



## Intense Microbubbles Mimicking Mobile Thrombus in a Patient with Prosthetic Mitral Valve

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### ABSTRACT

Microbubbles have been presumed as gaseous emboli, which originate during mechanical heart valve closure, but are not seen in bioprosthetic valves. In this report, we presented a cluster of microbubbles mimicking mobile thrombus in a patient with mechanical mitral valve prosthesis. A 30-year-old female with a history of implanted mechanical valve at the mitral position underwent a routine examination. She was asymptomatic and her physical examination was unremarkable. Transthoracic echocardiography showed a mobile thrombus-like mass on the ventricular side of the prosthetic mitral valve moving into the left ventricular outflow tract. However, close examination of images indicated that the mass was in fact intense microbubbles mimicking thrombus. Intense mobile microbubbles can be misdiagnosed as a mobile thrombus. We recommend and underscore the importance of detailed echocardiographic examination in case of mobile mass to avoid misdiagnosis in patients with mechanical heart valves.

### 1. Introduction

Microbubbles have been presumed as gaseous emboli, which originate during mechanical heart valve closure, but are not seen in bioprosthetic valves. This phenomenon often appears as high, bright, highly reflective, mobile echoes detected by echocardiography (1, 2). There are very rare reports in the literature about cluster of microbubbles seen and mistakenly interpreted as a mass on echocardiography. In this report, we present a cluster of microbubbles mimicking mobile thrombus in a patient with mechanical mitral valve prosthesis.

### 2. Case Presentation

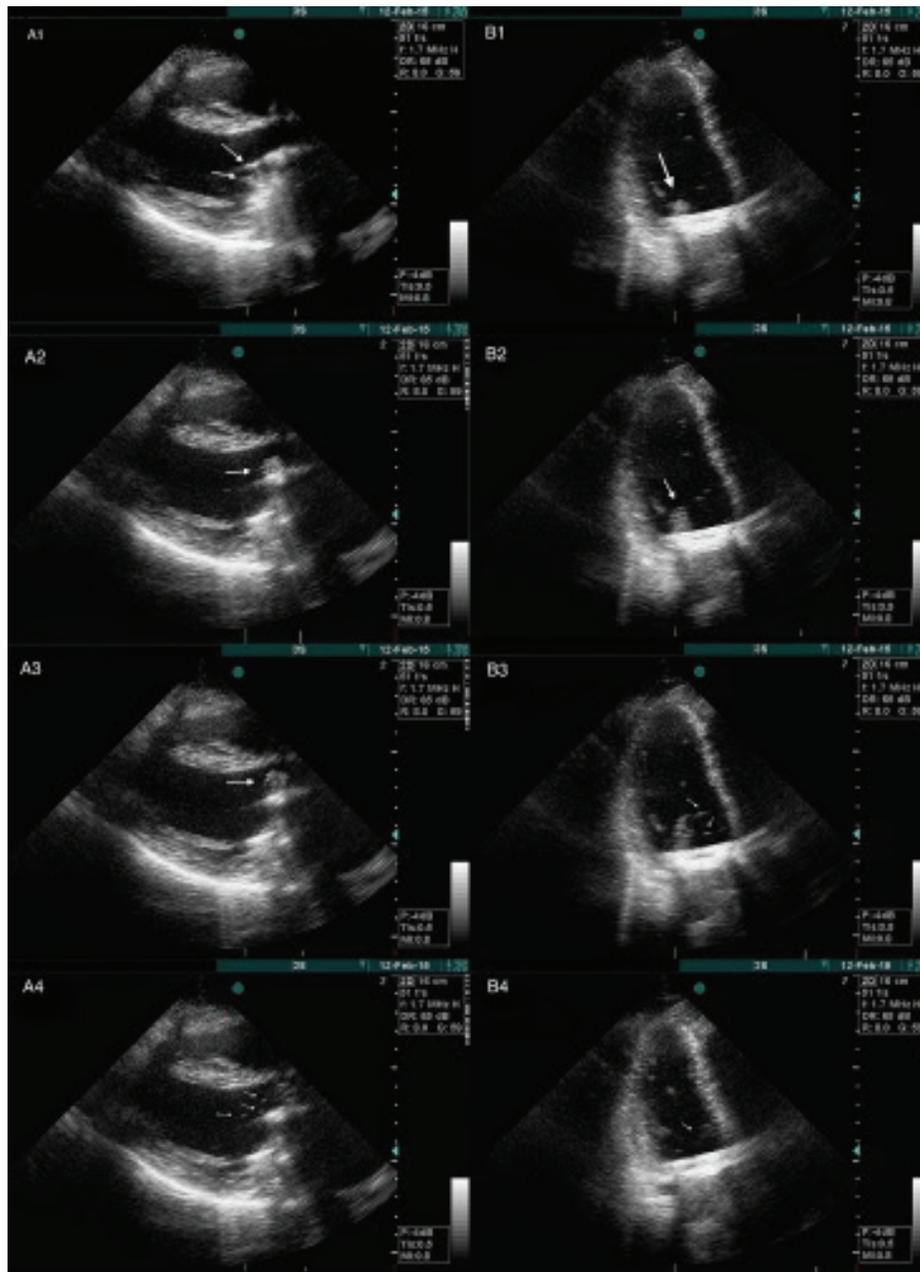
A 30-year-old female admitted to our outpatient clinic for a routine examination. She was operated for mitral valve replacement in 2013. The mechanical mitral valve was Carbomedics bileaflet prosthesis (size: 27 mm). She was asymptomatic and her physical examination was unremarkable. Transthoracic echocardiography was performed, which revealed that the mean gradient and valve area were within normal limits. However,

