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Left Ventricular Free Wall Rupture Revealed by Periprocedural Echocardiography in a Patient with Extensive Anterior STEMI: A Fatal Case Report

Abstract

Introduction: Left ventricular (LV) rupture is a rare but often fatal complication of acute myocardial infarction (AMI). Its diagnosis relies heavily on urgent imaging, particularly echocardiography.

Case presentation: We report the case of a 58-year-old woman with no known cardiovascular risk factors, admitted for acute chest pain that began 6 hours prior. The electrocardiogram (ECG) revealed an extensive anterior ST-elevation myocardial infarction (STEMI). While being transferred to the catheterization lab, she suddenly developed agonal breathing and electromechanical dissociation. Emergent transthoracic echocardiography demonstrated a left ventricular free wall rupture with massive hemopericardium. Despite 45 minutes of cardiopulmonary resuscitation, the patient died.

Conclusion: This case illustrates the dramatic course of LV rupture during the acute phase of myocardial infarction, highlighting the crucial role of echocardiography for immediate diagnosis in the cath lab.

Keywords

myocardial rupture, ST-elevation myocardial infarction, echocardiography, hemopericardium, sudden cardiac death

Introduction

Left ventricular free wall rupture is a rare but life-threatening mechanical complication of acute myocardial infarction, typically occurring within 24 to 48 hours. It usually presents as sudden hemodynamic collapse with cardiac tamponade and has a high mortality rate, especially when surgical intervention is unavailable. We report a fatal case of myocardial rupture captured in real-time during transfer to the cath lab and documented by transthoracic echocardiography.

Case Presentation

A 58-year-old woman with no modifiable cardiovascular risk factors presented to the emergency department with acute chest pain lasting 6 hours. On examination, she was conscious, hemodynamically stable (BP 164/90 mmHg, HR 90 bpm), with no signs of heart failure, and reported severe chest pain (EVA 8/10).

Her ECG showed extensive anterior ST-segment elevation, consistent with an acute anterior STEMI. She was promptly transferred to the catheterization room.

While being positioned on the cath lab table, the patient suddenly began gasping, followed by pulseless electrical activity. An emergent bedside echocardiogram revealed a massive hemopericardium and left ventricular free wall rupture. Cardiopulmonary resuscitation was initiated but was unsuccessful after 45 minutes.

Discussion

Free wall rupture of the left ventricle (LV) is one of the most feared mechanical complications of acute myocardial infarction (AMI). Despite advances in early reperfusion strategies, it still occurs in 0.5–1% of all AMIs and remains associated with high mortality, particularly in the absence of immediate surgical intervention.

Several risk factors have been described, including older age, female sex, first myocardial infarction, absence of collateral circulation, persistent hypertension at admission, and delayed reperfusion therapy. Interestingly, our patient did not present with any classical modifiable cardiovascular risk factors, nor with clinical signs of heart failure on admission—underscoring the unpredictable nature of this complication.

In the case described by Diemer et al. (2003), a 67-year-old male patient without prior history of heart disease developed a free wall rupture of the LV shortly after the onset of chest pain. Unlike our case, early recognition and prompt surgical intervention allowed for survival and full recovery, illustrating the importance of timely echocardiographic assessment and emergency surgery. Available at: <https://www.em-consulte.com/article/109859>

Our case is distinguished by its fulminant evolution: the rupture occurred while the patient was being positioned in the cath lab, leading to electromechanical dissociation. Emergent transthoracic echocardiography confirmed a massive hemopericardium due to LV rupture. Despite immediate and prolonged cardiopulmonary resuscitation, the outcome was fatal.

This case reinforces the value of point-of-care echocardiography in the early identification of life-threatening complications during the acute phase of STEMI. It also emphasizes the need for high vigilance, even in patients who appear clinically stable and lack typical risk factors.

Conclusion

Left ventricular free wall rupture is a dramatic complication of STEMI. Rapid diagnosis through echocardiography is vital for any chance of survival. This case emphasizes the need for high clinical suspicion and intensive monitoring, even in patients with no typical risk factors.

Figures and Videos

Figure 1: Transthoracic echocardiogram (apical 4-chamber view) showing a discontinuity in the LV free wall (red arrow), suggestive of myocardial rupture.

