

# Infective Versus Libman Sacks Endocarditis In Systemic Lupus Erythematosus

Michael Thomas E Salvador\* and Sandra V Navarra

Rheumatology and Clinical Immunology, University of Santo Tomas Hospital, Manila Philippines, USA

## Abstract

**Background and objective:** Libman Sacks endocarditis is a rare cardiac manifestation of Systemic Lupus Erythematosus (SLE). Cardiac valve vegetations may also be due to infective endocarditis especially in patients with risk factors. We report a case of stroke in an SLE patient with positive anti-phospholipid antibodies and echocardiography findings of mitral valve vegetations.

**Case:** A 33-year old female with stable SLE for 5 years on hydroxychloroquine and prednisone 5 mg/day presented with diplopia and intermittent fever of 2 weeks duration. She has had recurrent throat and gingival infections in the past year treated with antibiotics. Physical exam disclosed right lateral rectus and left medial rectus palsy, grade 3/6 holosystolic apical murmur, and livedo reticularis. Hemoglobin was 9.2 g/dl, and erythrocyte sedimentation rate (ESR) 130 mm/hr, leucocyte and platelet counts, serum complement, urinalysis, renal and liver functions were normal. Lupus anticoagulant and anti-cardiolipin antibody (IgG) were strongly positive. Cranial Magnetic Resonance Imaging (MRI) revealed an infarct at the pontomedullary area, and transesophageal echocardiogram visualized echodense structures on the mitral valve consistent with vegetations. Blood cultures were negative for microorganisms. She was treated with high-dose steroid tapered to prednisone 20 mg/day, tinzaparin later shifted to warfarin and an antibiotic regimen consisting of penicillin and gentamycin administered for 2 weeks; hydroxychloroquine was continued. She was afebrile throughout hospitalization, with gradual resolution of the neurologic manifestations. A repeat cranial MRI 3 weeks later was normal.

**Conclusion:** This case highlights the challenges in clinically differentiating infective endocarditis from Libman Sacks endocarditis in a patient with risk factors for both conditions. She received empiric treatment for both with favourable outcome.

**Funding:** Lupus-Inspired Advocacy (LUIA) Project of Rheumatology Educational Trust Fund Inc. (RETFI).

## Introduction

Heart valve abnormalities can be found in 1 of every 3 patients with systemic lupus erythematosus (SLE), while valvular vegetations such as Libman Sacks endocarditis, are present in 1 on every 10 SLE patients [1]. The diagnosis of Libman Sacks endocarditis becomes challenging, especially in differentiating it from infective endocarditis as both diseases may present similarly.

There is an increased frequency of thromboembolic events among SLE patients in the setting of Libman Sacks endocarditis and antiphospholipid syndrome (APS) [2]. This case report presents a female SLE patient with the above complications, confounded by the clinical setting of infective endocarditis.

## Case Report

The patient is a 33 year-old Filipino female, diagnosed with SLE 5 years ago when she initially presented with symptoms of arthritis, alopecia, malar rash, and fever. Work up showed positive antinuclear antibody (ANA), anti-dsDNA, anti-Ro, anti-La, and slightly depressed serum complement levels. She was started on prednisone 30mg/day tapered and maintained at 5mg/day and hydroxychloroquine 200 mg/day. She was clinically stable for the next 5 years.

She had recurrent throat infection and gingival infections within the past year, which were treated with antibiotics. For the past 2 weeks, she had intermittent fever and progressive diplopia. Upon admission, vital signs were stable and physical examination findings reveal right lateral rectus and left medial rectus palsy, grade 3/6 holosystolic apical murmur, and livedo reticularis. Fundoscopy was normal. Motor, sensory, and deep tendon reflexes on all extremities were intact. There was no sign of active dental infection. Hemoglobin (Hgb) was 9.2 g/dl, hct 27, white blood cells (WBC)  $11.4 \times 10^9/l$  (segmenters 90, lymphocytes

10), platelet  $241 \times 10^{12}/l$ ; erythrocyte sedimentation rate (ESR) 130 mm/h, urinalysis RBC 0-2, pus 6-8, no casts. Complement factor-3 (C3) 0.89 g/l, C-reactive protein (CRP) 123.94 mg/l, anti-nuclear antibody (ANA) (1:160), anti-dsDNA (1:10), anti-cardiolipin IgG (36.44 GPL) antibody and lupus anti-coagulant (LA1 140.5 sec, LA2 48.4 sec, LA1/LA2 ratio 2.56) were positive. Cranial magnetic resonance imaging (MRI) was performed and showed small subtly enhancing foci in the mid-anterior aspect of the medulla, mid-pontomedullary region and left anterior midbrain (Figure 1). Electromyography (EMG), nerve conduction velocity (NCV) and cerebrospinal fluid analyses were normal. Dexamethasone was started at 5 mg/IV q6 hours then shifted to oral prednisone 40 mg/day after 3 days. Hydroxychloroquine was also continued.