a 1.4 × 1.2 cm mobile mass mimicking thrombus was observed on the ventricular side of the prosthetic mitral valve moving into the left ventricular outflow tract (Videos 1 and 2). Infective endocarditis was ruled out by means of laboratory examination. International Normalised Ratio (INR) was in the therapeutic range. Transesophageal echocardiography was also performed for detailed examination of the mass and revealed no signs of thrombus neither in the mitral valve position nor in the left ventricular outflow tract (Video 3). At the first glance, the mass was interpreted as a mobile thrombus. However, close examination with slow motion of images showed a cluster of microbubbles that quickly scattered with bright echoes and disappeared soon. This indicated that the mass was in fact intense microbubbles mimicking thrombus (Figure 1). [To watch the videos, please refer to html format.]

### 3. Discussion

Microbubbles are well known but poorly understood phenomena occurring mostly in patients with prosthetic mitral heart valves. Generally, two processes have been suggested to produce microbubbles. The first one is degassing referring to extraction of dissolved gas from

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**Figure 1.** Parasternal Long Axis Views of the Mobile Mass Mimicking Thrombus, Which Soon Scattered with Multiple Bright Echoes (Microbubbles); (Arrows) (A1-4). Apical four-chamber views of intense microbubbles mimicking thrombus. Note the disappearance of scattering microbubbles (arrows) (B1-4)

blood during valve closure. In addition, the second one is vortex cavitation that results from vaporization of blood by rapid pressure drops at the site of valve closure (3). It has also been suggested that the presence of microbubbles may be related to certain types of valves, particularly Carbomedics valves (4, 5). In our case, the type of valve was Carbomedics, too.

The clinical significance of microbubbles associated with prosthetic heart valves has been speculated in some studies. Microbubbles detected by transcranial Doppler ultrasound in the cerebral circulation have been shown to be related to some degrees of neurological disorders (6, 7). It is also clinically important to be aware of the intense microbubbles that can cause impression of a thrombus-like mass and lead to incorrect treatment. Very similar case reports to ours showed that cluster of microbubbles

might be mistakenly interpreted as a cardiac mass. In an image report, a hypermobile, quickly disappearing mass between mechanical mitral valve and mechanical aortic valve position was diagnosed as a cluster of microbubbles after a careful echocardiographic evaluation (8). The results of a case report also showed that a mass at the aortic mechanical valve position following the movement of the mechanical heart valve was suspected as a vegetation-like structure, which eventually proved to be a product of degassing microbubbles. Similarly, in our case, a mobile mass mimicking thrombus was detected on the ventricular side of the prosthetic mitral valve in transthoracic echocardiography. However, it was not produced during transesophageal echocardiography, which can be explained by less visualization of microbubbles at higher ultrasound frequencies used (9).

### 3.1. Conclusion

Intense mobile microbubbles can be misdiagnosed as a mobile thrombus. We recommend and underscore the importance of detailed echocardiographic examination in case of mobile mass to avoid misdiagnosis in patients with mechanical heart valves.

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### Authors' Contribution

Fatma Yılmaz Coşkun: Wrote the case report, Gökhan Altunbaş: Performed echocardiography of the case, Orhan Ozer: Supervised the case report

### Financial disclosure

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