

Ventricular Septal Rupture in the Cardiac Catheterization Laboratory

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INTRODUCTION

- Ventricular septal rupture is a rare but deadly complication of acute myocardial infarction (AMI)
- We describe a case that was recognized at time of occurrence in the cardiac catheterization lab

CASE PRESENTATION

75 year old female with hypertension (HTN):

- Three days substernal chest pain, to left arm, associated dyspnea, nausea, vomiting, unrelieved by simethicone or position change
- BP 165/92, HR 104, normal cardiovascular and pulmonary exam, without jugular venous distension, rales, murmurs or gallops
- Electrocardiogram (ECG) depicted below
- Echocardiogram: inferior & inferoseptal akinesis, ejection fraction 30%

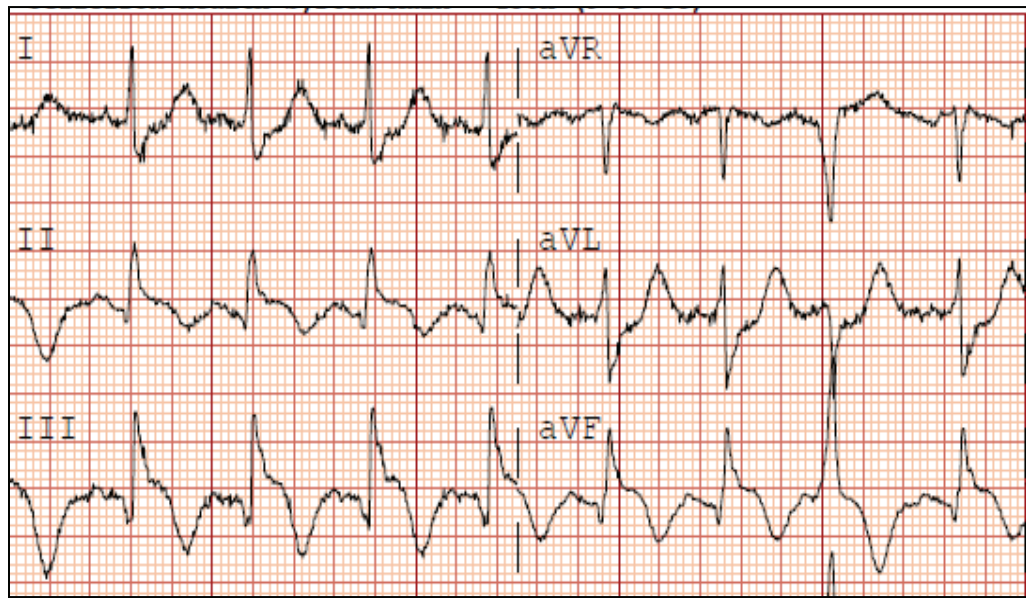


Figure 1. Limb leads of Initial ECG revealing inferior acute injury pattern, indicative of acute right coronary artery occlusion

HOSPITAL COURSE

- Aspirin 325mg, heparin & eptifibatide infusions
- Taken urgently to cardiac catheterization
- BP to 182/107 → low dose nitroglycerin infusion
- Acutely developed profound hypotension
- Nitroglycerin discontinued
- Intra-aortic balloon pump placed

- Coronary angiography showed multi-vessel disease.
- The blockage in the right coronary artery (RCA) was intervened upon with plain old balloon angioplasty (POBA)

Coronary vasculature	Stenosis
Distal left main	60%
Proximal LAD	50%
Mid LAD	90%
Proximal circumflex	50%
Distal RCA	100%

