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### RESEARCH ARTICLE

#### GIANT LEFT VENTRICULAR THROMBOSED ANEURYSM

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#### Abstract

Left ventricular aneurysms are a frequent complication of myocardial infarction and are most commonly located at the ventricular apex. We report the case of a 61-year-old man who was admitted for congestive heart failure turning out to be related to a huge thrombosed aneurysm diagnosed with cardiac imaging.

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#### Introduction: -

Left ventricular (LV) aneurysms are a frequent complication of acute extensive myocardial infarction and are most commonly located at the ventricular apex. A timely diagnosis is vital due to the serious complications that can occur, including heart failure, thromboembolism, or tachyarrhythmias.<sup>1</sup>

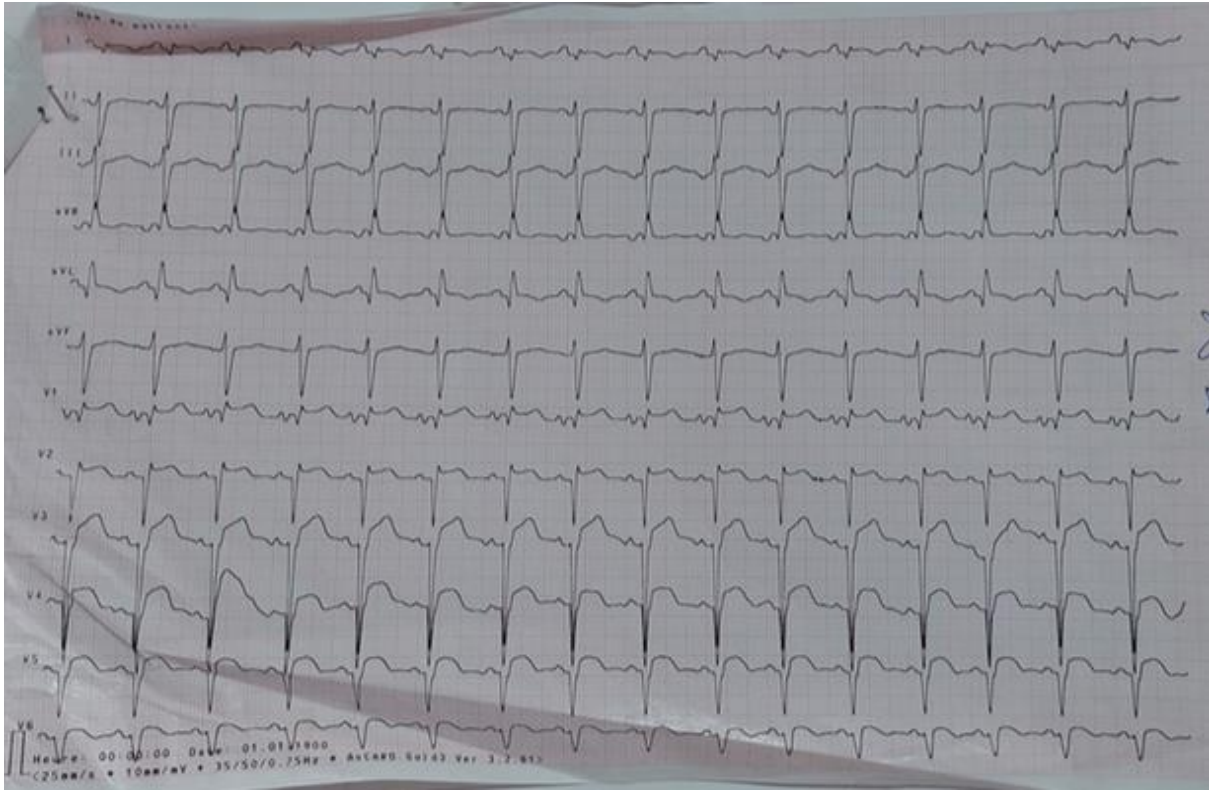
The benefits of surgical repair of left ventricular aneurysm have long been debated.

#### Case Report:

We report the case of a 61-year-old man with no cardiovascular risk factors, presenting to the emergency department with a stage III dyspnea associated with an oedema of the lower limbs. During the investigation, we learned that he presented an acute chest pain one week before, associated with sweating. On admission, his blood pressure was at 94/74 mmHg, and his heart rate at 92 bpm. Physical examination revealed signs of congestive heart failure with coarse crackles at the lung bases and lower extremity edema at the ankles. The electrocardiogram showed a regular sinus rhythm at 85 beats per minute and Q wave necrosis associated with an elevation of the ST segment in the extended anterior derivations(Figure1).

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**Figure 1:-** Electrocardiogram showing Q wave necrosis associated with an elevation of the ST segment in the extended anterior derivations.

Transthoracic echocardiography revealed a dilated left ventricle with akinesia of the apex and its adjacent segments, akinesia of the septal wall and the middle segments of the inferior and anterior walls with a huge thrombosed aneurysm of the apex, measuring 64 x 53 mm, and a reduced systolic left ventricular function at 38% without significant mitral regurgitation (Figure 2 ).



**Figure 2:-** Transthoracic echocardiography image showing a dilated left ventricle with a huge thrombosed aneurysm of the apex, measuring 64 x 53 mm.

