

## IMAGING VIGNETTE

INTERMEDIATE

## CLINICAL VIGNETTE

# Successful Percutaneous Edge-to-Edge Mitral Valve Repair in a Patient With Mediastinal Shift



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## ABSTRACT

Mediastinal shift often induces deformation of the esophagus and the cardiac chamber. We describe the case of percutaneous mitral edge-to-edge valve repair in a patient with mediastinal shift. Esophagography enabled the advancement of the transesophageal echocardiography probe without esophageal damage, and transesophageal echocardiography successfully guided the percutaneous mitral edge-to-edge valve repair procedure. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2020;2:2138–40) © 2020 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

An 85-year-old man with a history of pulmonary tuberculosis was referred to our institution with congestive heart failure caused by severe mitral regurgitation (MR). Chest radiography and computed tomography showed collapsed right lung with mediastinal shift, resulting in tortuous esophagus and horseshoe-shaped left atrium (LA) (**Figures 1A and 1B**). He was frail and had reduced pulmonary function; therefore, our heart team decided to perform percutaneous mitral edge-to-edge valve repair (PMVR) using the MitraClip system (Abbott Vascular, Lake Bluff, Illinois).

Esophagography with bolus injections of diatrizoate meglumine and diatrizoate sodium solution via nasoesophageal tube was used to guide the transesophageal echocardiography (TEE) probe to advance across the esophageal curvature in front of the thoracic spine (**Figure 1C, Video 1**). Under TEE guidance, we manipulated the clip delivery system into the narrow LA lumen without any injury of LA (**Figure 1D**) and successfully implanted 2 clips at the center of the A2-P2 portion. Post-procedural TEE showed marked reduction of MR from severe to mild (**Figures 1E and 1F, Videos 2 and 3**).

The mediastinal shift toward the affected side is not a rare condition among elderly patients with a history of pulmonary tuberculosis or pneumonectomy (1). In particular, right-sided mediastinal shift is likely to induce deformation of the esophagus and the cardiac chamber (2). TEE is an essential tool for PMVR that enables 3-

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC: Case Reports* [author instructions page](#).

Manuscript received April 26, 2020; revised manuscript received June 3, 2020, accepted June 17, 2020.

dimensional visualization of the mitral complex including the LA with its higher spatial and temporal resolution than intracardiac echocardiography. In our case, esophagography enabled the advancement of the TEE probe without esophageal damage, and TEE successfully guided the PMVR procedure in a patient with mediastinal shift.

