

**Title:**

Severe Secondary Mitral Regurgitation from Atypical True Left Ventricular Aneurysm: A Multimodality Cardiac Imaging Diagnosis

**Authors:**

Perry Wengrofsky, MD (1); Saahil Jumkhawala, MD (2); Amanda Meredith, MD (2); Julius M. Gardin, MD, MBA, FACC, FASE (1); Christine Gerula, MD (1); Alfonso Waller, MD, FACC, FASE, FASNC, FSCCT, RPVI (1)

**Background:**

Mitral regurgitation (MR) is classified as primary MR, stemming from abnormalities of the mitral leaflets, subvalvular apparatus, or chordae and papillary muscles, or secondary MR, arising from left atrial or ventricular (LV) structural abnormalities and resulting annulus dilation and incomplete leaflet coaptation (1). True LV aneurysms, common in antero-apical myocardial infarction, are outpouchings of scarred myocardium that can cause mechanical complications depending on size and location. We present the case of a patient with an atypically located posterior true LV aneurysm causing mitral annular dilation and secondary MR.

**Clinical Case:**

A 54-year-old female with past medical history of hypertension and ischemic stroke presented with palpitations. She was hypotensive and tachycardia in rapid atrial flutter (figure 1), and subsequently cardioverted to sinus rhythm. Transthoracic echocardiography (figure 2) showed severe MR, posterior papillary muscle dysfunction, and basal inferior akinesis and mid inferior hypokinesis. Given recurrent unstable atrial flutter, the MR was further evaluated with transesophageal echocardiography (figure 3), which demonstrated posteriorly directed MR and outpouching of the inferior wall. Coronary angiography (figures 4) showed 100% chronic total occlusion of the mid right coronary artery (RCA). Cardiac magnetic resonance imaging (figures 5) revealed a true posterior LV aneurysm of the basal and mid inferior wall in the distribution of distal RCA. She underwent mitral valve replacement.

**Conclusion:**

True LV aneurysms are uncommon causes of secondary MR, and should be suspected when outpouching is identified on echocardiography. Further evaluation with multimodality diagnostic imaging, including cardiac magnetic resonance imaging, should be performed to assess for location and physiologic implications.

**References:**

1. Chehab O, Roberts-Thomson R, Ng Yin Ling C, et al. Secondary Mitral Regurgitation: Pathophysiology, Proportionality and Prognosis. *Heart*. 2020; 106(10): 716-723.
2. Sharma A, Kumar S. Overview of Left Ventricular Outpouching on Cardiac Magnetic Resonance Imaging. *Cardiovasc Diagn Ther*. 2015; 5(6): 464-470.