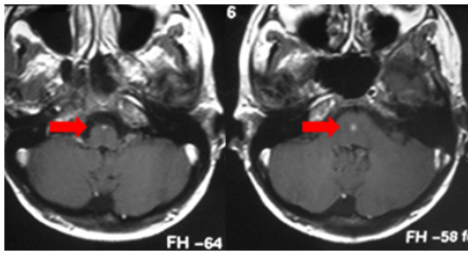
Two-dimensional echocardiogram showed mitral valve thickening with consideration of vegetation (Figure 2). Transesophageal echocardiogram was done which showed echodense structures on the mitral valve consistent with vegetation or Libman Sacks endocarditis (Figure 3). She was started on Penicillin G 5 MU/IV every 6 hours and Gentamycin 50 mg/IV every 8 hours. Blood cultures on 3 sites were

\*Corresponding author: Michael Thomas E Salvador, Rheumatology and Clinical Immunology, University of Santo Tomas Hospital, Manila, Philippines, USA, E-mail: [salvador\\_mako@yahoo.com](mailto:salvador_mako@yahoo.com)

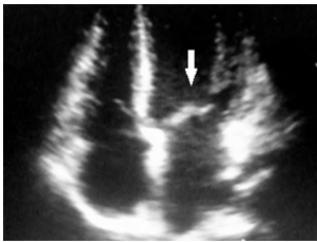
Received May 22, 2013; Accepted June 17, 2013; Published June 25, 2013

Citation: Salvador MTE, Navarra SV (2013) Infective Versus Libman Sacks Endocarditis In Systemic Lupus Erythematosus. Rheumatol Curr Res S16: 003. doi:10.4172/2161-1149.S16-003

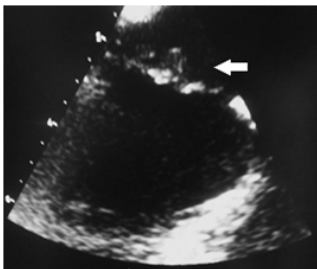
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**Figure 1:** Cranial MRI showing enhancing foci in the anterior aspect of the medulla, ponto-medullary region, left anterior midbrain.



**Figure 2:** 2D-Echo showing mitral valve thickening.



**Figure 3:** TEE showing mitral valve vegetation.

done; all 3 specimens did not grow any organism. Anticoagulation therapy was started using low-molecular weight heparin, tinzaparin.

She remained afebrile throughout the hospital stay and her diplopia progressively improved. Penicillin and gentamycin were continued for 2 weeks. Tinzaparin was continued maintaining international normalized ratio (INR) of 2 to 3, then shifted to warfarin. Prednisone and hydroxychloroquine were continued. Cranial MRI was repeated after 3 weeks which showed normal result.

## Discussion

This patient presented with symptoms of cerebrovascular disease, confirmed by cranial MRI. She also presented with a heart murmur suggestive of cardiac valvular disease also confirmed by ultrasonographic studies. Work up also revealed positive anticardiolipin IgG and lupus anticoagulant. She was treated as cerebral thromboembolic disease with anticoagulation. In the setting of SLE, antiphospholipid syndrome was considered.

With the background of recurrent throat and gingival infection within the past year and history of fever in the immediate past, the diagnosis of infective endocarditis had to be considered. With the echocardiographic finding, she fulfilled 1 major criteria for infective endocarditis. The history of fever and embolic event may be considered

as minor criteria making the diagnosis of possible infective endocarditis [3]. The dilemma then was whether to treat for infective endocarditis or not.

Libman Sacks endocarditis was first described by Emanuel Libman and Benjamin Sacks in 1924 [4]. It is also known as verrucous, marantic, or non-bacterial thrombotic endocarditis. The lesions primarily consists of accumulations of immune complexes and mononuclear cells. These subendothelial deposits may eventually lead to deformed valves. The most commonly involved valve is the mitral valve followed by the aortic valve. Libman Sack lesions are associated with lupus duration, disease activity, anti-cardiolipin antibodies, and antiphospholipid syndrome [5]. Cerebral thromboembolism remains to be the most common complication of antiphospholipid patients with Libman Sacks endocarditis [6].

Characteristic valvular pathology can also distinguish infective endocarditis vegetations from Libman Sacks endocarditis but this may not always hold true as vegetative lesions may evolve throughout the course of the disease. Infective endocarditis is characterized by large, irregular masses on the valve cusps that can extend onto the cords. Libman Sacks endocarditis has small or medium-sized vegetations on either or both sides of the valve leaflets [7]. The vegetations seen on the patient's echocardiogram were on the anterior and posterior mitral valve leaflets but the exact size and extent of involvement on the leaflets could not be distinguished.

Laboratory parameters can also be useful in distinguishing infective endocarditis from Libman Sacks endocarditis. An article by Menard emphasized 3 laboratory tests namely, white blood cell (WBC) count, c-reactive protein (CRP), and antiphospholipid antibody level [8]. WBC is expected to be low in SLE flare and elevated in infection. CRP is usually significantly elevated in infection, although some elevation may also be seen in SLE disease activity. Elevated antiphospholipid antibody titer is also more suggestive of SLE rather than infection. The patient's laboratory work-up showed markedly elevated CRP, slightly elevated WBC count, and positive antiphospholipid antibodies.

With the patient having fulfilled a possible infective endocarditis by criteria, and elevated CRP and WBC levels. She was given a regimen of penicillin G and gentamycin. Libman Sacks endocarditis was likewise addressed with anticoagulation using low-molecular weight heparin and warfarin. Clinical improvement was noted during hospital stay with completion of antibiotics, tapering of steroids, and continued anticoagulation. Echocardiographic studies have yet to be repeated as of writing this article.

## Conclusion

This case highlights the challenges in clinically differentiating infective endocarditis from Libman Sacks endocarditis in a patient with risk factors for both conditions. She received empiric treatment for both with favourable outcome. In cases such as this, it may be prudent to treat both conditions with the recommended antibiotic regimen and prolonged anticoagulation.

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This article was originally published in a special issue, **Orthopedics and Rheumatology: Case Reports** handled by Editor. Dr. Evan Silverio Vista, St. Luke's Medical Center and College of Medicine Manila, Philippines