Axillary artery thrombus and infective endocarditis in lupus

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Abstract

Systemic lupus erythematosus is a chronic systemic autoimmune disease, often associated with severe infection. A female patient was referred for surgical treatment of infective endocarditis after being treated for systemic lupus erythematosus and lupus nephritis. She developed symptoms of left axillary artery occlusion before heart operation. Bulky fungal hyphae were noted on pathological examination of the surgically removed thrombi. The patient had an uncomplicated recovery after receiving high doses of antibiotics and subsequent mitral valve replacement. Either infective endocarditis or fungal thrombi may be secondary to systemic lupus erythematosus and impaired renal function.

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1. Introduction

Systemic lupus erythematosus (SLE) is a chronic systemic autoimmune disease, with the synovial joints and the cardiovascular system being the most frequently affected targets. Valvular and renal diseases are common in SLE and can result in marked hemodynamic dysfunction. Impaired cardiac valves resulting from the presence of Libman–Sacks lesions are prone to hemodynamic changes and may place patients at risk of developing infective endocarditis. Infective endocarditis is a well-known superimposed complication of active or healed Libman–Sacks endocarditis in patients with SLE. The recurrent valvulitis and thrombosis in patients with SLE are more likely to cause valve thickening and valve dysfunction that require surgical treatment than in those with rheumatic heart disease.

2. Case report

A 35-year-old woman presented with intermittent turgid limbs and alopecia of 1 year’s duration; intermittent high fever for 2 months; abnormal urinary checkup results [urinary protein was 0.58 g/24 h (2+), and the red blood cells of the urinary sediment were polymorphic, with a count of 7.65 x 10^6/mL]; decreased hemoglobin (5.9 g/dL); reduced complements; and elevated globulin [35.4 g/L (normal, 20–30 g/L)]. She was referred to the nephrology department of our institute.

Immunological studies showed positivity for antinuclear antibody (titer, 1:64); antiphospholipid–IgM antibodies; proteinase 3–antineutrophil cytoplasmic antibodies; and rheumatic factor. The patient’s cluster of differentiation 4 cell count (CD4) was 250/μL. Relative biomarkers were interleukin-18 of 205.60 ng/mL; decreased hemoglobin (5.9 g/dL); reduced complements; and elevated globulin [35.4 g/L (normal, 20–30 g/L)]. She was referred to the nephrology department of our institute.

Kidney ultrasound demonstrated normal sizes of both kidneys (left, 116 x 40 x 58 mm; right, 109 x 47 x 54 mm);
slightly increased cortical echo texture; and ambiguous cortical thickness and corticomedullary junction. She was diagnosed with SLE associated with nephritis, Type II diabetes mellitus, and hemolytic anemia. After a recent 1-month treatment with antibiotics, corticosteroids, and acarbose, in the nephrology department of our institute, severe mitral valve insufficiency developed. She was noted, by echocardiography, to have infective endocarditis with vegetation on the atrial surface of the mitral valve (Fig. 1A), mild pericardial effusion, and an elevated pulmonary artery pressure of 74 mmHg. Gram-positive streptococci were isolated from blood cultures. She, thus, received antibacterial treatment of moxifloxacin hydrochloride and sodium chloride injection (Bayer HealthCare AG, Beijing, China) 0.4 g once a day (QD) for 6 days before she was transferred to the department of cardiothoracic surgery for surgical treatment.

On admission, physical examinations showed an ill-nourished slim woman lying in bed. There were no râles over both lungs, but a 3–4/6 systolic murmur was audible at the apex. There was no hepatomegaly, splenomegaly, or dermal bleeding. The patient’s white blood cell count was 13.3 × 10^9/L; neutrophils, 77%; lymphocytes, 15%; hemoglobin, 92 g/L; and platelets, 205 × 10^9/L. Blood gas analysis showed the following: pH, 7.51; PCO_2_, 34 mmHg; and PO_2_, 82 mmHg. Her C-reactive protein was 22 (normal, <8) mg/L, and globulin was 35.9 g/L. Electrocardiogram illustrated sinus rhythm with a heart rate of 110 beats/min, low voltage, ventricular premature, P-R interval (P-R) 126 ms, and RV_1/SV_1 1.14/1.03 mV.

