

Visualization of Ruptured Aneurysm of Anterior Mitral Leaflet by Three-Dimensional Transesophageal Echocardiography

A 37-year-old man was admitted to our institution with cough and chest tightness for 1 month. He had no history of chills or fever. On admission, his temperature was normal. The level of C-reactive protein was significantly increased to 91.5 mg/L, and the white cell count was within the normal range. The results of blood cultures of anaerobic bacteria, aerobic bacteria, and fungi were negative. Transthoracic echocardiogram showed rheumatic changes of the mitral and aortic valves, with severe mitral stenosis and moderate mitral regurgitation, moderate aortic stenosis, and moderate to severe aortic regurgitation. A circular echo-lucent structure (1.1 × 0.8 cm) attaching to the anterior mitral leaflet (AML) and bulging into the left atrium was visualized (Figure 1A). A rupture (0.27 cm) could be seen on the aneurysmal wall (Figure 1B). Additionally, vegetation (1.0 × 0.8 cm) attached to aortic valve right coronary cusp was also identified (Figure 2). Transthoracic echocardiogram showed dilated left atrium and left ventricle with normal left ventricular systolic function. Transesophageal echocardiography (TEE) confirmed the presence of a ruptured aneurysm of AML (Figure 3A and 3B, Video 1). Conventional 3-dimensional (3D) transesophageal echocardiography demonstrated a ruptured aneurysm protruding from scallop A2 of the AML (Figure 4, Video 2). TrueVue 3D-TEE clearly displayed the subtle structure of aneurysm of AML, allowing the echocardiographic

E-PAGE ORIGINAL IMAGE

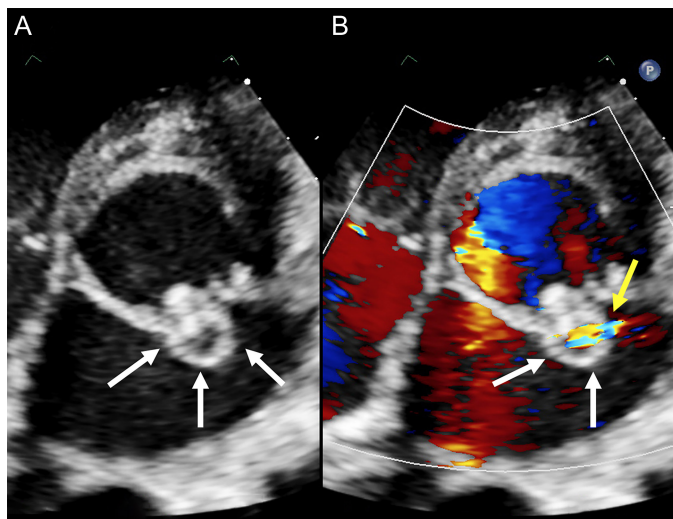


Figure 1. (A) Transthoracic echocardiogram modified short-axis view at the level of mitral anterior leaflet showing an aneurysm of middle scallop. (B) Transthoracic echocardiogram modified short-axis view at the level of mitral anterior leaflet with color Doppler showing abnormal flow through a ruptured aneurysmal segment. White arrows indicating aneurysm of anterior mitral leaflet; yellow arrows indicating a hole on the aneurysmal wall.

Mengmeng Ji ^{1,2,3,#}

Lingyun Fang ^{1,2,3,#}

Mingxing Xie ^{1,2,3,#}

Yuman Li ^{1,2,3}

¹Department of Ultrasound Medicine, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

²Clinical Research Center for Medical Imaging in Hubei Province, Wuhan, China

³Hubei Province Key Laboratory of Molecular Imaging, Wuhan, China

Corresponding author:

Yuman Li

✉ liym@hust.edu.cn

Cite this article as: Ji M, Fang L, Xie M, Li Y. Visualization of ruptured aneurysm of anterior mitral leaflet by three-dimensional transesophageal echocardiography. *Anatol J Cardiol.* 2022;26(12):E-20-E-22.

