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Left Ventricular True Aneurysm with Subacute Myocardial Rupture: An Early and Unusual Post Infarction Complication

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Abstract | **Case Report**

Left ventricular true aneurysm is a rare complication of myocardial infarction which is usually diagnosed few weeks or months after the infarction; it is mostly founded in the anterior or apical wall. Left ventricular (LV) true aneurysm can rarely lead to myocardial rupture which is a catastrophic complication requiring an urgent surgical treatment. We are describing a case of a 63 year-old male heavy smoker with a medical history of angina fifteen days earlier with normal echocardiography, the patient underwent a coronary angiographic examination that showed a severe triple vessel stenosis. He was advice to undergo a coronary artery bypass graft surgery, but declined the procedure, so a percutaneous coronary intervention with stents implantation in the three vessels was performed. Ten days after discharge, the patient suffered from chest pain. He presented three days later to the hospital with worsening symptoms and pulmonary edema. Surface electrocardiogram showed a low voltage, with pathological Q wave in leads III, avF. Transthoracic echocardiogram showed a moderate left ventricular systolic dysfunction, inferior LV aneurysm and a moderate-sized pericardial effusion. The patient immediately underwent a diagnostic coronary angiography demonstrating no stent occlusion. Cardiac magnetic resonance imaging (MRI) revealed a moderately depressed ejection fraction, a moderate pericardial effusion, and a large aneurysm arising at the border between inferolateral and anterolateral wall segments. Moreover it suspected a thrombus in the pericardial space probably secondary to a myocardial rupture. The patient was offered an immediate surgical treatment which confirmed the MRI findings. This case is excessively rare; it shows a left ventricular true aneurysm arising at the border between inferolateral and anterolateral wall, which occurred only three days after myocardial infarction. The implication of this case is the decisive role of MRI to differentiate the true aneurysm from the false aneurysm, and to suspect the myocardial rupture.
Keywords: true aneurysme, infarction, myocardial rupture, MRI.

INTRODUCTION

Left ventricular (LV) true aneurysm used to be common complication of myocardial infarction but its incidence has declined due to the early and efficient management of acute coronary syndrome. It is usually arising from the anterior or apical wall, and it is the consequence of the expansion of the necrotic myocardium in the first days after myocardium, but the majority of cases in literature are reported after few weeks or months after infarction. Left ventricular true aneurysm can rarely lead to myocardial rupture which is a catastrophic complication requiring an urgent surgical treatment.

We are describing a very rare case of a patient with LV true aneurysm arising from the inferolateral wall appearing only three days after an inferior myocardial infarction, complicated by a subacute myocardial rupture suspected by the Cardiac magnetic resonance imaging (MRI) findings and requiring an immediate surgical treatment.

CASE REPORT

We report a case of a A 63 year-old male heavy smoker with a medical history of angina 15 days earlier with normal echocardiography, the patient underwent a coronary angiographic examination that showed a severe triple vessel stenosis. He was advice to undergo a coronary artery bypass graft surgery, but declined the procedure, so a percutaneous coronary intervention with stents implantation in the three vessels was performed.

Ten days after discharge, the patient suffered from a severe chest pain and shortness of breath. He presented three days later to the hospital with worsening symptoms and acute respiratory failure due to pulmonary edema. Surface electrocardiogram showed a

low voltage, with pathological Q wave in leads III, avF; negative t wave in lateral leads, and ST segment depression in leads V2 and V3. Transthoracic echocardiographic examination provided the following information: akinesia of the anterolateral wall, severe hypokinesia of the inferolateral wall with a moderate left ventricular systolic dysfunction, and inferior LV aneurysm, it also showed a moderate-sized and localized pericardial effusion, there were no mitral regurgitation. The patient immediately underwent a diagnostic coronary angiography demonstrating no stent occlusion. Cardiac (MRI) revealed a moderately depressed ejection fraction, a moderate pericardial effusion, and a large aneurysm formation (36 x 33 mm) arising at the border between inferolateral and anterolateral wall segments with a wide neck (37mm), Moreover This examination suspected a thrombus in the pericardial space probably secondary to a myocardial rupture. Late gadolinium enhancement MRI depicts transmural infarct in the inferolateral wall. The patient was offered an immediate surgical treatment which confirmed the MRI findings.

