Case Report

Embolic Complications of a Mitral Valve Rheumatoid Nodule

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ABSTRACT. We describe a patient with a rheumatoid nodule on the mitral valve who developed embolic phenomena from an overlying thrombus. It is important to recognize that thrombus can develop on intracardiac rheumatoid nodules and that these patients may require anticoagulation. (J Rheumatol 2004;31:1001–3)

Key Indexing Terms:
RHEUMATOID NODULE MITRAL VALVE EMBOLISM THROMBUS

Rheumatoid nodules are present in roughly 25% of cases of definite or classic rheumatoid arthritis (RA)[1-3] and can occur in all parts of the heart, including the pericardium, epicardium, myocardium, endocardium, atrium, interventricular septum, and all valve cusps and rings (predominantly mitral and aortic valve)[4,5]. Our case illustrates the thromboembolic complications of a mitral valve rheumatoid nodule in a patient with seropositive RA.

CASE REPORT

Clinical findings. A 70-year-old man presented to the hospital with transient dysarthria, left hand weakness, and a pulseless, cool and painful right leg. His medical history included seropositive nodular RA of 20 years' duration, hypertension, diabetes mellitus type 2, and peptic ulcer disease. There was also a history of palpitations, but no documented arrhythmias. His medications were prednisone 5 mg bid, celecoxib, omeprazole, nifedipine, metoprolol, and acetaminophen prn. He had failed multiple disease modifying antirheumatic drugs in the past and was being considered for anti-tumor necrosis factor therapy.

While having dinner, he had a transient episode of dysarthria, drooling, and peri-oral numbness associated with weakness, clumsiness, and numbness of the left hand. A few minutes after these symptoms had resolved, he developed pain and burning of his right leg. He was brought to hospital.

At the time of hospital admission, the neurological examination was normal. He was in normal sinus rhythm and there were no heart murmurs. A left carotid bruit was noted. The right leg was cool and the femoral and pedal pulses were diminished. Chronic changes of RA were present, with multiple rheumatoid nodules. He had moderate active synovitis.

Electrocardiogram (ECG) confirmed normal sinus rhythm, but there was an incomplete right bundle branch block (RBBB) pattern. Computed tomography of the head was normal. Carotid duplex was normal. An angiogram of the right leg revealed an occlusion of the right profunda femoris and superficial femoral artery. A subsequent embolectomy revealed a thrombus with no other tissue present on pathologic examination.

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Transthoracic and transesophageal echocardiography were performed and showed a large (12 × 15 mm) mobile lesion attached to the posterior leaflet of the mitral valve, which was prolapsing into the left ventricle (Figure 1). The pedunculated tumor mass was excised and the mitral valve was repaired with native pericardium. A coronary artery bypass was also performed since the angiogram had revealed coronary artery disease.

Pathological examination of the excised mitral valve lesion revealed granulomatous inflammation, central fibrinoid necrosis, and surrounding histiocytes, which were consistent with a rheumatoid nodule (Figure 2). An overlying thrombus was also seen. He subsequently began longterm oral anticoagulation.

DISCUSSION

Rheumatoid nodules often occur at pressure sites; therefore, trauma appears to play a role in their development[1]. Rheumatoid factor complexes may also be involved in the pathogenesis, since almost all patients who develop nodules are rheumatoid factor positive. The mature rheumatoid nodule has a characteristic structure. The center is composed of necrotic fibrinoid material with a surrounding layer of radially oriented or pallisaded mononuclear cells believed to be mainly macrophages[6,7]. The mitral valve lesion excised from our patient had this same characteristic structure.

It has been hypothesized that repeated trauma over bone may lead to recurrent small hemorrhages, and that in seropositive individuals, this may result in the local collection of serous fluid containing rheumatoid factor complexes[5]. These immune complexes may activate macrophages and induce chronic inflammation, vascularity, fibrin deposition, and chemotaxis of monocytes characteristic of the rheumatoid nodule[5].

