BAD THINGS COME IN THREES

A Case of Ventricular Septal Rupture Post-Myocardial Infarction with COVID-19 Infection

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INTRODUCTION

Ventricular Septal Rupture (VSR) is a rare and dreaded mechanical complication of acute myocardial infarction (AMI). With significant improvements in acute reperfusion therapies, VSR has become increasing rare, complicating 0.17-0.31%[1] of AMI patients, however mortality rate remained at 41-80%[1]. It usually occurs 2-8 days after an AMI and with similar frequency in anterior and inferior/lateral infarctions[2]. It warrants early recognition with high index of suspicion, even within 48 hours after a successful reperfusion therapy as illustrated by our case.

HISTORY OF PRESENTATION

An 80-year-old gentleman with no known medical illness, presented with sudden onset of chest pain. General examination showed HR 78 bpm, sinus rhythm; BP 155/94 mmHg; lungs and CVS unremarkable. Electrocardiogram on arrival showed anterolateral ST-segment elevation consistent with acute extensive anterior STEMI. Initial echocardiography showed LVEF 45-50% with anterior and lateral hypokinesia. He was successfully re-perfused with Streptokinase and was listed for pharmaco-invasive procedure the following day.

CLINICAL COURSE

In the following morning, he developed hypotension and acute pulmonary edema with new onset of harsh pansystolic murmur on auscultation. An immediate bedside echocardiography revealed an apical VSR with left-to-right shunt and gradient across of 58mmHg, seen in most standard views - modified PLAX, PSAX apical level, apical 4Ch, apical 3Ch and subcostal views. LVEF was 35-40% with anteroseptal, anterolateral and apical LV wall hypokinesia, normal right chambers and main pulmonary artery size with preserved RV function, TAPSE 2.6cm. There's moderate TR with SPAP 51 mmHg, and no PR. IVC was 2.3cm with collapsibility <50%.

An urgent Cardiothoracic surgical referral was made, and pre-operative coronary angiography revealed two vessel disease with discrete mid-LAD 80% stenosis and distal LCx 90% stenosis. An Intra-aortic balloon pump was inserted, and he was listed for emergency CABG and VSR repair.

Unfortunately, he was discovered to have concurrent COVID-19 infection prior to surgery, his condition took a turn for the worse with increasing oxygen requirement and his surgery was deferred. He developed worsening cardiogenic shock, multiple episodes of paroxysmal atrial fibrillation and acute renal failure. Despite the best efforts, he unfortunately succumbed in about 72 hours from his diagnosis of STEMI.

DISCUSSION

This case illustrates an early VSR occurring in less than 48 hours after reperfusion therapy. Prompt diagnosis with echocardiography with adequate views is the key, especially in post-reperfusion patients who developed hemodynamic instability with new onset of systolic murmur. Definitive surgery, though associated with high mortality, remains the mainstay treatment, although percutaneous VSR closure has been attempted.

CONCLUSION

High clinical suspicion and thorough examination, with urgent echocardiographic assessment are important for prompt diagnosis of mechanical complications of myocardial infarction, especially VSR.

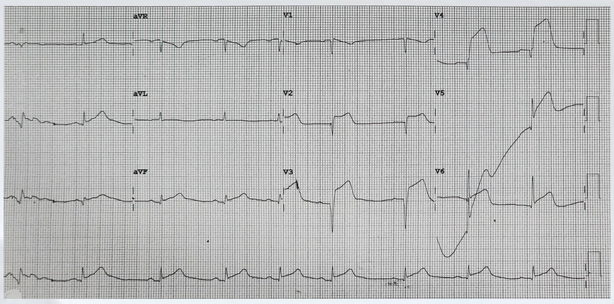

FIGURE 1: Initial electrocardiogram consistent with acute extensive anterior STEMI.

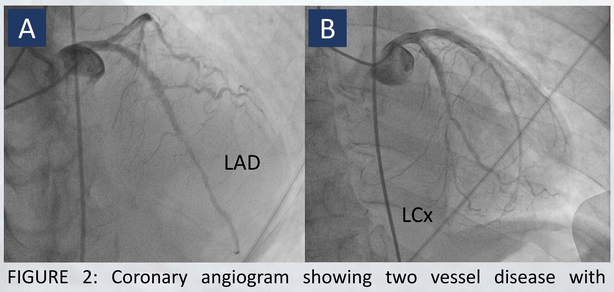

FIGURE 2: Coronary angiogram showing two vessel disease with discrete mid-LAD 80% stenosis (A) and distal LCx 90% stenosis (B).

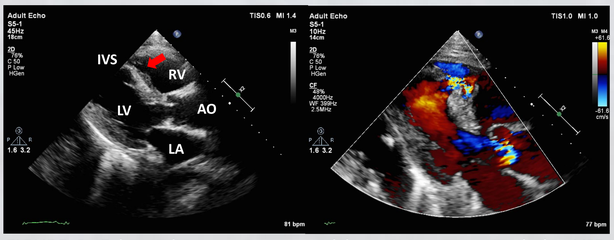

FIGURE 3: Echocardiogram parasternal long axis view revealed a VSR with left-to-right shunt.

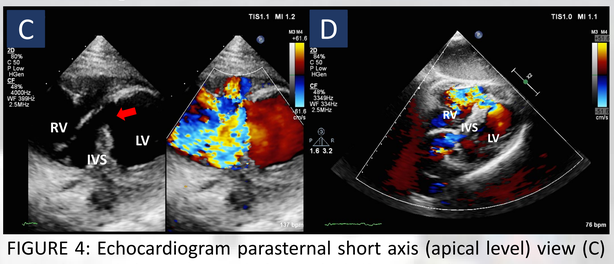

FIGURE 4: Echocardiogram parasternal short axis (apical level) view (C) and subcostal view (D) revealed an apical VSR with left-to-right shunt.

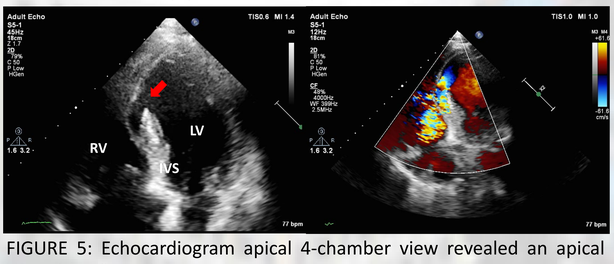

FIGURE 5: Echocardiogram apical 4-chamber view revealed an apical VSR with left-to-right shunt.

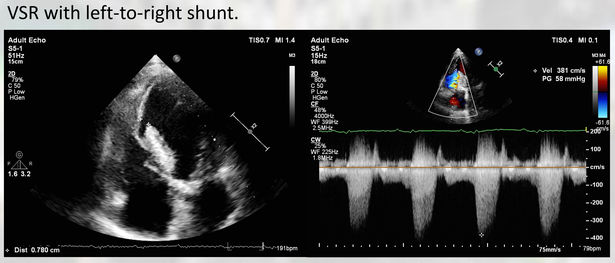

FIGURE 6: Echocardiogram showing VSR size of 0.78 cm.

FIGURE 7: Echocardiogram showing pressure gradient of 58mmHg across the VSR.

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