

The Value of Cardiac MRI in the Diagnosis of Left Intraventricular Apical Thrombus after Myocardial Infarction: A Case Report

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Abstract

Case Report

Left ventricular thrombus is a dreadful complication in post-myocardial infarction and should be researched, especially in patients with ventricular dysfunction, given the high thromboembolic risk in these patients. Several studies have shown that transthoracic echocardiography (TTE) lacks specificity when compared with cardiac magnetic resonance imaging (MRI) in the discovery of intraventricular thrombus. However, MRI remains a costly and time-consuming examination, especially in developing countries. In our clinical case, cardiac MRI enabled us to diagnose an apical intra-LV thrombus in the post-infarction period, which guided us in the correct management of the patient and avoided any thromboembolic complications. Today, cardiac MRI confirms its value as a reference imaging tool in the management of ischemic heart disease.

Keywords: Intraventricular thrombus; Myocardial infarction; Cardiac MRI; Echocardiography.

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INTRODUCTION

Despite the many imaging modalities available in cardiology, the identification of a thrombus complicating a myocardial infarction (MI) remains a constant concern for clinicians. The question arises as to whether the investigation should be extended to include other paraclinical investigations to complement transthoracic echocardiography, such as cardiac MRI, which has been shown to be superior in diagnosing intra-left ventricular thrombotic complications [3-5].

Advances in reperfusion and anti-thrombotic therapies have reduced the incidence of this type of complication, but in our context, we are always faced with some patient who arrives at the emergency department more than 24 hours after MI. We will discuss a clinical case of a patient presenting with MI

complicated by an apical thrombus not visualized on echocardiography.

CASE REPORT

A 66-year-old male patient who was a smoker, diabetic, obese and hypertensive he was admitted to hospital on day 2 for ST elevation myocardial infarction (STEMI) complicated by left heart failure. Clinical examination on admission revealed a patient suffering from heart failure with a blood pressure of 100/60 mmHg, a heart rate of 100 beats/min and an O₂ saturation of 90%. Auscultation of the heart was normal.

Pleuropulmonary examination revealed crepitant rales at the bases. The electrocardiogram (ECG) on admission showed a regular sinus rhythm with a ventricular rate of 100 cycles per minute on treatment, an anterior ST-segment elevation and a Q wave of necrosis in the profound septal region (Figure 1).

