

# Large Biventricular Thrombosis in Acute Myocardial Infarction Assessed at CT Scan

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## Abstract

**Background:** Ventricular thrombosis represents a not uncommon complication of Acute Myocardial Infarction (AMI) and Left Ventricular (LV) thrombosis may complicate large anterior ST-elevation myocardial infarction with anteroapical aneurysm. Right ventricular thrombosis is a more rare complication of inferior infarction. Transthoracic echocardiogram is routinely performed in patients with AMI to assess left ventricular function and the occurrence of thrombotic complications. However, other imaging techniques are occasionally required to more clearly evaluate thrombus extent and endocardial border line.

**Methods:** We report a case of biventricular thrombosis firstly found at echocardiograph examination; the exact extension of biventricular thrombosis, however, was more clearly defined at CT scan.

**Results:** In case of large ventricular thrombosis, CT scan may be useful in the exact definition of thrombus extension when cardiac magnetic resonance is not feasible.

**Conclusion:** When transthoracic ultrasonography does not allow adequate characterization of the thrombus and cardiac magnetic resonance is not feasible, CT scan can provide additional definition of cardiac walls and the extent of the thrombus.

**Keywords:** Acute myocardial infarction • Bi-Ventricular thrombosis • Cardiac CT

## Introduction

We report the case of a 60-year-old man admitted to cardiac care unit with a two-week history of chest pain, dyspnoea, hemoptysis and fever; except for smoking habit, no further cardiovascular risk factors were present [1-6].

## Case Report

Electrocardiogram showed sinus tachycardia (115 bpm), ST-elevation in V1-V5 leads with Q-waves (Figure 1). Pulmonary edema and bilateral pleural effusion were found at chest X-ray. Coronary angiography showed total occlusion of mid Left Anterior Descending (LAD) coronary and 75% stenosis of mid Right Coronary Artery (RCA). After thrombus aspiration, LAD angioplasty and drug-eluting stenting (3.0 × 22 mm), final distal LAD patency was sub-optimal (Figure 2), presumably because of very late coronary reperfusion.

Transthoracic echocardiogram at admission showed impaired LV ejection fraction (20%), apical akinesia, and lateral wall aneurysm with a wide hyperechogenic area from the medium portion of interventricular septum to the apex as for a mural thrombus (Figure 3). Anticoagulant therapy with enoxaparin and warfarin was therefore started. Given the poor patient's compliance (orthopnea), cardiac CT scan was performed for a more clear definition of ventricular thrombosis. LV aneurysm with eccentric mural thrombus adhering to the medium and apical segment of interventricular septum and LV anterior wall (max 22 mm). The underlying LV wall was thinned but integer. On the right

side of mid interventricular septum a thrombus was also (Figure 4). Two weeks later, the patient underwent coronary angioplasty of RCA (2.75 × 15 mm) with optimal coronary flow. The patient was discharged and finally underwent heart surgery with LV aneurysmectomy.

## Discussion

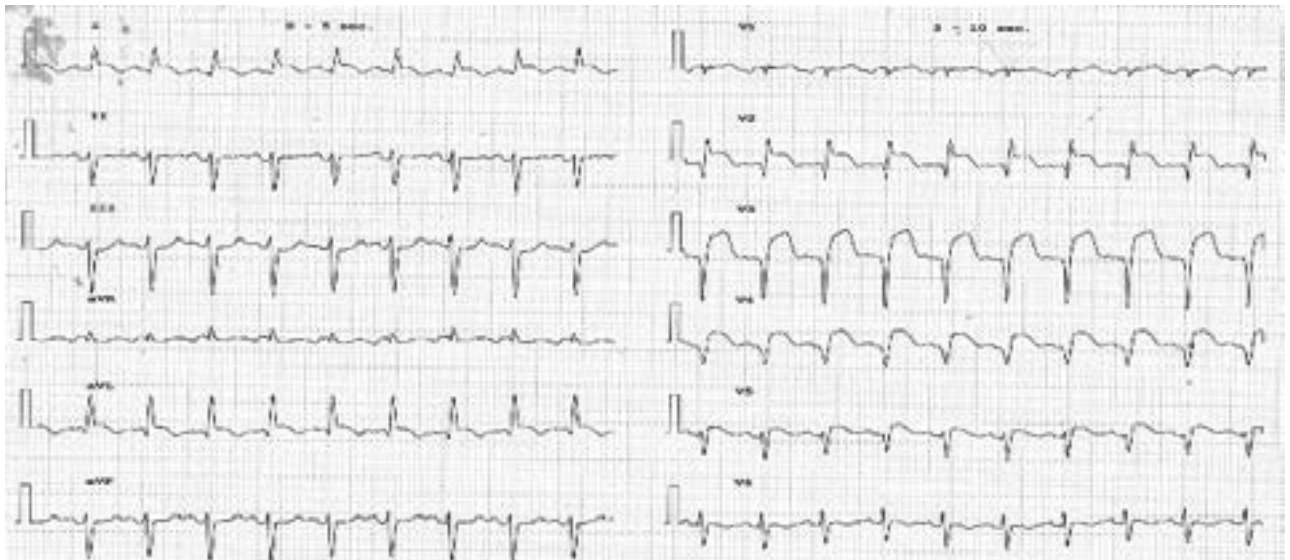
We report a case of biventricular thrombosis following AMI and LV aneurysm. Late reperfusion, presumably weeks after onset of AMI, did not succeed in restoring LV contractility. Despite the paramount role of transthoracic echocardiogram for the initial assessment of patient with AMI [7], advanced techniques with greater sensitivity and specificity can be useful to exactly define the extension of thrombus. CT scan is usually utilized for the study of coronary vessels but may also be useful to a better definition of cardiac structures when cardiac magnetic resonance is not feasible [8,9]. In case of ventricular aneurysm, a large area of poorly contracting cardiac muscle may lead to thrombus formation. LV thrombosis is more common in case of large anterior infarction, ventricular aneurysm, multivessel coronary artery disease and ejection fraction ≤ 40% [10,11]. Right ventricular thrombus is less frequent and occurs almost exclusively in acute pulmonary embolism [12-14], right ventricle infarction and dilatative cardiomyopathy [15,16].

