Mitral Valve Repair for Isolated Libman-Sacks Endocarditis in a Patient with Primary Antiphospholipid Syndrome

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Summary

Libman-Sacks endocarditis, characterized by verrucous vegetations formation, is a typical cardiac manifestation of autoimmune diseases such as systemic lupus erythematosus (SLE) and antiphospholipid syndrome (APS). Although typically mild and asymptomatic, Libman-Sacks endocarditis can lead to serious complications, including thromboembolic events, superimposed bacterial endocarditis, and severe valvular regurgitation and/or stenosis, and valve surgery may be required. Here, we report a case of mitral valve repair for a large Libman-Sacks vegetation in a 29-year-old woman with a history of APS with cerebral infarction. Transesophageal echocardiography (TEE) demonstrated an isolated large mobile vegetation on the atrial side of posterior mitral valve leaflet, with severe mitral regurgitation. Next, we organized a multidisciplinary team meeting to better evaluate the case before performing the surgery. To prevent further thromboembolic events, and due to the insufficiency of the mitral valve, the patient was accepted for mitral valve surgery, and she was discharged uneventfully 10 days after successful surgery. She was managed with long-term anticoagulation medicine after surgery and followed up for 2 years with no complications. The present case showed mitral repair is feasible and effective in young female patients of child-bearing age, and the lesion only localized mitral valve abnormalities caused by Libman-Sacks endocarditis.

Key words: Autoimmune diseases, Mitral regurgitation, Transesophageal echocardiography

In 1924, Libman and Sacks originally reported four systemic lupus erythematosus (SLE) cases with verrucous vegetative endocarditis, and that was the first introduction of Libman-Sacks endocarditis (LSE). Nowadays, LSE has been seen as a typical cardiac manifestation of autoimmune diseases such as SLE/antiphospholipid syndrome (APS). Libman-Sacks vegetations can be complicated with embolic cerebrovascular disease, peripheral arterial embolism, severe valve regurgitation, superimposed infective endocarditis, need for high-risk valve surgery, and increased mortality. Here, we report a case of mitral valve repair for a large Libman-Sacks vegetation in a 29-year-old woman with a history of APS with cerebral infarction.

Case Report

A 29-year-old woman was referred to our hospital because of dyspnea and dizzy for the past one month. She exhibited a history of two consecutive first-trimester abortions over the past 3 years. Vital signs were normal. On cardiac auscultation, a grade 3/6 apical pansystolic murmur was heard. The remainder of the physical examination was unremarkable. The chest X-ray and electrocardiogram examination were within normal limits. Rheumatological evaluation yielded a positive anti-β2 glycoprotein I IgG antibodies level of 153.5 SGU (0-20.0 SGU) and elevated IgG anticardiolipin antibody level of 32.0 GPL (0-15.0 GPL). However, testing for antinuclear antibody, anti-double-stranded DNA antibody, IgM anticardiolipin antibody and lupus anticoagulant yielded negative results. The levels of CRP, BNP, troponin, myoglobin, creatine kinase, and D-Dimer were within normal limits, respectively. Her head computed tomography (CT) revealed that cerebral infarctions on the right paraventricular nucleus (Figure 1).

Transesophageal echocardiography (TEE) demonstrated that a large single mobile vegetation with size of 10 × 9 mm on the atrial side of posterior mitral valve leaflet, with irregular borders and heterogeneous echo-density, without annular calcification and subvalvular apparatus disease (Figure 2A). Further, real time 3-dimensional (RT3D) TEE showed that a mass attached to the surface of P2 section of posterior leaflet (Figure 2B). In addition, severe mitral regurgitation was noted by color Doppler imaging (Figure 2C). Repeated blood cultures were negative, and no evidence of infectious endocarditis was present. To facilitate better evaluation to come up with an optimal surgical protocol, we organized a multidisciplinary team meeting, which included a cardiovascu-
lar surgeon, an imaging cardiologist, obstetrics, gynecology, and a collagen disease specialist. Based on her clinical history, laboratory examination results and the echocardiographic appearance, Libman-Sacks endocarditis (LSE) of mitral valve was considered as an alternative diagnosis. To prevent further thromboembolic events and due to the insufficiency of mitral valve, the patient was accepted for mitral valve surgery. A median sternotomy with routine cardiopulmonary bypass (CPB) was performed, cardiac arrest was obtained by antegrade and retrograde cold blood cardioplegia. Considering the patient was suffered from the collagen disease, for the heparinization protocol, we perform the administration of heparin with the dose of 400 IU/kg to reach an ACT up to 480 seconds before CPB. The time of CPB was 93 minutes, and the time of aortic clamping was 74 minutes. Intraoperative inspection showed a large mass like mulberry on the atrial side of the P2 section of the posterior mitral valve leaflet but otherwise surprisingly normal leaflets without thickness and fibrosis (Figure 3A, B). So, after the vegetation was excised as completely as possible, a resection of partial P2 section of the posterior mitral valve leaflet was performed, followed by implantation of a 28 mm Edwards annuloplasty ring. Pathologic examination revealed that the masses were vegetations composed of myxoid degeneration and fibrin-platelet thrombi, a variable extent of inflammation with mononuclear cell infiltration, cholesterol crystal and focal calcification, compatible with a diagnosis of LSE (Figure 4). The postoperative course was uneventful, and she was discharged 10 days after successful surgery. Next, she was subscribed with long-term anticoagulation medicine of warfarin for 6 months after surgery and then changed to aspirin in outpa-

Figure 1. Head computed tomography (CT) image of this patient. The head CT image showing that cerebral infarctions on the right paraventricular (yellow arrow).