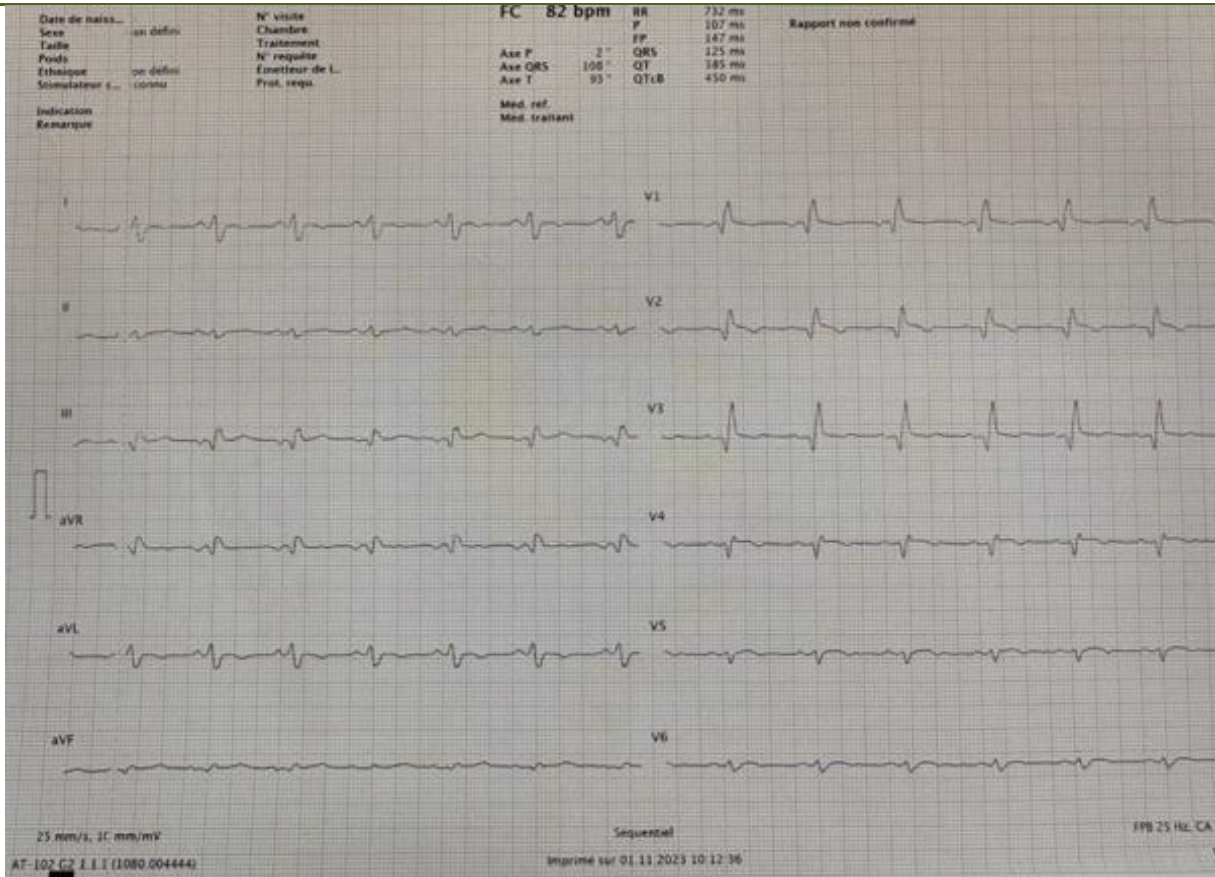


Figure 1: ECG showing ST segment elevation anteriorly and Q wave of necrosis in the profound septal region

Transthoracic echocardiography (TTE) revealed ischemic heart disease with an impaired left ventricular ejection fraction (LVEF) in the range of 30%.

The left ventricle is dilated with segmental impairment of myocardial contractility and anteroseptal and apical akinesia (Figure 2) in addition, the left atrium is dilated.

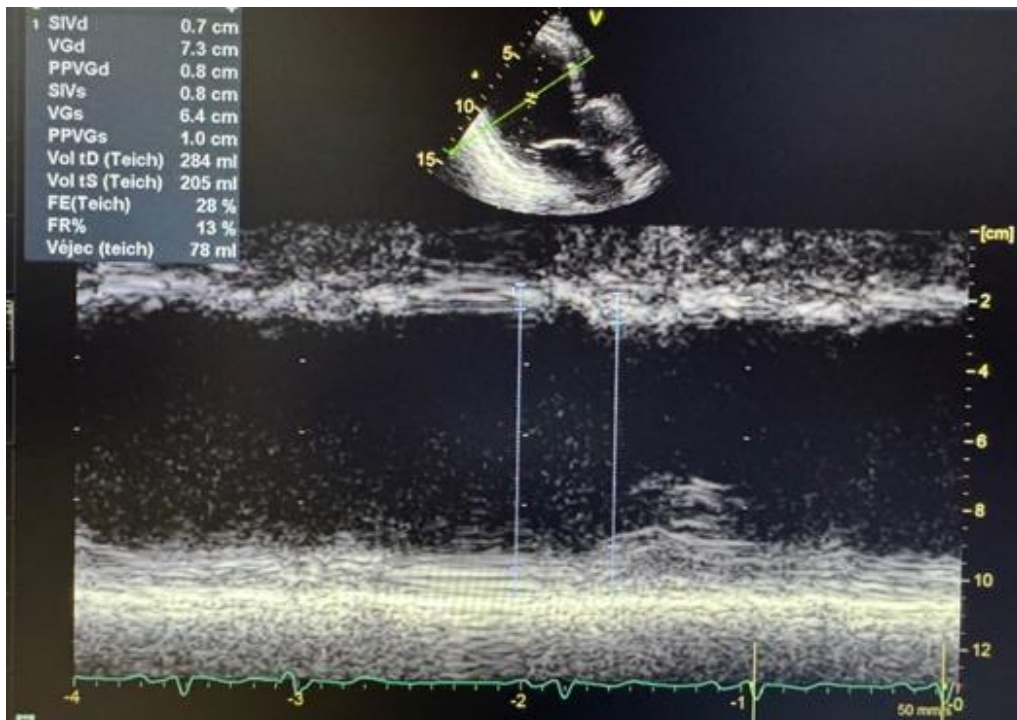


Figure 2: Transthoracic echocardiography in the TM section showing LV dilatation with LV systolic dysfunction

In view of this presentation, the patient was put on anti-ischemic and anti-thrombotic medication, as well as treatment for heart failure. Cardiac MRI was performed one week after the MI and showed a dilated LV in systolic dysfunction with severe impairment of LVEF to 25%. Akinesia of the anteroseptal and apical

wall in the hemodynamic sequences, an anterior perfusion defect in the first gadolinium passage sequences. In the late phase of enhancement, a well-demarcated apical thrombus of the left ventricle was seen, measuring 18 mm / 7 mm (Figure 3).

