

Ventricular Septal Defect Complicating an Acute Myocardial Infarction

Mazullah Kamran, MD; Mehran Attari, MD; Geoffrey Webber, MD

A 66-year-old woman with no known medical history presented to the emergency department complaining of chest discomfort and difficulty breathing for the last 24 hours. She was in respiratory distress with a heart rate of 105 bpm and blood pressure of 115/65 mm Hg. The jugular venous pressure was elevated and there was a 4/6 holosystolic murmur across the precordium with a thrill. The ECG (Figure 1) showed acute anterior and inferior ST-segment elevation myocardial infarction (MI). The first total CK-MB fraction and troponin-I levels were 2001 U/L, 25.43 U/L, and 35 ng/mL, respectively. Coronary angiography (Figure 2) revealed total occlusion of mid-left anterior descending (LAD) artery. Left ventriculography (Figure 3) showed immediate opacification of the right ventricle (RV) after the left ventricle (LV) and subsequently the main pulmonary artery (MPA) and its left and right branches (RPA and LPA), right atrium (RA), and inferior vena cava (IVC). The oxygen saturation of the RA, RV, MPA, and aorta were 80%, 96%, 96%, and 96%, respectively, which is compatible with a large ventricular septal defect (VSD). Transthoracic echocardiography demonstrated a large tear in the apical segment of the ventricular septum with a maximal systolic gradient of 45 mm Hg (Figure 4).

This case highlights many classic features of ventricular septal rupture complicating myocardial infarction seen during the prethrombolytic era. Risk factors for VSD include age >60 years, female sex, no history of previous MI, hypertension, and late presentation after onset of symptoms. Anatomically, this type of VSD is more common with large anterior infarcts in the absence of collateral blood flow. The presence of anterior and inferior ST elevation suggests a large wrap around LAD supplying the anterior and inferior apical septum where the ventricular septal tear occurred. In patients presenting with cardiogenic shock and MI, the physical examination is an essential part of the evaluation and diagnosis of a ventricular septal rupture. Confirmation of a VSD can be made on right heart catheterization by an increase in oxygen saturation from the RA to the RV, or as in this case, a dramatic filling of contrast in the right side of the heart and pulmonary artery with ventriculography in the left side of the heart. The patient was stabilized with intraaortic balloon pump and underwent successful VSD repair. She was discharged on postoperative day 15. At 3 months, the patient was seen in the outpatient clinic without significant complaints.

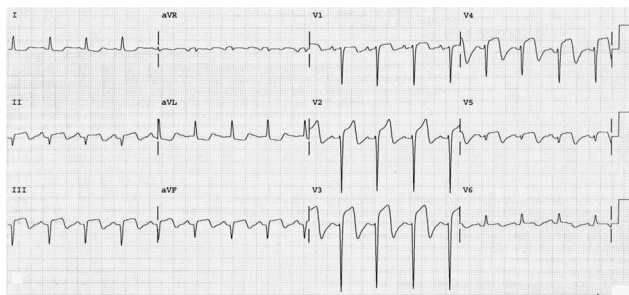


Figure 1. ECG shows acute anterior and inferior wall ST elevation.

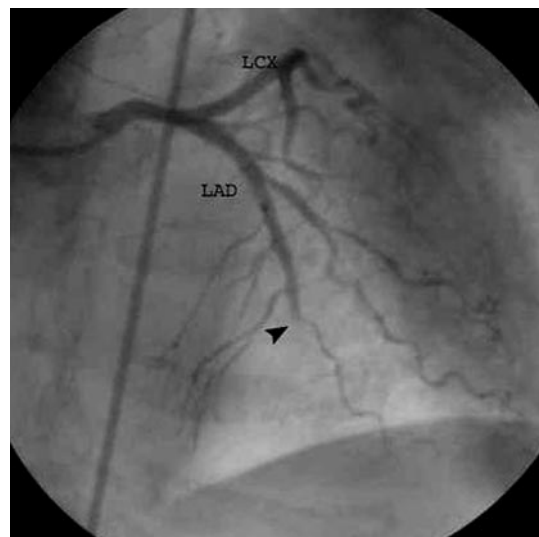


Figure 2. Coronary angiogram demonstrates total occlusion of mid-LAD coronary artery (arrowhead). CFX indicates left circumflex coronary artery.

From the Mount Sinai School of Medicine, New York, NY.

Correspondence to Dr Mazullah Kamran, The Zena and Michael A. Wiener Cardiovascular Institute, Mount Sinai Medical Center, Box 1030, One Gustave L. Levy Pl, New York, NY 10029. E-mail Mazullah.Kamran@msnyuhealth.org
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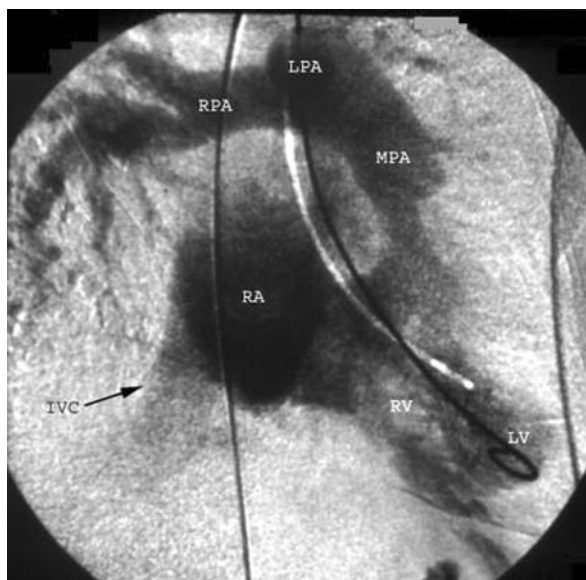


Figure 3. Left ventriculography shows immediate opacification of LV and then RV with subsequent filling of MPA, its RPA and LPA, RA, and IVC.

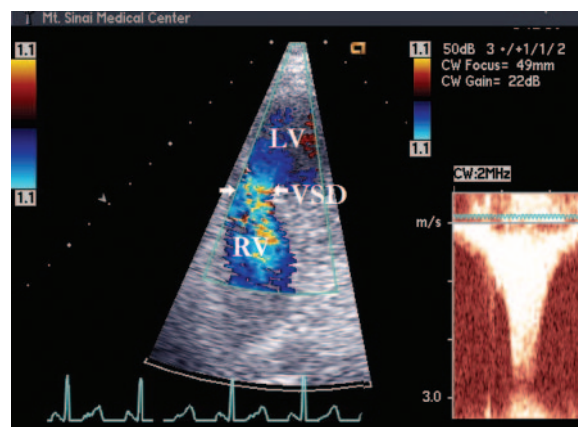


Figure 4. Two-dimensional echocardiography. Closeup of ventricular septum in apical 4-chamber view (left) demonstrates turbulent systolic color flow Doppler across large VSD. Continuous wave Doppler (right) demonstrates systolic flow across VSD.

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