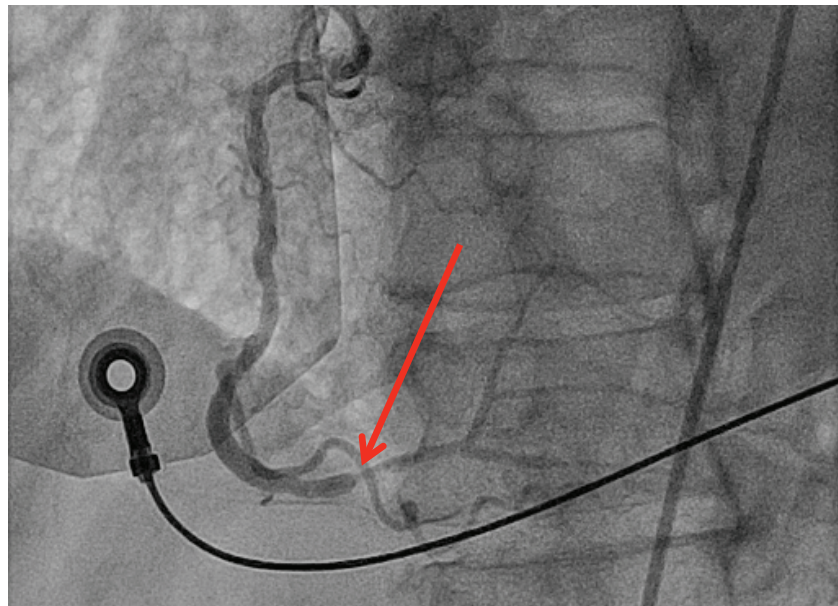
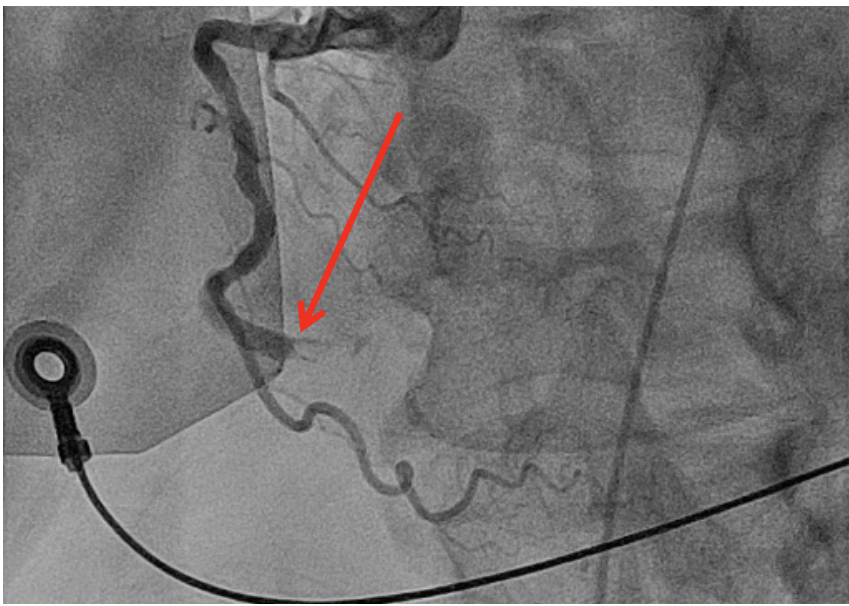


Figure 2. Left: Total occlusion (arrow) of distal RCA; Right: Improvement in RCA flow (arrow) following POBA

- Due to new, acute hypotension in the lab, left ventriculography (LVG) was performed and showed inferoseptal ventricular septal rupture
- Repeat physical exam revealed a new 4/6 holosystolic murmur and thrill
- Repeat echocardiogram confirmed the new inferoseptal ventricular septal rupture with extension into the inferior wall, not present on echocardiogram before cardiac catheterization
- The patient underwent emergent patch repair of ventricular septal rupture and coronary artery bypass grafting (CABG) of left anterior descending artery (LAD)