The pathogenesis of rheumatoid nodules on heart valves is unknown. Valvular rheumatoid nodules are a rare finding; however, recent echocardiographic studies show that valvular heart abnormalities, particularly mitral regurgitation (MR), may be more common in RA patients[8,9]. In a case-control transesophageal echocardiography study of 30 patients, 24 (80%) patients with RA and only 11 (37%) control patients had asymptomatic MR[8]. Further, Wislowska

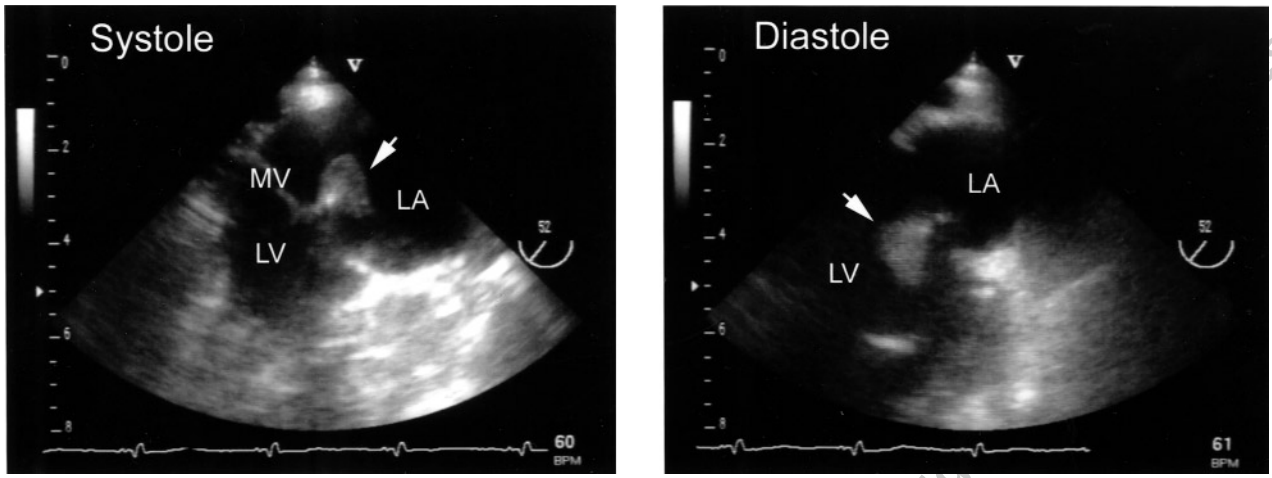

Figure 1. Transesophageal echocardiogram. A large 12 × 15 mm mobile lesion (arrowhead) is attached to the posterior leaflet of the mitral valve. In diastole it is prolapsing into the left ventricle. LA: left atrium, LV: left ventricle, MV: mitral valve, arrowhead: rheumatoid nodule.

