



# A Case Study: Left Atrial Mural Vegetations in a Patient with Infective Endocarditis Complicated by Septic Embolism

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## ABSTRACT

Infective Endocarditis (IE) is associated with severe complications including cardiac failure, septic embolisation to distant organs, and significant mortality, if not promptly diagnosed and treated. It is therefore pertinent to perform diagnostic echocardiography in patients who have clinical suspicion of IE as it can reveal size and location of vegetations along with the extent of infection in the surrounding tissue and aid in confirming a therapeutic response. Vegetations in IE usually involve the valves but rarely may be located in the ventricles. Left atrial mural vegetation is a very rare condition. The common pathogen causing IE is *Staphylococcus Aureus* seen in more than half of the cases. *Streptococcus Viridans* is a less virulent organism, found as a part of normal oral, respiratory, gastrointestinal and genital bacterial flora but has the potential to cause invasive bacteremia and infections. A 20-year-old female presented with fever, palpitations, and shortness of breath on exertion for last 4 months. She then had developed sudden onset left sided body weakness and facial weakness. She had an ill-sustained heaving apex beat with grade 4 pan-systolic murmur at mitral area. There was upper motor left-sided uncrossed hemiplegia. Transesophageal echocardiography revealed anterior mitral leaflet vegetation along with 2 vegetations attached to the posterior left atrial wall and the jet of mitral valve regurgitation was directed to the posterior wall of the left atrium towards the vegetations. Blood cultures revealed gram-positive *Streptococcus Viridians* sensitive to vancomycin which was continued. MRI Brain revealed hypodense T1WS and hyperdense T2WS/FLAIR area in the right lentiform nucleus. The final diagnosis was Infective Endocarditis with left atrial mural vegetations due to *Streptococcus Viridians*, complicated by septic embolisation causing stroke. At 6-week follow up, she was clinically asymptomatic and a repeat echocardiography demonstrated resolution of the vegetations.

**Keywords:** Infective Endocarditis, Anterior Mitral Leaflet Vegetation, Left Atrial Mural Vegetation, *Streptococcus Viridans*, Vancomycin.

## INTRODUCTION

A relatively rare cardiac disease, Infective Endocarditis (IE) is associated with severe complications including cardiac failure, septic embolisation to distant organs and significant mortality. Prompt diagnosis and early treatment of IE is required to prevent complications and death.<sup>1</sup> Structural cardiac abnormality especially pre-existing valvular disease predisposes to infection of

the heart valves and endocardium by various bacteria and fungi.

Vegetations in IE usually involve the valves, but rarely may be located in the ventricles.<sup>2</sup> Left atrial mural vegetations have been reported in the past but this is a very rare condition with only a handful of case reports available on the subject.<sup>1,3,4,5</sup> It is postulated that as a result of mitral regurgitation and the high-velocity regurgitant jet, endothelial disruption and platelet fibrin deposition occurs which leads to adherence of pathogens, resulting in infection of the damaged endothelium.<sup>6,7</sup> Herein we report the case of a 20-year old female with fever, palpitations and shortness of breath on exertion and left-sided body weakness with left upper-motor facial nerve palsy. The full diagnosis was Infective Endocarditis with left atrial mural vegetations due to *Streptococcus Viridians*, complicated by septic embolisation causing stroke. This case highlights the rare occurrence of left atrial mural vegetations as a part of infective endocarditis.

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Submission Date: 7<sup>th</sup> July 2024

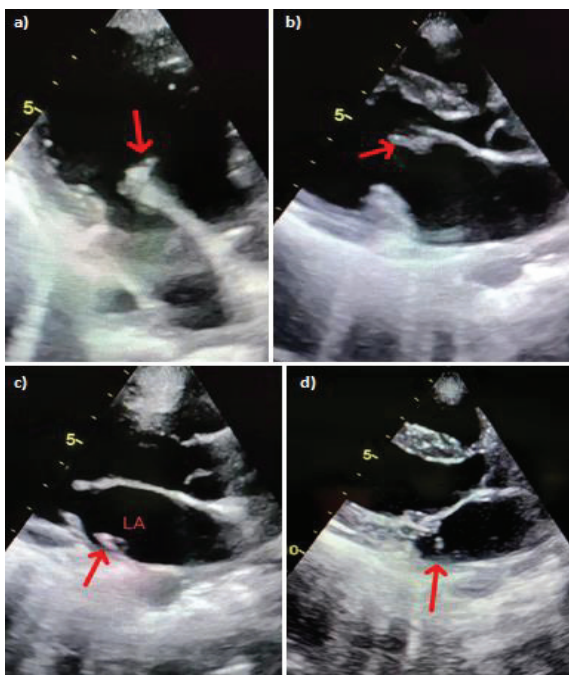
1<sup>st</sup> Revision Date: 29<sup>th</sup> August 2024

