Mitral valve aneurysm associated with aortic valve regurgitation

Aort kapak yetersizliğine eşlik eden mitral kapak anevrizması

Öykü Gülmez, M.D.,[1] Leyla Elif Sade, M.D., Aylin Yıldırır, M.D., Haldun Müderrisoğlu, M.D.

[1]Department of Cardiology, Başkent University İstanbul Medical and Research Center, İstanbul;
Department of Cardiology, Medicine Faculty of Başkent University, Ankara

Mitral valve aneurysm (MVA) is uncommon and occurs most commonly in association with infective endocarditis involving the aortic valve. A 66-year-old man with anterior MVA is presented. Two-dimensional transthoracic echocardiography and transesophageal echocardiography revealed a saccular structure in the anterior mitral leaflet that bulged into the left atrium throughout the cardiac cycle, a localized aneurysmal lesion of the aortic valve, and severe mitral and aortic regurgitation. There were neither vegetations nor atrial thrombi and his medical record was not suggestive of any episode of infective endocarditis. The mitral and aortic valves were replaced with mechanical protheses. Pathologic examination of the excised valves showed inflammation and cultures were negative. The postoperative course was uneventful, and the patient was discharged on the fifth postoperative day. In this case, MVA is likely to result from previous infective endocarditis of the aortic valve leading to aneurysm formation and severe aortic regurgitation.

Key words: Aortic valve insufficiency; echocardiography; endocarditis, bacterial/complications; heart aneurysm/pathology/surgery; mitral valve/pathology.

Mitral kapak anevrizması nadirdir ve genellikle aort kapağında gelişen enfektif endokardit sonucu ortaya çıkar. Bu yazıda, 66 yaşında bir erkek hastada saptanan mitral kapak ön yaprakçık anevrizması sunuldu. İkiboyutlu transtorasik ekokardiyografi ve transözafageal ekokardiyografide, mitral kapak ön yaprakçığında, tüm kalp siklusu boyunca sol atriyuma bombeleşen sakküler bir yapı, aort kapağında anevrizmal lezyon ve ciddi mitral ve aort yetersizliği saptandı. Vejetasyon veya atriyal trombüs bulgusuna rastlanmadı. Hastanın öyküsünde geçirilmiş enfektif endokardit ile ilgili bir olay yoktu. Mitral ve aort kapaklar mekanik protez kapak ile değiştirildi. Çıkarılan kapakların patolojik incelemesinde enflamasyon izlendi. Örneklerin kültür sonuçları da negatif idi. Ameliyat sonrası dönemi olaysız geçiren hasta beşinci günde taburcu edildi. Hastadaki mitral kapak anevrizmasının, aort kapakta daha önce geçirilmiş enfektif endokardit sekeline bağlı anevrizmal oluşum ve ciddi aort yetersizliğinden kaynaklandığı düşünüldü.

Anahtar sözcükler: Aort kapağı yetersizliği; ekokardiyografi; endokardit, bakteriyel/komplikasyon; kalp anevrizması/patoloji/cerrahi; mitral kapağı/patoloji.

Mitral valve aneurysms (MVA) are uncommon and reported cases are rare. They occur most commonly as a consequence of infective endocarditis of the aortic valve.[1] The vegetative process leads to inflammation and softening of the underlying tissue, leading to aneurysm formation. Destruction of the aortic valve results in a regurgitant jet that strikes the anterior leaflet of the mitral valve, creating a secondary site of infection leading to the development of an aneurysm.[2]

We present a patient with MVA and severe aortic regurgitation without evidence for active endocarditis.

