

The role of real-time 3-dimensional transesophageal echocardiography in depiction of the concealed base of the iceberg

Gerçek zamanlı 3 boyutlu transözafajiyal ekokardiyografinin, buzdağının bilinmeyen yüzünü ortaya çıkarmadaki rolü

A 57-year-old woman who had underwent mechanical mitral valve replacement 10 years ago was admitted to our clinic with a recent history of recurrent transient ischemic attacks and an international normalized ratio (INR) of 2.2. Electrocardiogram revealed normal sinus rhythm. Transthoracic echocardiography showed normally functioning mitral prosthesis with normal transmitral gradients (maximum: 5 mmHg, mean: 2 mmHg) with a valve area of 2.6 cm² (Fig. 1). Two-dimensional transesophageal echocardiography (2D TEE) delineated small thrombi on the hinges (Fig. 2 and 3). Subsequent real-time 3-dimensional transesophageal echocardiographic (RT-3D TEE) examination depicted crown-like thrombus located almost on the entire valve ring (Fig. 4, schematic Fig. 5 and Video 1-See corresponding video/movie images at www.anakarder.com). The patient was anticoagulated with a target INR of 3.5-4 without suffering any thromboembolism for the 1 year of follow-up.

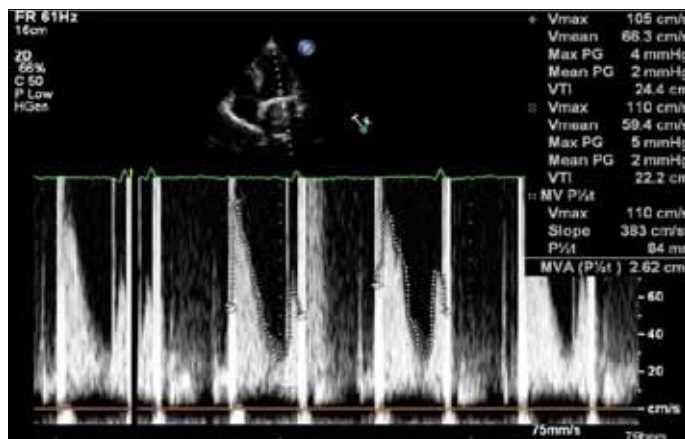


Figure 1. Transthoracic Doppler echocardiography shows normally functioning mitral prosthesis



Figure 2. Two-dimensional transesophageal echocardiography delineates prosthetic valve thrombosis located on the hinges; arrow indicates the thrombi

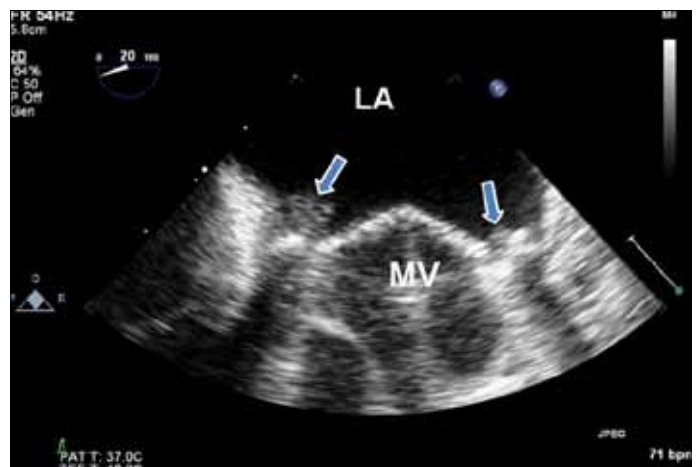


Figure 3. Two-dimensional transesophageal echocardiography delineates prosthetic valve thrombosis located on the hinges; arrows indicate the thrombi



Figure 4. Real-time 3-dimensional transesophageal echocardiography delineates ring-located prosthetic valve thrombosis; arrows indicate the thrombi