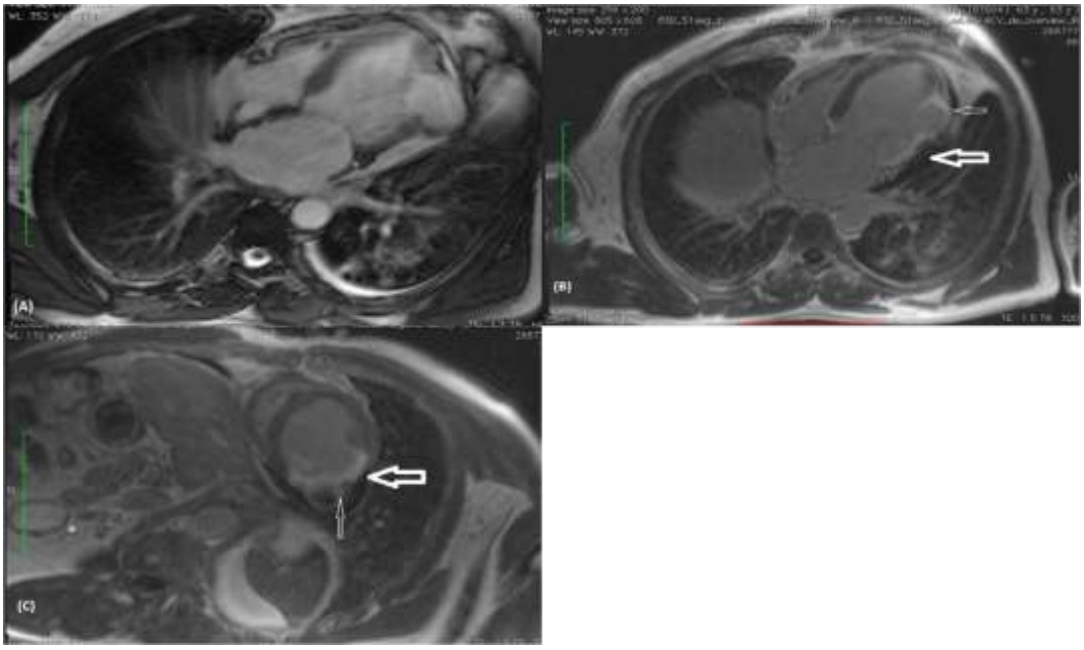

Fig-1: cardiac MRI: Cine four chamber view showing a large aneurysm formation (36 x 33 mm) with a wide neck (37mm) (A). Late gadolinium enhancement (LGE) in short apical four chamber view (B), and short axis view (C) showing a large aneurysm arinsing at the border between inferolateral and anterolateral wall segments, with full thickeness LGE in its wall (small arrows) and pericardial effusion (large arrows)