CASE REPORT

A 66-year-old man without a previous history of cardiac disease was referred to our hospital for valve replacement with the diagnosis of severe mitral and aortic regurgitation detected by transthoracic echocardiography. He had sustained chronic renal failure for one year due to uncontrolled hypertension, for which he had been receiving hemodialysis 3 days/week. His medical record was not suggestive of any episode of infective endocarditis. He did not have a recent history of fever and his laboratory findings did not point to any current infection. Moreover, his medical

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Correspondence: Dr. Öykü Gülmez. Baskent Üniversitesi İstanbul Sağlık, Uygulama ve Araştırma Merkezi Hastanesi, Kardiyoloji Kliniği, Oymacı Sok., No: 7, 34662 Altunizade, İstanbul, Turkey. Tel: +90 216 - 554 15 00 e-mail: gulmezoyku@gmail.com

record and physical examination did not provide evidence for any systemic complications of connective tissue disorders. A mild early diastolic murmur at the left lateral sternal border and a pansystolic murmur at the apex were detected on physical examination. Two-dimensional transthoracic echocardiography (Siemens, Acuson Sequoia, C216; transducer 3V2c-S, H3.5 MHz) demonstrated a saccular formation in the anterior mitral leaflet extending into the left atrium throughout the cardiac cycle with eccentric severe mitral regurgitation towards the atrial free wall, and a trileaflet aortic valve with severe aortic regurgitation. Transesophageal echocardiography showed severe aortic regurgitation with the aortic valve doming into the left ventricular outflow tract throughout diastole, confirming the presence of a localized aneurysmal lesion (Fig. 1a) and an anterior mitral valve aneurysm (Fig. 1b, c). There were neither vegetations nor atrial thrombi. The patient underwent mitral and aortic valve replacement with 27-mm and 25-mm bileaflet mechanical prostheses, respectively. At operation, the aortic valve appeared to be degenerated and an aneurysm-like formation could be seen on the right coronary cusp. Severe aortic regurgitation was present. The mitral valve was also severely damaged and an aneurysm of the anterior mitral leaflet with severe regurgitation was visualized. Pathological examination of the specimens revealed chronic inflammation and degenerative changes for the mitral valve, and extensive calcification, necrotic changes, and localized acute inflammation in one area of the aortic valve suggesting abscess formation. Cultures of the removed tissues were negative.

The postoperative course was uneventful, and the patient was discharged on the fifth postoperative day.

DISCUSSION

Mitral valve aneurysm is an uncommon but well-known complication of aortic valve endocarditis. Its incidence was found as 9.6% in a group of patients with a definite diagnosis of left-sided infective endocarditis.[3] A number of cases of mitral valve aneurysm have been reported in patients without a history of endocarditis, but these rare cases usually have connective tissue disorders, myxomatous valvular degeneration, Marfan syndrome, pseudoxanthoma elasticum, or physical stress due to severe aortic regurgitation.[4,5] Because the occurrence of MVA is rare in the absence of endocarditis, an infectious etiology is at least partly responsible for leaflet degeneration. The infection often involves the aortic valve and thereafter spreads via the regurgitant blood flow from

