or polymicrobial endocarditis. Accurate species-level identification using modern diagnostic methods and adherence to updated Duke–ISCVID 2023 criteria are crucial for timely diagnosis and appropriate management. Early recognition and targeted antibiotic therapy can significantly improve patient outcomes in such rare infections.

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