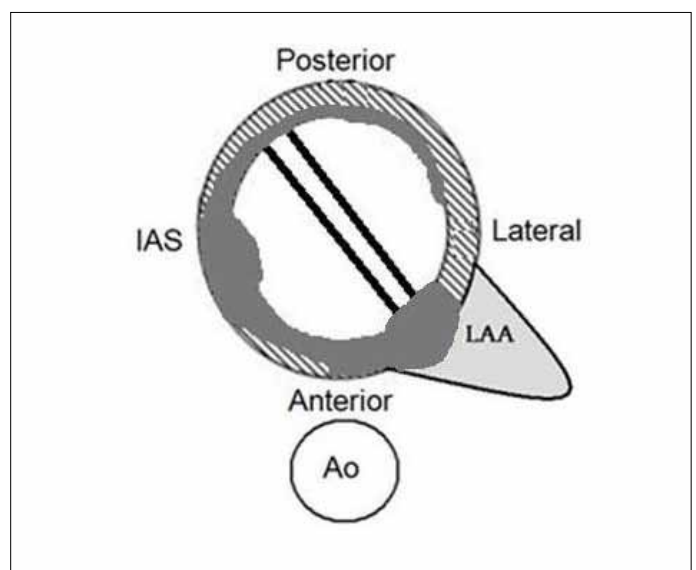


Figure 5. Schematic figure shows the crown-like ring-located prosthetic valve thrombus and the relationship between cardiac structures

RT-3D TEE provides a more comprehensive delineation of prosthetic valve thrombosis with 'en face' images compared to conventional 2D TEE which may underestimate or even miss thrombi, particularly when it is ring-located and non obstructive- 'Doppler silent'. RT-3D TEE may inform the clinician about the total thrombus burden in detail helping to organize a more strict anticoagulation therapy.

Video 1. Real-time 3-dimensional transesophageal echocardiography delineates crown-like and ring-located prosthetic valve thrombosis.

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A parachute mitral valve accompanying persistent left superior vena cava: assessment by three-dimensional transthoracic echocardiography

Üç boyutlu transtorasik ekokardiyografi ile değerlendirilen persistan sol superior vena kavanın eşlik ettiği paraşüt mitral kapak

A 25-year-old-male patient applied to our outpatient clinic with palpitation and shortness of breath. His medical and family history was unremarkable. The 12-lead electrocardiogram showed a sinus rhythm. Two-dimensional transthoracic echocardiography revealed dilated coronary sinus (CS) and parachute mitral valve (PMV). The max/mean pressure gradient across the mitral valve was 9/5 mmHg (Fig. 1 A). Because of the enlarged CS, we injected agitated saline into left ante-cubital vein to determine whether there was an associated persistent left superior vena cava (PLSVC). Injection resulted in opacification of the dilated coronary sinus and subsequently the right atrium (Fig. 1B). For further evaluation of this pathology, we applied three-dimensional transthoracic echocardiography (3D TTE), which revealed morphological features of this pathology in detail (Fig 1C-1F and Video C, D, E and F-See corresponding video/movie images at www.anakarder.com). Characteristic findings of PMV are the presence of solitary papillary muscle (Fig. 1C, 1E and Video C, E-See corresponding video/movie images at [\) and pear-like shape of left atrium \(Fig. 1C-1E and Video C, D, E-See corresponding video/movie images at](http://www.anakarder.com), funnel shape of mitral valve (Fig. 1F and Video F), doming shape of elongated chordae tendinea (Fig. 1C, 1E and Video C, E-See corresponding video/movie images at <a href=)

Figure 1. Transthoracic echocardiography revealing 9/5 mmHg pressure gradient across the mitral valve (A), agitated saline injection resulting in opacification of the dilated coronary sinus and subsequently the right atrium (B), three-dimensional transthoracic echocardiography (3D TTE) revealing characteristic findings of PMV including solitary papillary muscle (Figure and Video C, E), funnel shape of mitral valve (Figure and Video F), doming shape of elongated chordae tendinea (Figure and Video C, E) and pear-like shape of left atrium (Figure and Video C, D, E)
CS - coronary sinus, LA - left atrium, PMV - parachute mitral valve, RA - right atrium

PMV is commonly associated with other cardiac abnormalities. Adult patients with PMV are usually asymptomatic and most often diagnosed incidentally echocardiography done for another reason. Although, echocardiography is main diagnostic tool in majority of cases, identification of all PMV characteristics sometimes needs complementary imaging modalities. We used 3D- echocardiography in our case that provided invaluable information about PMV in TTE images.

Video 1. Transthoracic echocardiography revealing 9/5 mmHg pressure gradient across the mitral valve (A), agitated saline injection resulting in opacification of the dilated coronary sinus and subsequently the right atrium (B), three-dimensional transthoracic echocardiography (3D TTE) revealing characteristic findings of PMV including solitary papillary muscle (Figure and Video C, E), funnel shape of mitral valve (Figure and Video F), doming shape of elongated chordae tendinea (Figure and Video C, E) and pear-like shape of left atrium (Figure and Video C, D, E).

CS - coronary sinus, LA - left atrium, PMV - parachute mitral valve, RA - right atrium

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