Periodic acid methanamine (PAM) (Fig. 2 C), but negative bacteria. Histological examinations of the surgical specimens demonstrated old thrombi with patchy necrosis and calcification, infiltrated by a large amount of inflammatory cells, among which bulky fungal hyphae could be seen (Fig. 2 A). Special stainings resulted in positive Periodic Acid Schiff (PAS) (Fig. 2 B) and positive Periodic Acid Methanamine (PAM) (Fig. 2 C), but negative bacteria.

Two days later, the patient underwent an open-heart surgery, by which mitral valve replacement and De Vega annuloplasty of the tricuspid valve were performed. Microbiological analysis of the excised mitral valve along with the vegetations did not show any bacterial growth. Histological examinations of the mitral valve specimen showed mucoid degeneration of the collagen with inflammatory cell infiltrations (Fig. 2 D). The patient received fluconazole (Diflucan) (PFIZER PGM, Poc sur Cisse, France) 0.2 g QD, cefoperazone sodium and sulfactam sodium for injection (Haikou Qili Pharmaceutical Co., Ltd, Hainan, China) 1.5 g once per 12 hours, teicoplanin (Gruppo Lepetit S.r.l., Milan, Italy) 0.2 g QD, and warfarin (Shanghai Sine Pharmaceutical Co., Ltd, Shanghai, China) 1.25 mg QD until 2 months after discharge.

3. Discussion

Patients with SLE have shown more frequent valve thickening than valve masses or vegetations. Valvular regurgitation has been reported in 74% of such patients. Among them, 7–41% had moderate or severe regurgitation, whereas valvular stenosis, usually accompanied by regurgitations, was seen in only 3–4%. The valvular disorders resulting from Libman–Sacks lesions may predispose patients to bacterial endocarditis. The incidence of infective endocarditis in SLE in a study of 275 patients was only 0.4%, and the valvular disorders were...
present in 3.3–4.4% of the study population. The valve involvement in chronic SLE was found to be similar to that of chronic rheumatic disease.

Panchal et al. reported an autopsy series of 35 patients with SLE; infective endocarditis occurred in 1 (3.7%), and thromboses/embolism occurred in 9 (33.33%). These patients were young, with a mean age of 23.29 years, and all had received corticosteroids. Kron et al. noted that 9.8% of SLE patients developed cerebral microemboli. Montes de Oca et al. described 16 thrombotic episodes in SLE patients; 14 involved the leg veins and four were pulmonary embolisms. Besides, the cerebral arteries were affected in two of the 16 thrombotic episodes. Arterial embolism formed by the fungi was very rare. It was suspected that uncontrolled diabetes or iatrogenic maneuvers, such as biopsy or venous injections, may contribute to the development of such embolism.

In this patient, the coagulation disorder due to lupus nephritis may be responsible for the development of the left axillary artery thrombosis. In addition to the cardiac vegetations identified by echocardiography, this patient had mild pericardial effusion. The surgical indications for open femoral artery were to prevent arm ischemia and continuous vegetation detachment. With antibiotic treatments, the patient’s condition was stable, and she finally recovered and was discharged home. She was recommended for continuous antibiotic agents. She was doing well at 2-month follow-up after the operation.

In this case, it seems that infective endocarditis developed on the basis of SLE, lupus nephritis, lupus medications, and associated mitral valve dysfunction, as described elsewhere. It was more likely that she had an infective endocarditis rather than Libman–Sacks syndrome, as the latter is usually characterized by warty lesions near the heart valves, often at the base of the mitral valve. Other features of such lesions may include lower frequency of affecting valvular function, presence of basophilic cellular debris, and poor responsiveness to antibiotic treatment, which were not found in this patient. The axillary occlusion was because of old embolization but not de novo, which was evidenced histologically where the thrombi were composed of old clots. It had to take a longer time for the development of patchy necrosis, calcification, and fungal hyphae among the thrombi. Moreover, there was no evidence of new thrombus formed by fresh clots or vegetation debris. The formation of the axillary artery emboli can be multifactorial, with impaired immune and renal functions being the major potential contributing factors. Timely surgical interventions with high doses of antibiotics are essential for such patients with severe infections. For preventive purposes,

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prophylactic antibiotics are advised for minor surgical procedures with an increased risk of transient bacteremia.

References