#These authors contributed equally.



Copyright@Author(s) - Available online at anatoljcardiol.com.
Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

DOI:10.5152/AnatolJCardiol.2022.2059

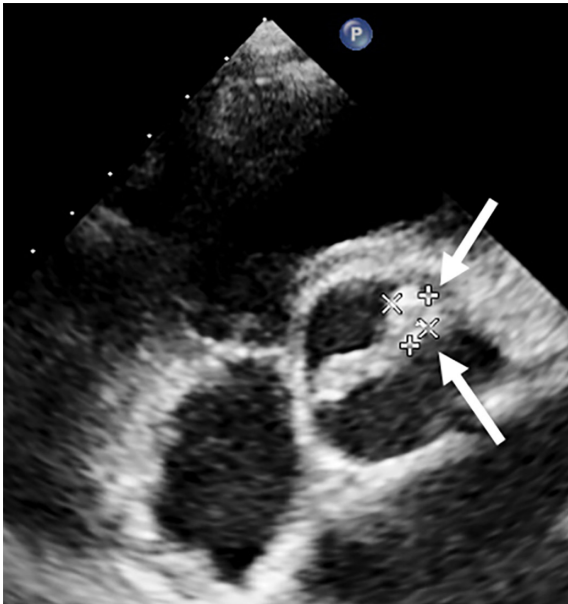


Figure 2. Transthoracic echocardiogram short axis view at the level of aortic valve showing a mass accepted as a vegetation attached to the aortic valve right coronary cusp. White arrows indicating the vegetation attached to the aortic valve right coronary cusp.

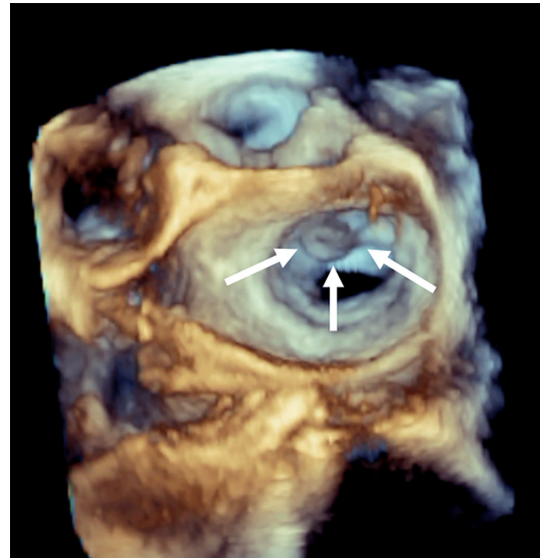


Figure 4. Three-dimensional transesophageal echocardiography mitral examination showing an aneurysm of anterior mitral valve middle scallop. White arrows indicating aneurysm of anterior mitral leaflet.

images to more closely resemble the real anatomical pathology. (Figure 5A and 5B, Videos 3-5). He underwent mitral and aortic valve replacement. Postoperatively, a ruptured aneurysm was found at the AML (Figure 6A and 6B). In addition, the presence of right coronary cusp vegetation was also confirmed. Post-bypass TEE demonstrated well-functioning prosthetic mitral and aortic valves. The patient was doing well postoperatively. In our case, mitral valve aneurysm was best visualized by 3D-TEE, and infective endocarditis was

the cause of it. The present case highlights that 3D-TEE plays a vital role in characterizing the mitral valve pathologies and determining the surgical plan.