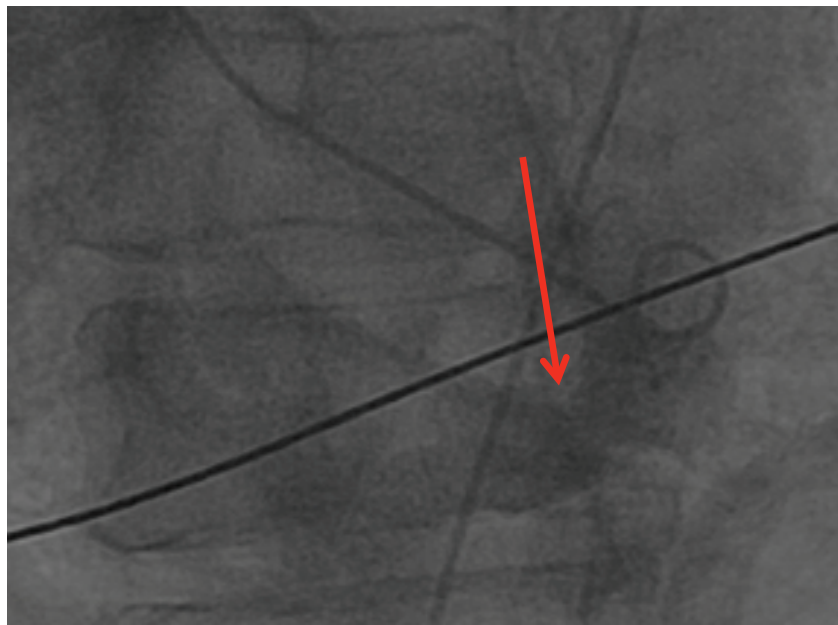
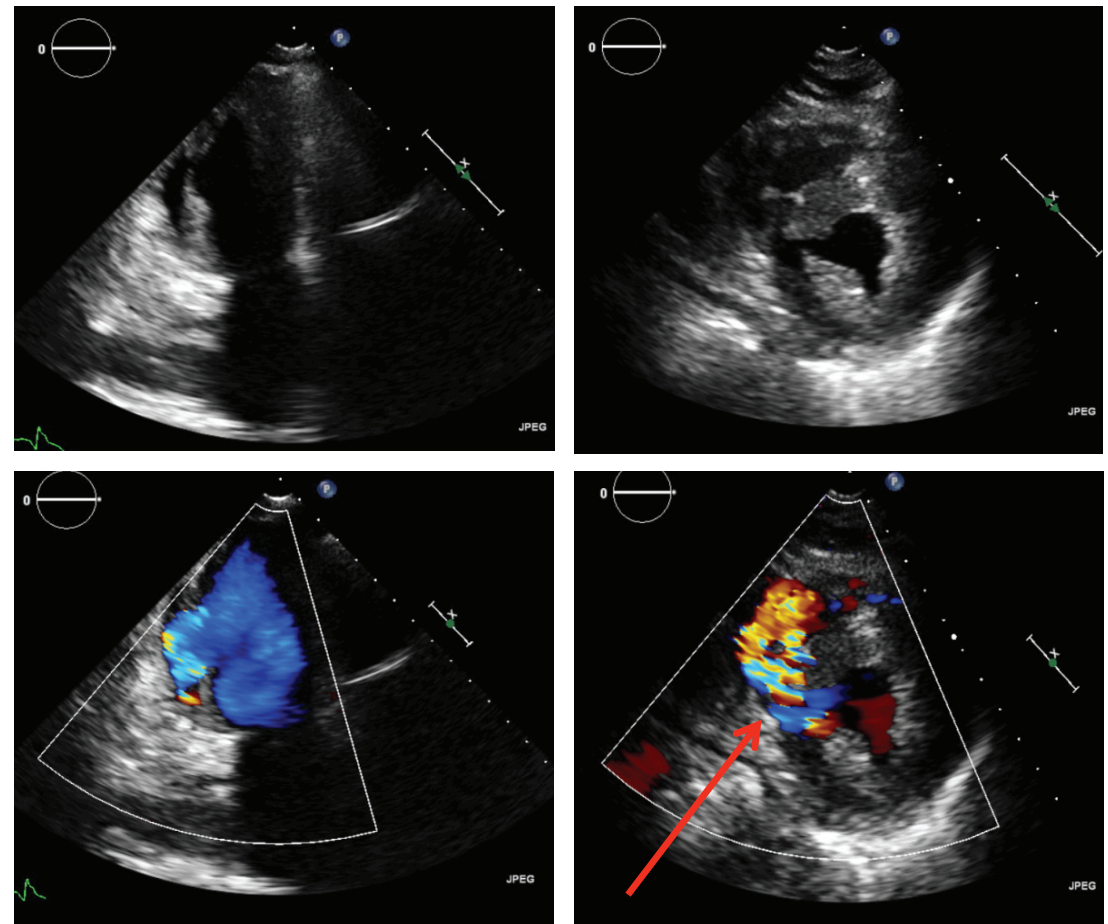


Figure 3. Contrast LVG with pigtail catheter shows left to right flow through an inferoseptal ventricular septal rupture (arrow)

Figure 4. Echocardiogram: Left: Two chamber view without (top) and with (bottom) color flow Doppler demonstrating inferior wall myocardial partial thickness tear Right: Short axis view without (top) and with (bottom) color flow Doppler showing inferoseptal ventricular septal rupture with left to right flow (arrow)



DISCUSSION

- Ventricular septal rupture complicating AMI has a bimodal peak: 24 hr & 3-5 d; incidence of 0.25%
- Risk factors: age >60 years, female sex, no previous MI, HTN, late presentation, LAD disease
- Diagnosis: Classically by pulmonary artery catheterization with step-up in oxygen saturation from right atrium to ventricle, often with prominent V waves on wedge pressure. Echocardiography with color Doppler is now considered diagnostic
- Uniformly fatal when presenting as cardiogenic shock. Urgent surgical repair is indicated, with best results occurring simultaneously with CABG
- If more stable, and/or surgery contraindicated, percutaneous closure techniques are considered
- Early recognition is key and ventricular septal rupture should be in the differential diagnosis of acute hypotension and shock following AMI

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