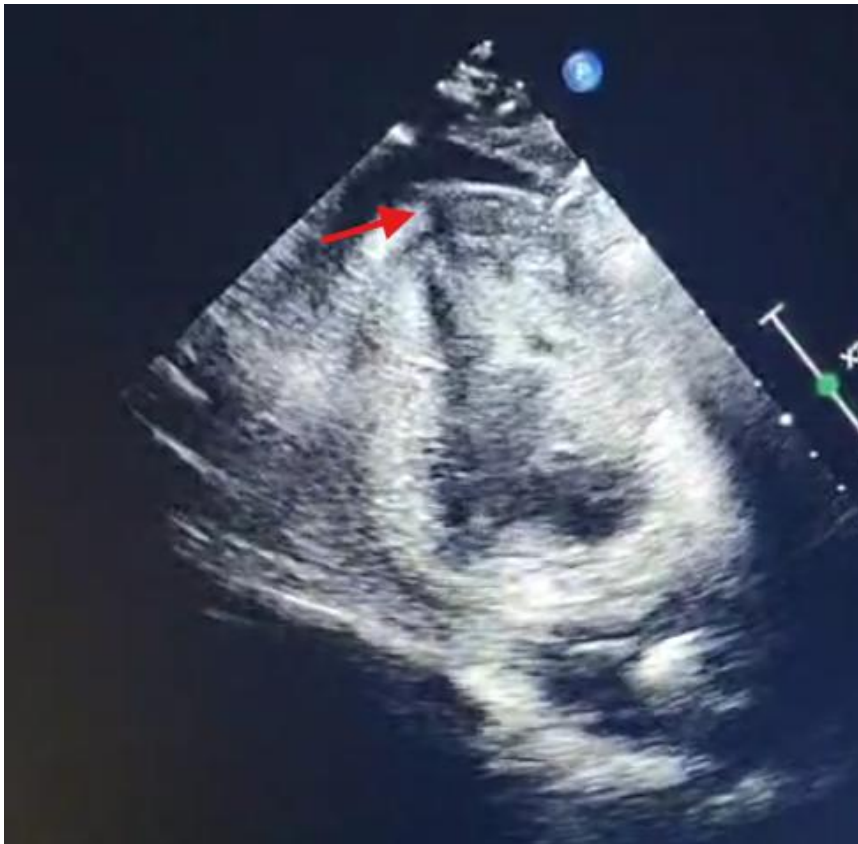
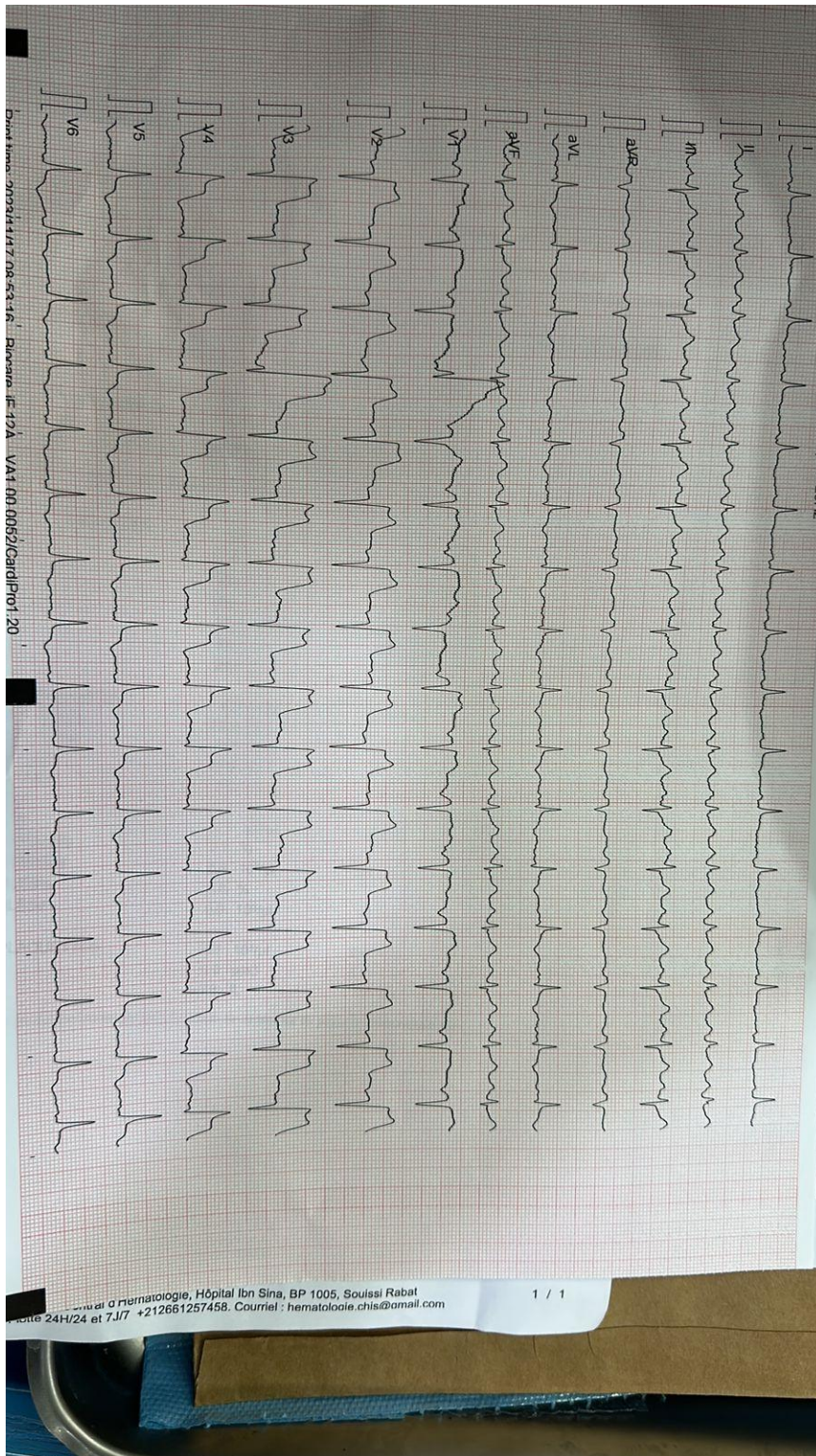


Figure 2: 12-lead ECG showing extensive anterior ST-segment elevation (V1–V6).



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84 Video 1: Dynamic view of the rupture defect (rupture.mp4).

85 Video 2: Additional view confirming the rupture (rupture 2.mp4).

86 Video 3: Visualization of massive hemopericardium (hemopericarde.mp4).

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