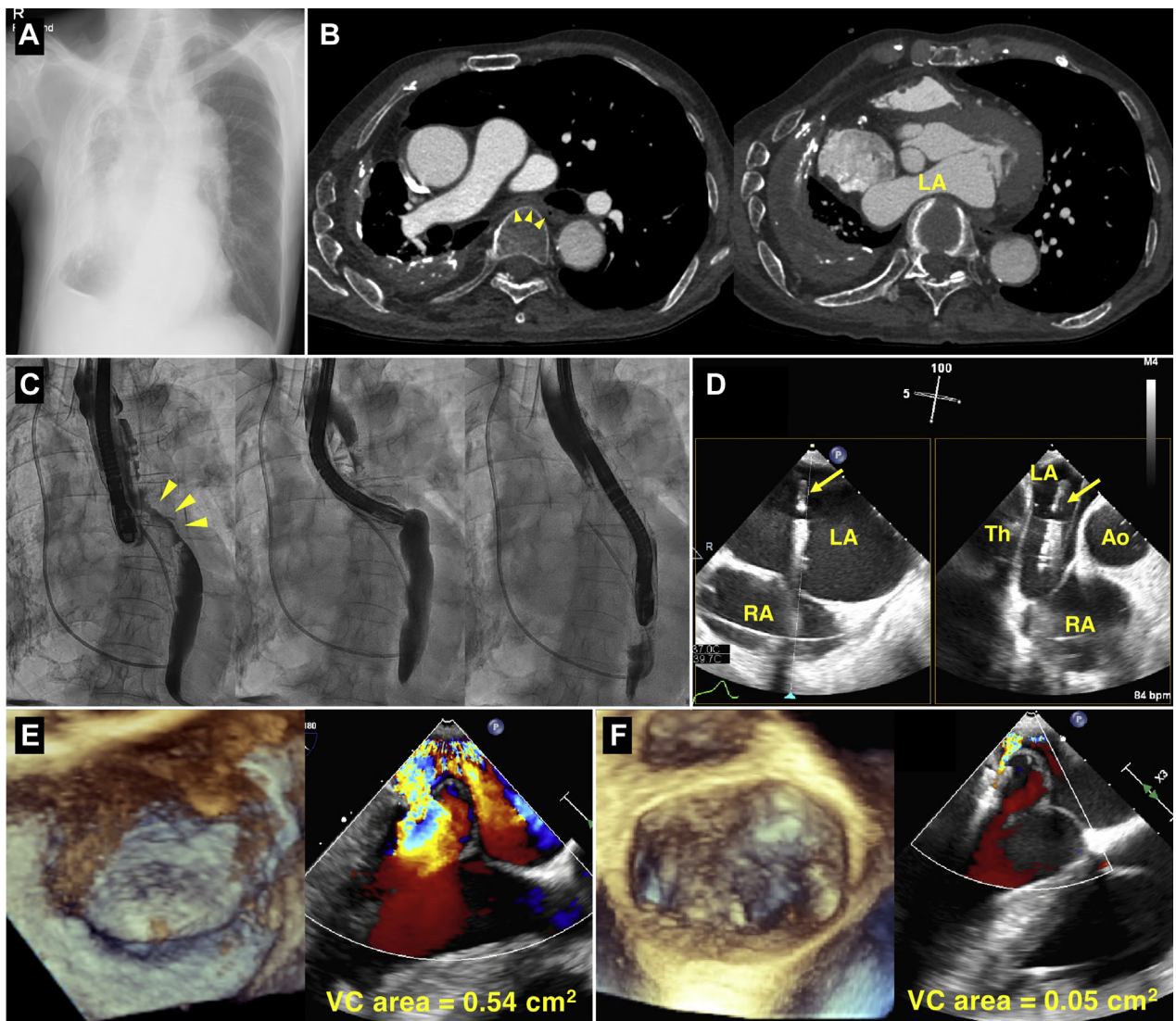
#### AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

#### ABBREVIATIONS AND ACRONYMS

**LA** = left atrium  
**MR** = mitral regurgitation  
**PMVR** = percutaneous mitral edge-to-edge valve repair  
**TEE** = transesophageal echocardiography

**FIGURE 1** Successful Percutaneous Edge-to-Edge Mitral Valve Repair Using MitraClip System for a Patient With Right-Sided Shift of Mediastinum



**(A)** Chest radiography showing collapsed right lung with mediastinal shift. **(B)** Pre-procedural computed tomography showing curved esophagus (arrowheads) and horseshoe-shaped left atrium (LA) compressed by the thoracic vertebrae (Th). **(C)** Intraoperative esophagography showing the esophageal curvature (arrowheads). Esophagography guidance enabled the advancement of the transesophageal echocardiography (TEE) probe across the curvature (Video 1). **(D)** Simultaneous biplane TEE guidance enabled manipulation of the clip delivery system (arrow) without injury of the narrow LA. **(E)** Pre-procedural TEE showing severe mitral regurgitation caused by wide prolapse of the A2 segment (frail width 23 mm, frail gap 7 mm, vena contracta [VC] area 0.54 cm<sup>2</sup>) (Video 2). **(F)** TEE following the deployment of 2 clips at the center of the A2-P2 portion, demonstrating reduction of mitral regurgitation from severe to mild (VC area 0.05 cm<sup>2</sup>) (Video 3). Ao = aorta; RA = right atrium.

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**KEY WORDS** mediastinal shift, obsolete pulmonary tuberculosis, percutaneous mitral valve repair

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 **APPENDIX** For supplemental videos, please see the online version of this paper.