Figure 2. Preoperative and postoperative echocardiographic images of this patient. A: Transesophageal echocardiography showing a large vegetation (white arrow) adhere to the atrial side of posterior mitral valve leaflet. B: 3D-TEE LA view demonstrating the isolated large vegetation (red arrow) on the P2 section of the posterior mitral valve leaflet. C: Color Doppler imaging reveal severe mitral regurgitation (white triangle) before surgery. D: Transthoracic echocardiographic follow-up reveals mild mitral regurgitation (white triangle) after surgery. 3D-TEE indicates 3-dimensional transesophageal echocardiography; RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle; and LAA, left atrial appendage.
Patient, and the target INR was at about 2.0-3.0. Echocardiographic follow-up revealed mild mitral regurgitation and normal left ventricle function (Figure 2D). She was followed up for 2 years, and her condition was stable.

Discussion

APS is an autoimmune hypercoagulable disorder characterized by thrombophilia, vascular thrombosis, and recurrent pregnancy loss associated with persistent antiphospholipid antibodies. While APS can be a primary syndrome, it is usually secondary to SLE. Cardiac involvement is not an uncommon complication in APS patients with LSE. Libman-Sacks vegetations are strong independent risk or pathogenic factor for stroke or TIA, focal brain lesions, or cognitive disability. In our case, focal cerebral infarctions were present on the right paraventricular by head CT, though she presented with no remarkable sighs of nervous system. The origin of these lesion is very closely related to the presence of antiphospholipid antibodies, which interfere with coagulation profiles of the patients affecting the partial thromboplastin time and thrombin time, hence the risk of embolic events. Robust data were present, suggesting that patients with antiphospholipid antibodies (both lupus anticoagulant and/or immunoglobulin G anticardiolipin antibodies) exhibit a
threelfold risk for developing LSE, compared with those without antiphospholipid antibodies. The laboratory results of our patient showed a hypercoagulability profiles with high level of anti-β2 glycoprotein I antibodies and antiphospholipid antibody, which is consistent with the conditions.

Nowadays, the exact pathogenesis of LSE is still unclear. However, LSE has been assumed to involve the formation of fibrin-platelet thrombus and myxoid degeneration on the altered valve, the organization of which leads to valve fibrosis, edema, diffuse thickening, and mild inflammatory changes infiltration of the mononuclear cell. As to our patient, rather than playing a more direct pathogenic role, antiphospholipid antibodies are thought to promote thrombus formation on the endotheium of valves already compromised by immune complex deposition, leading to further valvular damage. As our finding of microscopic pathologic examination; valvular lesions change over time, and the end-stage or healed form of LSE is a fibrous plaque, with mononuclear cell infiltration, cholesterol crystal, and focal calcification. We speculated that the mononuclear cell demonstrates phagocytosis of tissue around it, and then, the disintegration products formed cholesterol crystal, which would increase the instability. So, the Libman-Sacks vegetations will be apt to fall off and result in thromboembolic events.

Patients with APS, especially young female adults, mostly affect the left side valve. They usually need an operation when the heart valve disease is severe enough. The present case presents a history of two consecutive first-trimester abortions, indicating the presence of APS. Meanwhile, our patient is a young woman and is eager to conceive a baby in the near future. Thus, her mitral valve lesion should be treated carefully. Libman-Sacks vegetations are typically small, sessile, and wart-like, varying in size from 1–4 mm. Few data exist in the literature describing large Libman-Sacks vegetations. However, these large vegetations can be further complicated with severe valve dysfunction, result in heart failure, and a need for high-risk valve surgery. Therefore, early and accurate detection of Libman-Sacks vegetations using TEE may lead to early therapy and prevention of the development or progression of their associated complications. In our case the diagnostic role of TEE, especially RT3D TEE, was also highlighted, which might be more sensitive to assess special vegetation shape and size. Treatment options can be broadly divided into medical management and operation. Current therapeutic guidelines for APS suggest long-term anticoagulation therapy, which may lead to unexpected embolism-bleeding events and bring harassments for female menstruation and pregnancy. To the present case, intraoperative inspection revealed that large vegetation was present on the posterior mitral valve leaflet but otherwise surprisingly normal leaflets without thickness and fibrosis and subvalvular apparatus were not involved, which provided the chance of mitral valve repair. Therefore, mitral valve repair was considered after the vegetation was excised as completely as possible. She was discharged uneventfully 10 days after successfully surgery. For the avoidance of thromboembolic complications, postoperative medical management with long-term anticoagulation therapy is necessary for patients with APS with valve surgical intervention. To our patient, she was taken with warfarin at the first 6 months after operation and then changed to aspirin, and the target INR was at about 2.0–3.0. Lastly, her condition was stable for the 2 years’ follow-up.

Conclusion

LSE should be strongly suspected when significant valve vegetation unveiled during the course of APS. TEE, especially RT3D TEE, is useful for diagnosis LSE caused by SLE and/or APS. When severe symptomatic mitral regurgitation presented, surgery for mitral valve should be considered. Present case showed that mitral repair is feasible and effective in female patients of child-bearing age and the lesion only localized mitral valve abnormalities caused by LSE.

Disclosure

Conflicts of interest: None.

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