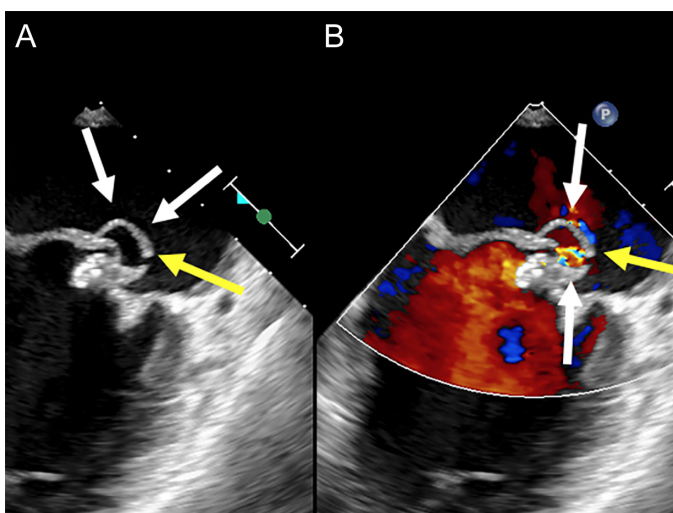


Figure 3. (A, B) Transesophageal echocardiography middle esophageal bicommissural view showing an aneurysm and rupture of anterior mitral valve middle scallop. White arrows indicating aneurysm of anterior mitral leaflet; yellow arrows indicating a hole on the aneurysmal wall.

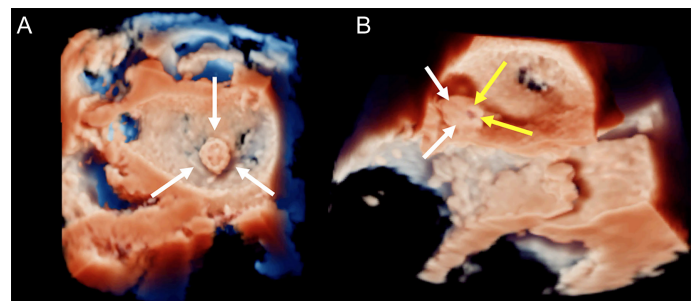


Figure 5. TrueVue 3-dimensional transesophageal echocardiography displaying aneurysm of anterior mitral leaflet (A) and its ruptured site as a hole (B). White arrows indicating aneurysm of anterior mitral leaflet; yellow arrows indicating a hole on the aneurysmal wall.

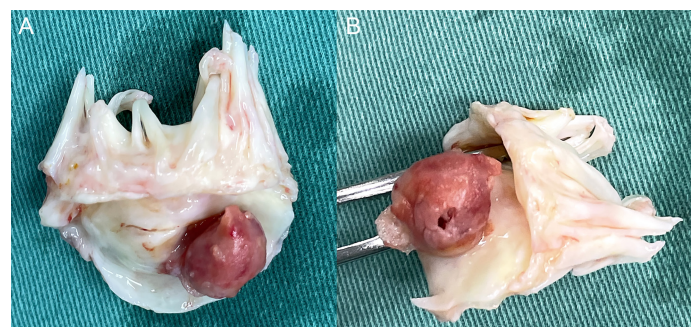


Figure 6. Postoperative specimens. (A, B) Postoperative photographs demonstrating a ruptured aneurysm.

Informed Consent: Informed consent was obtained from the patient for this study.

Funding: This work was supported by National Natural Science Foundation of China (grant no. 81727805) and the Key Research and Development Program of Hubei (grant nos. 2020DCD015, 2021BCA138).

Video 1: Transesophageal echocardiography demonstrating a ruptured aneurysm of anterior mitral leaflet.

Video 2: Conventional 3-dimensional transesophageal echocardiography disclosing a ruptured aneurysm protruding from scallop A2 of the anterior mitral leaflet.

Video 3: TrueVue 3-dimensional transesophageal echocardiography displaying the structure of aneurysm of anterior mitral leaflet.

Video 4: TrueVue 3-dimensional transesophageal echocardiography displaying the structure of aneurysm of anterior mitral leaflet.

Video 5: TrueVue 3-dimensional transesophageal echocardiography displaying the structure of aneurysm of anterior mitral leaflet.