

A silent sequel to Kshara Sutra: *Enterococcus faecium*–induced infective endocarditis in mitral valve prolapse

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Abstract

Background: *Enterococcus faecium* is an opportunistic Gram-positive organism that forms part of the normal gastrointestinal flora and is increasingly recognized as an important nosocomial pathogen. Although infective endocarditis caused by *Enterococcus faecium* is relatively uncommon, it is associated with significant morbidity due to antimicrobial resistance and prolonged bacteremia. Infective endocarditis following a Kshara Sutra procedure is an exceptionally rare clinical presentation, particularly in patients with underlying structural heart disease. Case

Description: A patient with mitral valve prolapse presented with prolonged fever, night sweats, cough, weight loss, and elevated inflammatory markers following a Kshara Sutra procedure. Blood cultures grew *Enterococcus faecium*, and echocardiography demonstrated vegetation on the mitral valve with severe mitral regurgitation, confirming the diagnosis of infective endocarditis. The patient was treated with prolonged intravenous antibiotic therapy, resulting in clinical improvement, and was discharged in stable condition.

Case Assessment: The diagnosis was established based on positive blood cultures and echocardiographic evidence of mitral valve vegetation, consistent with infective endocarditis. The temporal association between the Kshara Sutra procedure and symptom onset suggested a possible procedural source of bacteremia in the presence of a predisposing valvular abnormality.

Conclusion: This case highlights the rare occurrence of *Enterococcus faecium* infective endocarditis following a Kshara Sutra procedure in a patient with mitral valve prolapse. It emphasizes the importance of maintaining a high index of suspicion for infective endocarditis in patients with persistent fever after invasive procedures, particularly those with underlying valvular heart disease. Early diagnosis and appropriate prolonged antimicrobial therapy are essential to achieve favorable clinical outcomes.

Keywords: *Enterococcus faecium*; Infective endocarditis; Kshara Sutra; Valve vegetation; Blood culture; Mitral regurgitation

1. Introduction

Infective endocarditis (IE) is a potentially life-threatening disease characterized by infection and inflammation of the endocardial surface of the heart, commonly involving the cardiac valves.¹ The disease is associated with significant morbidity and mortality despite advances in diagnostic techniques and antimicrobial therapy. Common causative organisms include streptococci, staphylococci, enterococci, and HACEK organisms.^{2,3}

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Enterococcus faecium is a gram-positive cocci commonly present in the gastrointestinal tract as a commensal organism. In recent years, it has emerged as a major healthcare-associated pathogen due to its intrinsic resistance to multiple antibiotics and its ability to survive in harsh environmental conditions.³ Enterococcal infective endocarditis accounts for approximately 10% of all cases of infective endocarditis.⁴

Transient bacteremia can occur following gastrointestinal, genitourinary, and anorectal procedures.⁵ Kshara Sutra procedure, an Ayurvedic para-surgical treatment commonly used for hemorrhoids, may predispose susceptible individuals to bacteremia and subsequent infective endocarditis. Here we report a rare case of *Enterococcus faecium* induced infective endocarditis following Kshara Sutra procedure.

2. Literature review

2.1. Arias CA et al. (The rise of the *Enterococcus*: beyond vancomycin resistance)

Arias CA and Murray BE described *Enterococcus faecium* as an emerging multidrug resistant nosocomial pathogen with increasing clinical importance. The organism possesses intrinsic resistance to several antibiotics and can survive prolonged environmental exposure, making treatment challenging in infective endocarditis.³

2.2. Fernández-Hidalgo N et al. (Enterococcal endocarditis: current treatment and future directions)

Fernández-Hidalgo N et al. reported that enterococci account for approximately 5–15% of infective endocarditis cases. *Enterococcus faecalis* is the most common species implicated, while *Enterococcus faecium* associated infective endocarditis is relatively uncommon but associated with high morbidity and prolonged hospitalization.⁴

2.3. Habib G et al. (ESC Guidelines for the management of infective endocarditis)

Habib G et al. emphasized the role of echocardiography in diagnosing infective endocarditis. Valvular vegetations appear as mobile echogenic masses attached to valve leaflets with independent motion and may be associated with valvular destruction or regurgitation.⁵

2.4. Wilson W et al. (Prevention of infective endocarditis)

Wilson W et al. highlighted that invasive gastrointestinal and anorectal procedures can produce transient bacteremia, especially in patients with underlying valvular abnormalities. Such bacteremia may predispose susceptible individuals to infective endocarditis.⁶

2.5. Gould FK et al. (Guidelines for the diagnosis and antibiotic treatment of endocarditis in adults)

Gould FK et al. discussed the importance of prolonged culture-guided antimicrobial therapy in enterococcal infective endocarditis because of increasing antimicrobial resistance, especially resistance to aminoglycosides and vancomycin among *Enterococcus faecium* isolates.⁹

3. Case report

A 48-year-old gentleman, a known case of systemic hypertension and mitral valve prolapse on treatment (T. Corbis-T), presented with complaints of evening rise of temperature, night sweats, and intermittent cough for 1.5–2 months. The fever was insidious in onset, intermittent, predominantly occurring during evenings, and associated with chills and sweating. The patient also reported generalized weakness and significant unintentional weight loss of approximately 7 kg over the previous 3 months.

