Mitral and aortic valve aneurysms secondary to infective endocarditis: impressive images of a rare echocardiographic finding

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Mitral and aortic valve aneurysms are uncommon, but the coexistence of both mitral and aortic valve aneurysms in the same patient is a rather unusual finding in the literature. We report a rare clinical case of a patient with both mitral and aortic valve aneurysms and a rupture of the mitral valve aneurysm, as the main echocardiographic manifestations of infective endocarditis. This clinical case emphasizes infective endocarditis as the most frequent cause of valve aneurysms, reminding that this diagnosis should be suspected even in the absence of vegetations. This case demonstrates that transoesophageal echocardiography plays a major role on diagnosis of valve aneurysms, revealing the rupture of the mitral valve aneurysm and defining this rupture as the main mechanism of mitral valve regurgitation. This case also underlines the role of transoesophageal echocardiography on management decisions, allowing a morphological evaluation of the mitral valve and selection of the appropriate surgical strategy.

Keywords
Aneurysm • Mitral valve • Aortic valve • Infective endocarditis

Case report
A 30-year-old male, with an unremarkable medical background, including no history of illegal drug abuse, was admitted in our hospital with a 3-month history of congestive heart failure. He presented fever, a diastolic murmur on the left sternal border and a systolic murmur on the left sternal border and apex. Left cardiac chambers dilation and left ventricular dysfunction were detected by transthoracic echocardiogram (TTE). Astounding images of a very large aneurysm on the anterior leaflet of the mitral valve and an aneurysm on the non-coronary cusp of the aortic valve were revealed by TTE (Figures 1A and B; see Supplementary data online, Video S1). Colour flow Doppler showed severe mitral and aortic regurgitation. The aortic regurgitant jet was directed towards the anterior leaflet of the mitral valve, filling in the mitral valve aneurysm (see Supplementary data online, Video S2). A fistula between the aortic root and the right ventricle was also observed (Figure 3). Transoesophageal echocardiogram (TEE) allowed the identification of a rupture on the mitral valve aneurysm and colour flow Doppler revealed a regurgitant jet passing through the aneurysm rupture towards the left atrium and causing severe mitral regurgitation (Figure 1C and D; see Supplementary data online, Video S3 and S4). Severe aortic regurgitation was also detected on TEE (Figure 4; see Supplementary data online, Video S5).

Infective endocarditis was suspected. As urgent beginning of antibiotic treatment was needed and causative microorganism was unknown, empiric treatment with vancomycin and gentamicin was started. Blood cultures revealed slow growth of Streptococcus species resistant to penicillin and susceptible to vancomycin. The patient was HIV negative. Serological tests to other bacterial agents were also negative. Medical therapy for heart failure was started and resulted in rapid clinical stabilization, avoiding an urgent surgery and allowing for 2 weeks of antibiotics before an elective surgery was performed. Valve aneurysms and the fistula were confirmed under direct examination and surgical procedure included replacement of mitral and aortic valves by mechanical prosthesis and closure of the fistula. Cultures of the native valves were negative to bacteria and fungus. After a 6 week-treatment of antibiotics, the patient was discharged asymptomatic and with preserved systolic left ventricular function.

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Discussion

Several particularities are met in this clinical case. First, valve aneurysms are rare echocardiographic findings and the coexistence of mitral and aortic valve aneurysms in the same patient is an uncommon finding in the literature.1,2 Second, this clinical case emphasizes infective endocarditis as the most common cause of valve aneurysms, underlining that the detection of valve aneurysms should raise suspicion of infective endocarditis, even when major echocardiographic criteria like vegetations or abscesses are not detected.3 In this case, infection probably started on the aortic valve and spreaded to the mitral valve by impingement of the
infective regurgitant aortic jet on the anterior leaflet of the mitral valve. Infection and subsequent healing may have weakened a portion of the mitral valve tissue, where the impact of the aortic regurgitant jet and left ventricular pressure may have led to the formation of such a large mitral valve aneurysm. Third, impressive and illustrative images of mitral and aortic valve aneurysms are provided by TTE and TEE.

Finally, this clinical case clearly enhances the role of echocardiography, particularly TEE, on management decisions. Optimal management of valve aneurysms is still controversial, although surgery is indicated when aneurysm rupture or severe regurgitation occur. In this case, severe mitral and aortic regurgitation were documented by TTE, but the identification of a rupture on the mitral valve aneurysm and the definition of this rupture as the main mitral regurgitation mechanism were achieved by TEE. TEE also proved valuable in the careful evaluation of the mitral valve and selection of mitral valve replacement over repair as the surgical strategy.

Supplementary data

Supplementary data are available at European Journal of Echocardiography online.

Conflict of interest: none declared.

References