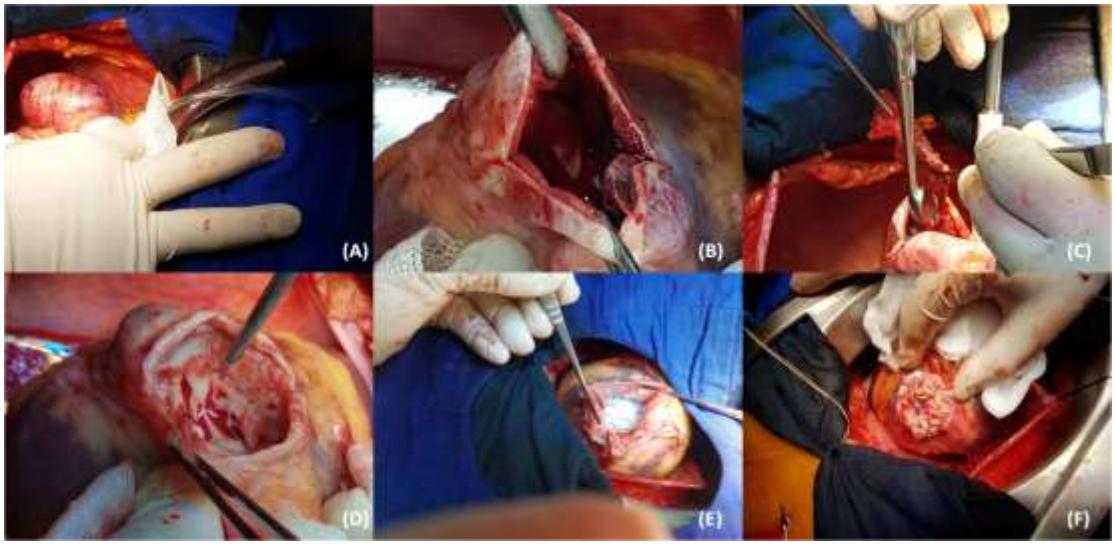

Fig-2: Intra operative time: surgical view showing a true aneurysme. A large perforation (4 cm) was found after removing a thrombus (A). The true aneurysm was opened (B). Aneurysectomy before the reconstruction (C, D). Closure of the defect with dacron patch (E). Result of reconstraction (F)

DISCUSSION

Left ventricular true aneurysm is most commonly a complication of myocardial infarction; it is a bulging of the thickened myocardium. Its incidence is 5% of patients with transmural infarction [1]. It has de¬clined due to the early and efficient management of acute coronary syndrome in its early phase.

Left ventricular true aneurysm is more found in the anterior or apical wall, and rarely inferior or lateral wall. This preponderance can be explained by the involvement of the posterior papillary muscle in extensive infarction of the inferior myocardial wall, which induces a severe mitral regurgitation and death [2, 3].

Even if, in literature, cases of left ventricular true aneurysms have mostly been reported after few months or years after transmural infarction, and some authors suggested that aneurysm is a chronic complication resulting of a progressive dilatation after few weeks of the infarction; time of left ventricular aneurysm formation begins from day 1 after infarction, that has been confirmed by several studies [4,5]. The precursor of aneurysm formation is an infarct expansion few hours after acute MI, then after one to five days, aneurysmal shape changes will deform the infarcted transmural wall due to increased systolic wall tension (according to Laplace's law). This shape changes occur before scare formation and will determinate the aneurysm occurrence (relates to infarct size). That finding proves that aneurysm is the result of the expansion of the necrotic myocardium in the first days and not to late dilatation of scar tissue. Thus, evidence of aneurysm in transthoracic echocardiography can be observed on the first days after infarction as reported in Meyzlish' study [4] and that explain the early formation of the aneurysm in our case.

MRI has an excellent tissue characterization, it is the best technique to determinate the left ventricular size and function, to diagnosis true aneurysm and to differentiate it from pseudo-aneurysm: in the true aneurysm the neck is wide and the transition from normal myocardium to thinned myocardium is smooth [6]. Late gadolinium enhancement MRI is useful to diagnostic and to localize the area of infarction, and to delineate the transmural extent of fibrous scarring. In this case the MRI played a decisive role for the diagnostic of the true aneurysm and the infarct as a cause of the aneurysm

Left ventricular true aneurysm can lead to many complications such as heart failure, lethal ventricular arrhythmias, systemic thromboembolism, and ventricular rupture which is a very rare but catastrophic complication. The myocardial rupture can be acute and lead to cardiac tamponade and sudden death or subacute if the site of rupture is sealed by a thrombus.

Surgical treatment of LV true aneurysm is only needed for the treatment of those complications, according to 2013 ACCF/AHA Guideline for the management of ST-elevation myocardial infarction [1]. Our patient had a high suspicion of subacute myocardium rupture in the MRI which showed moderate pericardial effusion and a thrombus in the pericardium. He was given a surgical exploration that confirmed the LV true aneurysm and the myocardium rupture.

CONCLUSION

The observation discussed here is excessively rare; it shows a left ventricular true aneurysm arising at the border between inferolateral and anterolateral wall, which occurred only 3 days after myocardial infarction The implication of this case is the decisive role of MRI to differentiate the true aneurysm from the false aneurysm, to diagnose the infarction and to suspect the myocardial rupture.

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