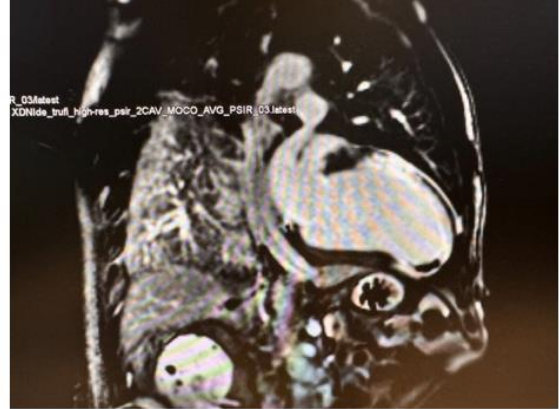
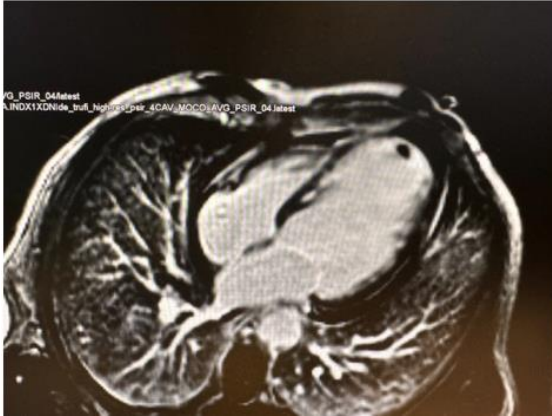


Figure 3: Cardiac MRI showing apical thrombus in 2 cavities and 4 cavities in the late enhancement sequence

DISCUSSION

The diagnosis of intraventricular thrombus after myocardial infarction remains difficult in practice, despite the many cardiac imaging tests available. Transthoracic echocardiography is the first-line test for diagnosing, monitoring and managing complications of myocardial infarction. It is a key examination in this management, especially as it is available, simple and inexpensive. However, the lack of sensitivity of echocardiography in this complication, despite the fact that it is specific in the search for this pathology, continues to leave us in doubt about thromboembolic complications [1, 2]. Currently, it seems impossible to formally rule out the diagnosis if the examination is normal. However, cardiac MRI is currently improving sensitivity in the search for intracardiac thrombi, and several studies have demonstrated the superiority of MRI over TTE in the detection of intracardiac thrombi [3-5].

The late-phase enhancement sequences after gadolinium injection are the main part of the examination. The thrombus appears as a black mass within the cavity, clearly distinguishable from the blood and adjacent myocardium [6-8]. In our clinical case, an intraventricular thrombus could not be visualized on TTE after MI, even after a follow-up on day 5. After clinical improvement and hemodynamic stability, our patient underwent cardiac MRI on day 10 post-MI, which showed an apical left intraventricular thrombus.

The diagnosis of thrombus allowed us to maintain anticoagulation with anti-vitamin K and in this way to prevent any thromboembolic complications or invasive investigations. The viability test was programmed after the thrombus had disappeared, using cardiac MRI at 3 months post-MI.

Dobutamine stress echocardiography for signs of viability was positive in the anteroseptal area, and coronary angiography showed a small-caliber lesion of the distal anterior interventricular (AIV) with occlusion of the small-caliber 3rd coronary artery requiring medical treatment. There was grade 2 stenosis of the right coronary artery and the ostium of the posterior interventricular (PVI). The right-sided lesions underwent angioplasty using two stents, with good clinical outcome.

CONCLUSION

Cardiac MRI is currently the most accurate modality for detecting left ventricular thrombi in post-MI, while transthoracic echocardiography remains the gold standard in the management of acute myocardial infarction. The physician must manage these various paraclinical examinations according to the availability and expertise of the hospital team as well as the cost-effectiveness of each examination, in order to ensure the best management of the patient.

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