Thrombus usually develops within 2 weeks of MI. Ventricular thrombus on echocardiography is defined as a discrete echo-dense mass in the left ventricle with defined margins that are distinct from the endocardium and seen throughout systole and diastole. It should be located next to a hypokinetic or akinetic ventricular area and seen from at least two views (usually apical and short axis) [17]. Depending on the shape, thrombus can be mural (flat, with a concave edge, which follows the curvature of the wall) or protruding (floating, with a convex edge) and differentiate on the basis of mobility, size and echogenicity. These features correspond to a different risk of embolization which is low for mural thrombus, with concave edge and large base or of small size while is high for floating thrombus, with convex edge and narrow base or of big size. Anticoagulant therapy is aimed at the prevention of peripheral embolization, in particular of stroke [18,19].

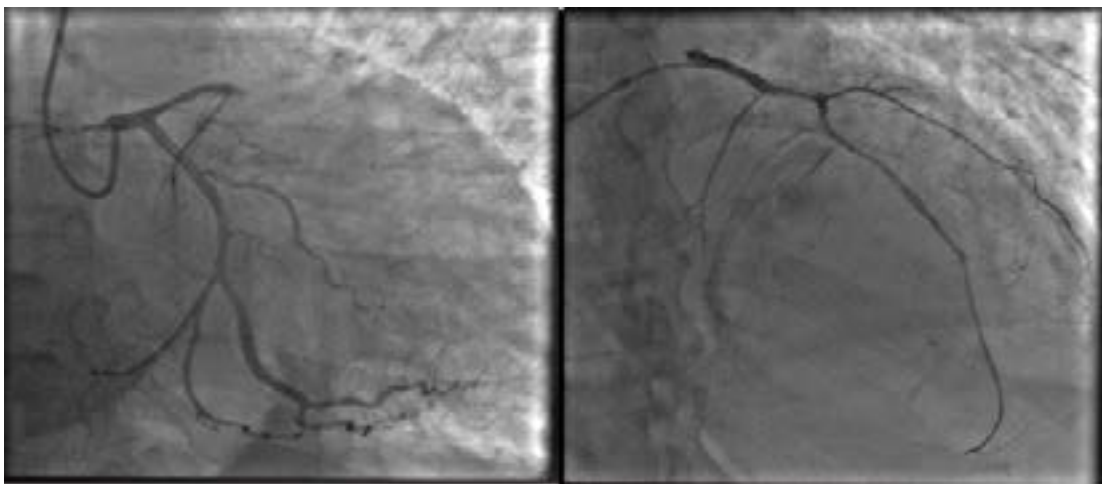
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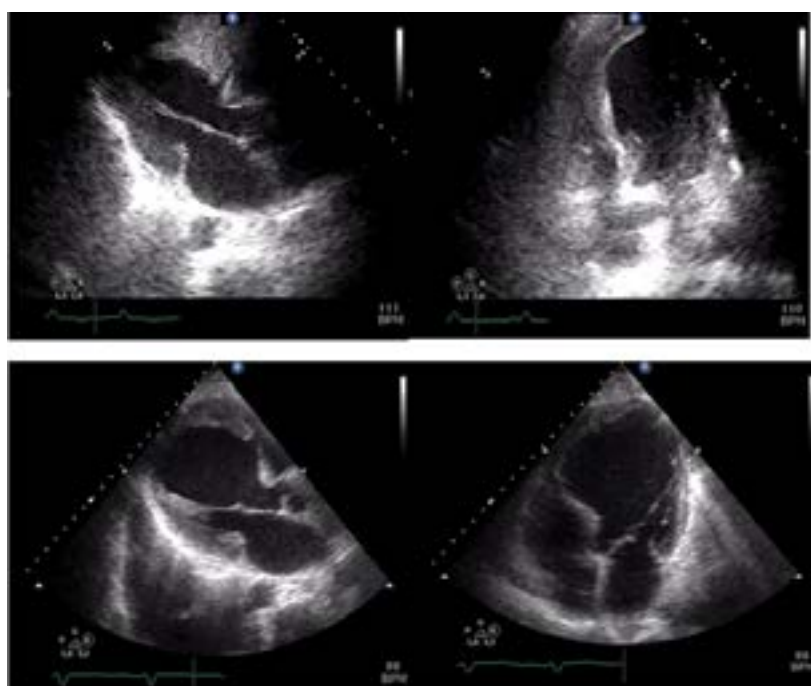
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**Figure 1.** Admission electrocardiogram showing anterior ST-elevation with Q-waves.



**Figure 2.** Coronary angiography showing LAD occlusion (left) and final result after coronary angioplasty (right). Despite coronary patency, LAD dimension indicates a poor coronary micro-circulation.



**Figure 3.** Transthoracic echocardiogram at admission (up) and 2 weeks later (down) showing large ventricular aneurysm with thrombosis.



**Figure 4.** Cardiac CT scan showing large apical thrombus with thinned left ventricular wall.

## Conclusion

The development of apical thrombi frequently occurs after large AMI with LV aneurysm. When transthoracic ultrasonography does not allow adequate characterization of the thrombus and cardiac magnetic resonance is not feasible, CT scan can provide additional definition of cardiac walls and the extent of the thrombus.

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