The patient had undergone Kshara Sutra procedure prior to the onset of symptoms. He had consulted multiple healthcare facilities and received several courses of antibiotics without significant improvement. There was no history of chest pain, hemoptysis, burning micturition, or orthopnea.

3.1. Past history

Systemic Hypertension, Newly detected Type 2 Diabetes Mellitus and mitral valve prolapse

3.2. General examination

The patient was conscious, oriented, and thin built.

VITALS

- Blood Pressure – 110/60 mmHg
- Respiratory Rate – 18/min
- Heart Rate – 103 bpm
- SpO₂ – 100% in room air
- GCS – E4V5M6

3.3. Systemic examination

Cardiovascular System-S1 and S2 present with pan systolic murmur over mitral area.

3.4. Investigations

3.4.1. Hematological investigations

Hemoglobin – 10.8 g/dL, Total Leukocyte Count – 10,560 cells/mm³, Neutrophils – 79%, Lymphocytes – 16%, Platelet Count – 3.13 lakh/ μ L, ESR – 77 mm/hr, CRP – 77.2 mg/L and Peripheral smear showed moderate anemia with mild hypochromic blood picture and mild neutrophilia.

3.4.2. Biochemical investigations

Serum Creatinine – 0.84 mg/dL, Blood Urea – 18.5 mg/dL, AST (SGOT) – 33 U/L, ALT (SGPT) – 61 U/L, Serum Albumin – 3.87 g/dL, HbA1c – 6.9%, Mantoux test, stool occult blood, and Tuberculosis Interferon Gamma Release Assay were negative.

3.4.3. Blood culture

Blood culture from multiple sites showed growth of gram-positive cocci in pairs and chains, later identified as *Enterococcus faecium*. The organism was resistant to Ampicillin and sensitive to Linezolid and Vancomycin.

3.4.4. Echocardiography findings

2D Echocardiography revealed:

- Grossly dilated left atrium
- Normal LV systolic function (LVEF = 72%)
- Flail posterior mitral leaflet
- Vegetation over mitral valve
- Severe mitral regurgitation
- Grade II tricuspid regurgitation with mild pulmonary hypertension
- No clot or pericardial effusion

Based on Modified Duke's criteria, the patient was diagnosed with infective endocarditis.

3.5. Course in the hospital

The patient was admitted with a provisional diagnosis of pyrexia of unknown origin with anemia under evaluation. Further evaluation including HRCT chest and echocardiography raised suspicion of infective endocarditis.

Based on culture sensitivity and infectious disease consultation, the patient was started on Linezolid 600 mg twice daily. Therapeutic drug monitoring (TDM) of Linezolid was performed by the Clinical Pharmacology department.

The patient was later initiated on intravenous Vancomycin. During infusion, the patient developed Vancomycin infusion related hypersensitivity reaction (Vancomycin histamine release syndrome) when the infusion rate was increased. Antibiotics were administered through a PICC line and was inserted in the right cephalic vein and Vancomycin was administered slowly over one hour, following which the patient tolerated therapy well.

The patient showed symptomatic improvement with resolution of fever and reduction in inflammatory markers.

4. Discussion

Enterococcus faecium induced infective endocarditis is an uncommon but clinically significant condition due to multidrug resistance and prolonged bacteremia.^{3,5} In this patient, the probable source of bacteremia was the Kshara Sutra procedure, which might have facilitated bacterial translocation into the bloodstream.

The patient fulfilled Modified Duke's criteria for infective endocarditis with positive blood cultures and echocardiographic evidence of vegetation.^{1,2,4} Echocardiography demonstrated severe mitral regurgitation with vegetation over the mitral valve leaflet.

This case underscores the importance of maintaining a high index of suspicion for infective endocarditis in patients presenting with prolonged fever following invasive anorectal procedures. Although infective endocarditis secondary to Kshara Sutra therapy has been scarcely documented in the literature, the potential risk of bacteremia associated with such interventions highlights the need for careful pre-procedural risk assessment and consideration of infective endocarditis prophylaxis in susceptible individuals, in accordance with established clinical guidelines.^{4,6} Prompt recognition, timely diagnosis, multidisciplinary management, and prolonged culture-directed antimicrobial therapy are critical for minimizing morbidity and optimizing patient outcomes.^{2,4,8,9}

5. Conclusion

This case illustrates the diagnostic complexity of *Enterococcus faecium* infective endocarditis and highlights the importance of maintaining clinical vigilance in patients with persistent fever following invasive anorectal procedures. The presence of pre-existing mitral valve prolapse likely increased the patient's susceptibility to endocardial infection, emphasizing the role of host-related risk factors in disease development. Comprehensive microbiological evaluation, echocardiography, and multidisciplinary management enabled early diagnosis and successful treatment. Reporting such rare clinical presentations contributes to the growing body of evidence on procedure-associated infective endocarditis and reinforces the need for individualized risk assessment, appropriate follow-up, and timely intervention to prevent serious complications.

Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interest.

Statement of Informed consent

The authors certify that they have obtained all appropriate patient consent forms. The patient has consented to the reporting of clinical information in the journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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