Acceptance Date: 31<sup>st</sup> August 2024

## MATERIAL AND METHODS

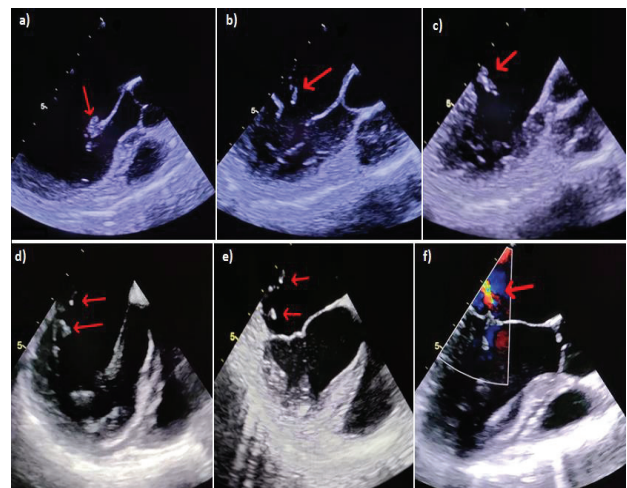
A 20-year-old female presented with intermittent low grade fever for the last 4 months, documented up to 101<sup>0</sup>F, having nocturnal rise, associated with chills and generalized bodyaches, but relieved partially by taking paracetamol. She reported palpitations and mild shortness of breath on exertion, relieved by rest. For these complaints, she had consulted a few local general practitioners and had taken short courses of various antibiotics but the symptoms recurred. She then had developed sudden-onset left sided body weakness and facial weakness. There was no history of cough, sore throat, skin rashes, joint pains, altered bowels, urinary problems, dental caries or previous rheumatic fever. She was unmarried and denied any sexual contact. There was no history of cigarette smoking, alcohol or illicit drug use. On examination, the patient was pale and had a fever of 100<sup>0</sup>F. She had an ill-sustained heaving apex beat at 5<sup>th</sup> intercostal space in the mid-clavicular line with a grade 4 pan-systolic murmur at the mitral area which radiated to the left axilla. There was upper motor left-sided facial nerve palsy. Muscle bulk and tone were normal in all four limbs but power was 4/5 in left upper and lower limbs with left-sided extensor plantar response. Rest of the examination was unremarkable.

**Figure 1: Transthoracic Echocardiography showing vegetations on anterior mitral leaflet (a, b) and posterior wall of left atrium (c, d)**



On investigation, she had hemoglobin 9.1g/dl with normal TLC and platelet count. Her RFTs, LFTs and urinalysis were within normal parameters. ASO Titer were negative. Blood cultures revealed gram-positive *Streptococcus Viridians* which was sensitive to vancomycin. As shown in Figure 1, an initial 2D transthoracic echocardiography of the patient revealed vegetations on the anterior mitral leaflet (AML) and the posterior left atrial wall along with moderate-to-severe mitral regurgitation. Subsequently, a transesophageal echocardiography was done which confirmed an AML vegetation along with 2 vegetations attached to the posterior left atrial wall, and the jet of mitral valve regurgitation was directed to the posterior wall of the left atrium, where the vegetations were found, as shown in Figure 2. MRI Brain revealed hypodense T1WS and hyperdense T2WS/FLAIR area in the right lentiform nucleus consistent with acute septic embolic stroke. The patient was diagnosed as Infective Endocarditis with left atrial mural vegetations due to *Streptococcus Viridians*, complicated by septic embolisation causing stroke. She was managed with vancomycin 2g/day for 6 weeks and showed good clinical recovery. A repeat echocardiography at 6 weeks revealed resolution of the vegetations.

**Figure 2: Transesophageal Echocardiography showing vegetations on anterior mitral leaflet (a), posterior wall of left atrium (b, c, d, e) and jet of mitral regurgitation directed towards posterior left atrial wall where vegetations are present (f)**



## DISCUSSION

To detect left atrial mural vegetation by transthoracic echocardiogram is a difficult task at an early phase. A delay in diagnosis of IE consequently

may result in vegetation enlargement and septic embolism.<sup>1</sup> It is therefore pertinent to perform transesophageal echocardiography in patients who have clinical suspicion of IE as it can reveal accurate size and location of vegetations along with extent of infection in the surrounding tissue and aid in confirming a therapeutic response. Furthermore, the precise observation of the structure, including the atrial wall, is necessary if the mitral regurgitant jet is eccentric and aimed towards the atrial wall.<sup>1</sup> Peak incidence of IE is in elderly aged  $\geq 70$  years old and various associated risk factors include presence of prosthetic valves, intracardiac devices, diabetes mellitus, hemodialysis and intravenous drug abuse.<sup>8,9,10</sup> On the other hand, patients who have left atrial mural endocarditis are younger and have absence of these risk factors.<sup>1</sup> Therefore, making the diagnosis of left atrial mural endocarditis is challenging. Our patient with left atrial mural vegetations had a young age with no obvious IE risk factors and transesophageal echocardiography was used to confirm the vegetations. The common pathogen causing IE is *Staphylococcus Aureus* seen in more than half of the cases.<sup>11,12</sup> *Streptococcus Viridans* is a less virulent organism, found as a part of normal oral, respiratory, gastrointestinal and genital bacterial flora, but has the potential to cause invasive bacteremia and infections.<sup>12</sup> In our patient, streptococcus viridians was the culprit pathogen and was sensitive to vancomycin. After 6 weeks of therapy, the vegetations had resolved, as evidenced by repeat echocardiography. Indications for surgery in patients with IE include severe valve dysfunction, severe heart failure, prosthetic valve infection, large mobile vegetations, recurrent systemic embolization, or persistent sepsis despite adequate antibiotic therapy for more than 5–7 days. Our patient did not have any of these complications, responded well to antibiotic therapy, and therefore cardiothoracic surgeon opinion was not sought.

### CONCLUSION

In conclusion, IE is a rare but serious cardiac disease. Left atrial mural vegetations are very rarely seen in IE. Our patient with IE had left atrial mural vegetations due to *Streptococcus Viridians* and the case was complicated by septic embolisation leading to stroke. However, she recovered fully in response to antibiotic treatment with vancomycin. This case highlights the importance of high clinical suspicion to diagnose IE so that prompt treatment may lead to less disease morbidity and mortality.

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