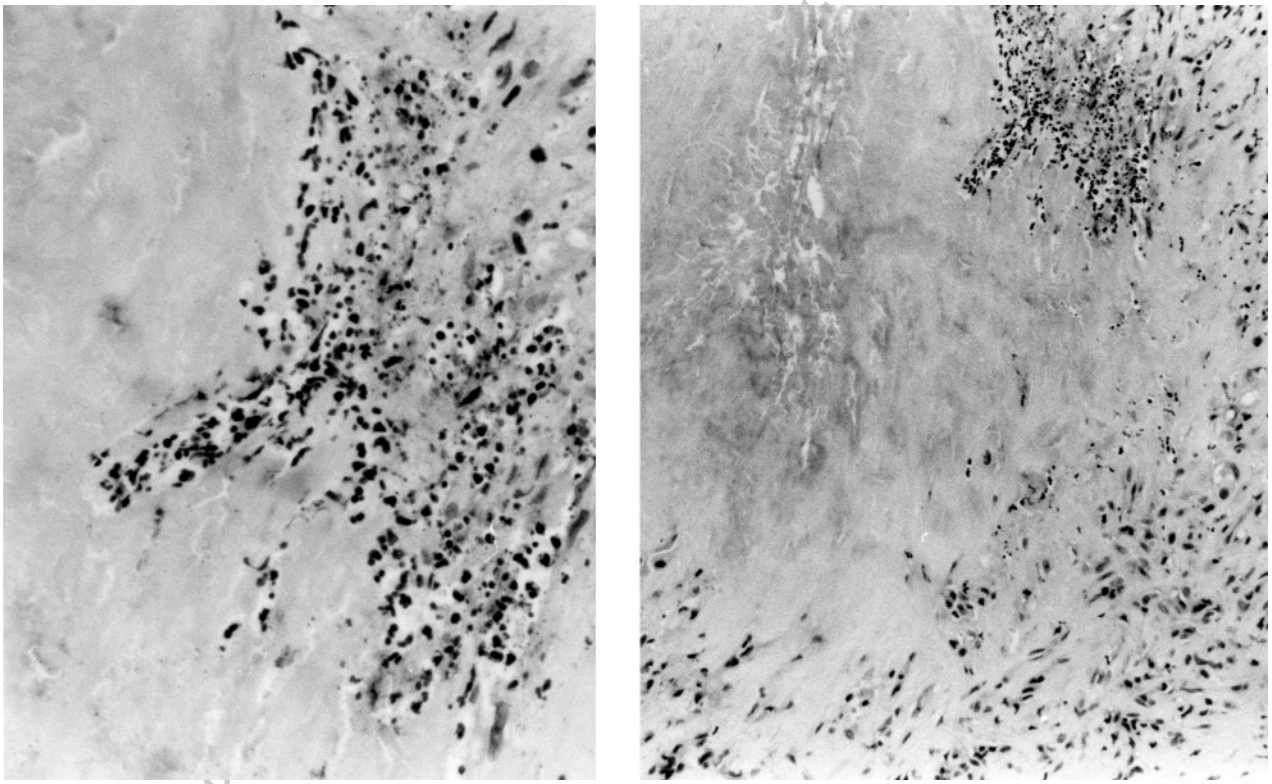

Figure 2. Right panel: Edge of rheumatoid nodule with central necrosis (upper left) and mixed cellular inflammation with elongated fibrohistiocytic nuclei (right and lower border) (H&E, magnification 40×). Left panel: Focus of inflammatory cellular leukocytoclasis adjacent to necrosis (H&E, magnification 250×).

and colleagues were able to demonstrate more valvular heart abnormalities (especially MR) in nodular RA patients versus non-nodular RA patients[9]. One could postulate that mitral valve regurgitation is a potential stimulus for rheumatoid nodule formation on the mitral valve.

Our patient also had an incomplete RBBB. Moreover, he had coronary artery disease, so that it is possible that the RBBB was also due to cardiac rheumatoid nodule formation.

Complete and incomplete heart block have been described in RA[10] and when histopathology was available, the characteristic finding of a granuloma in or near the AV

node of the His bundle has been seen[11]. Infiltration of the conducting system with lymphocytes, plasma cells, and histiocytes has also been described[11]. The right bundle branch may be involved more frequently because it is narrower and more compact, and therefore more vulnerable to be damaged by focal lesions such as a rheumatoid nodule.

Our patient had presented with 2 embolic phenomena (transient ischemic attacks and thromboembolism to the right leg) from the development of a thrombus overlying a mitral valve rheumatoid nodule. We performed a Medline search using the key words rheumatoid nodule, cardiac, valve, mitral, embolism, thrombus, and stroke, and found only 2 reported cases of embolizing rheumatoid nodules from cardiac valves[12,13]. In these cases, the embolus consisted of rheumatoid nodule tissue. However, to our knowledge, thromboembolic phenomena from an overlying thrombus on an intracardiac rheumatoid nodule have not been described.

Since we were uncertain whether a nidus of granulation tissue on the mitral valve had been fully removed during surgery, the potential for a recurrent rheumatoid nodule and thrombus was still present. Consequently, the decision was made to start our patient on prophylactic anticoagulation. He will also be followed with regular ECG to monitor the incomplete RBBB.

As rheumatologists we have become increasingly aware of the increased cardiovascular risks in patients with RA[14]. Our case illustrates that patients with seropositive RA may develop intracardiac rheumatoid nodules, which may stimulate the formation of an overlying thrombus and possible embolic sequelae. Consequently, all patients with RA, particularly seropositive patients, should have regular cardiac evaluations, with baseline ECG. Echocardiogram should be considered not only in the setting of possible thromboembolic phenomena but also if there are abnormalities on physical examination suggesting valvular heart disease or ECG conduction abnormalities.

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