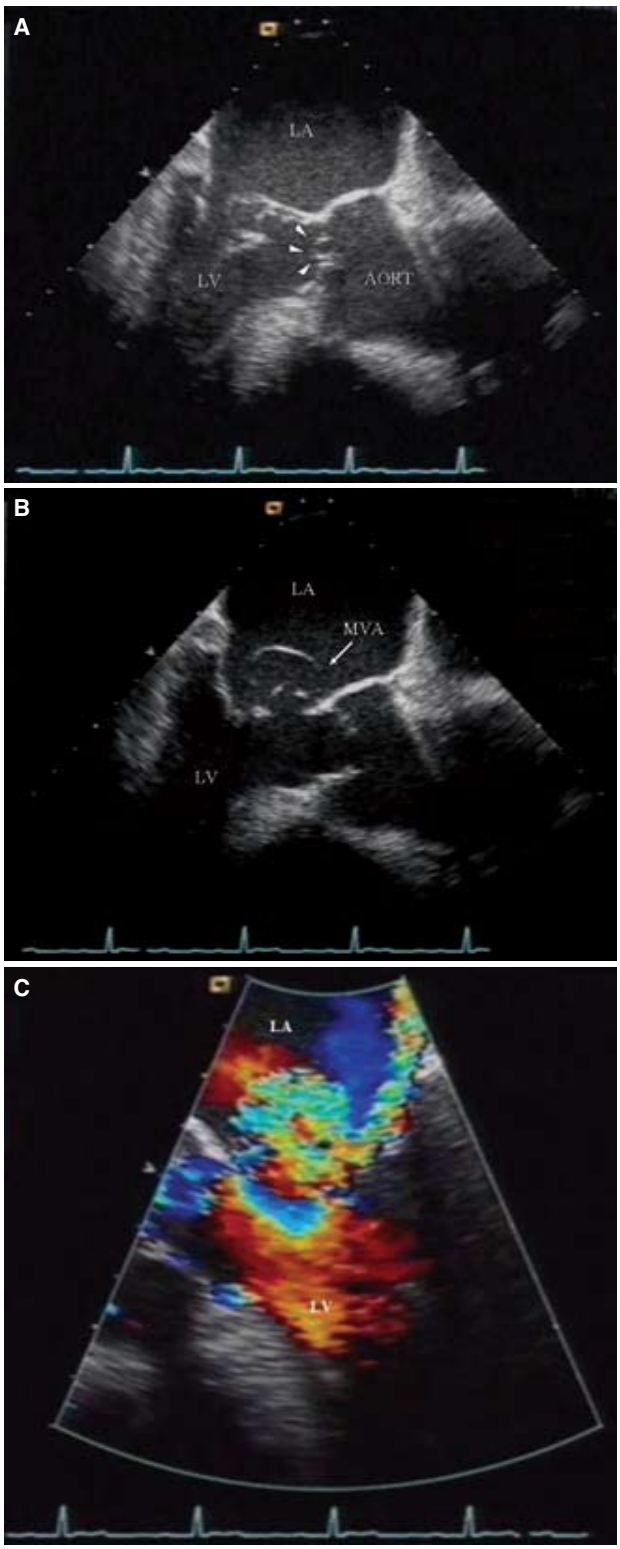

Figure 1. Transesophageal echocardiograms showing **(A)** aortic valve prolapsus (arrow heads) and **(B)** an aneurysm of the anterior mitral leaflet. **(C)** Color Doppler transesophageal echocardiogram showing regurgitant aortic insufficiency jet striking the anterior mitral valve leaflet. (LA: Left atrium; LV: Left ventricle; MVA: Mitral valve aneurysm)

the damaged aortic valve to the mitral valve.[2] Albeit much less common, direct extension of the infection along the mitral-aortic intervalvular fibrosa up to the anterior mitral leaflet is also possible.[6] Aneurysm of the posterior mitral valve appears to result from evolution of the primary infection of the mitral valve. In our patient, aneurysmal degeneration of the aortic valve associated with severe aortic regurgitation was likely to be due to a previous attack of infective endocarditis that caused inflammation and softening of tissue, leading to aneurysm formation. Considering the anatomic relationship between the aneurysm site and the aortic lesion, anterior mitral leaflet aneurysm was most probably caused by the aortic regurgitant jet that lashed the ventricular surface of the anterior mitral leaflet.

Transthoracic echocardiography is currently the initial and the most practical imaging modality. Transesophageal echocardiography is more sensitive.[7] Mitral valve aneurysm appears as a localized saccular bulge of the anterior leaflet into the left atrium, typically larger in systole than in diastole and also persists throughout the cardiac cycle.[3] The differential diagnosis should include mitral valve prolapse, flail mitral valve, myxomas involving the mitral valve, and mitral valve cysts without endothelization.[8] Careful two-dimensional examination and color flow Doppler help distinguish the aneurysm from these abnormalities by demonstrating direct communication between the aneurysm and the left ventricle.[9]

Early detection and prompt intervention are important to prevent the complications of valvular aneurysms which include rupture and embolism. Although the natural course of inflammatory aneurysms is not known, surgical intervention is indicated when aneurysm ruptures or when the unruptured aneurysm is large or accompanied by significant regurgitation as in our case.[3]

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