Given the uncertainty surrounding the differential diagnosis, cardiac magnetic resonance imaging (MRI) was performed, showing an aspect of ischemic heart disease at the dilated stage with disorders of segmental kinetics, a reduced systolic function and an apical aneurysm of the LV measuring 63x75x71 mm and containing a thrombus. It revealed a non-viable necrotic sequelae in the akinetic territory of the anterior interventricular artery (Figures 3).

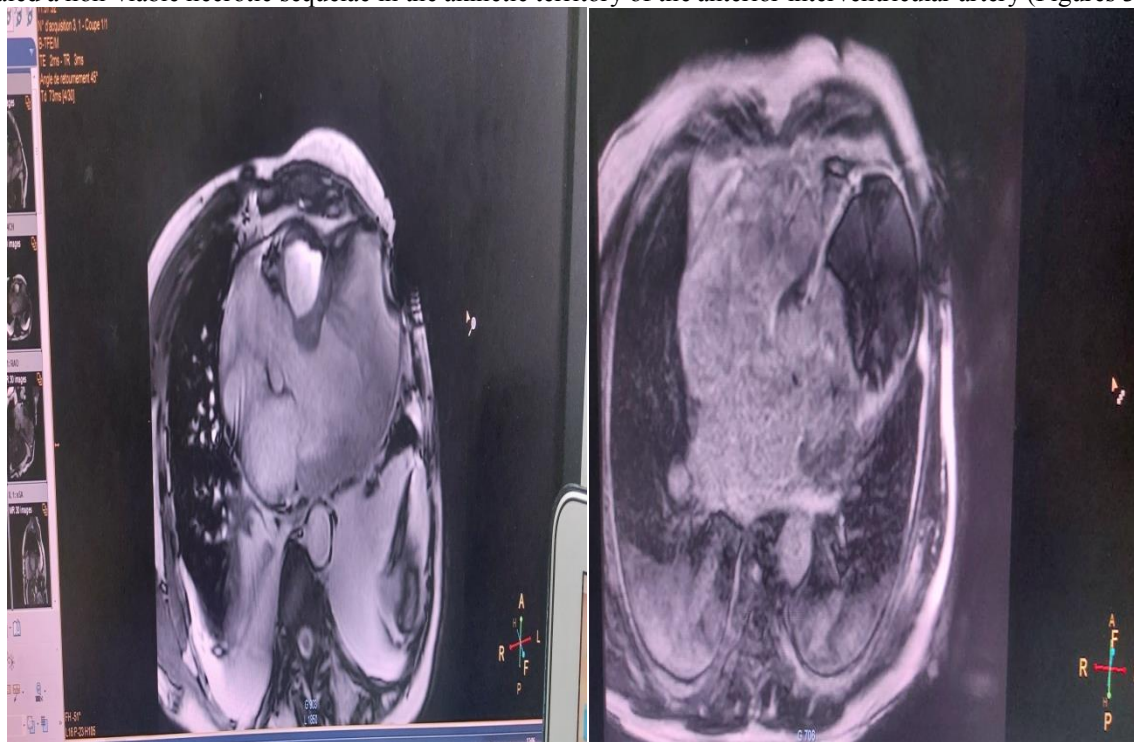


Figure 3 A

Figure 3 B

Figures 3 A and B: MRI images of the huge thrombosed aneurysm of the apex, measuring 64 x 53 mm.

The patient was admitted to the cardiac intensive care units. The heart failure flare was controlled and the patient was discharged on medical treatment for ischemic heart disease, diuretics, and anticoagulants. He was referred for cardiovascular and heart failure consultation with a close follow-up. The control transthoracic echocardiography at one month showed a decrease in the size of the thrombus (from 64 x 53 mm to 64 x 38 mm), and in the left ventricular ejection (from 38 to 35%).

### Discussion: -

Left ventricular (LV) aneurysm formation is a complication of transmural myocardial infarction (MI) that leads to a well-delineated outward bulging of the affected LV wall due to myocardial thinning and scar formation.<sup>2</sup> A left ventricular aneurysm is a segment of a left ventricular wall that protrudes from the expected diastolic outline of the ventricular chamber. The wall motion may be either akinetic or dyskinetic. The wall of the aneurysm is generally smooth without the usual trabecular pattern. Left ventricular aneurysms appear to develop early in the course of myocardial infarction. In more than 50% of patients who develop an aneurysm, it will be present within 24 to 48 hours of the onset of infarction and frequently will still be present 3 months later.

On imaging studies, a large scar or a small aneurysm may have the same appearance. A functional aneurysm has a normal diastolic contour but a dyskinetic systolic bulge in the region of a large acontractile segment and may contain either reversible ischemic myocardium or scar. In contrast, an anatomic aneurysm has an abnormal protrusion during both systole and diastole because the wall is entirely a scar that has stretched.<sup>3</sup>

Aneurysms more commonly complicate anterior than inferior infarction, often involving the apex.<sup>2</sup> It typically affects the anteroapical region of the LV, because the blood supply of the anterior wall is highly dependent on the anterior descending artery.<sup>4</sup> Risk factors for these aneurysms after acute MI include the following: Female sex, total occlusion of the left anterior descending (LAD) coronary artery, single-vessel coronary artery disease (CAD) and

the absence of previous angina pectoris. Clinically, ventricular aneurysms may be recognized late, with symptoms and signs of heart failure, recurrent ventricular arrhythmias, or recurrent embolization.<sup>5</sup>

In the current era of reperfusion therapy, a LV aneurysm is present in approximately 10% to 15% of patients with MI. Mechanically, the aneurysm does not contribute to LV ejection, but rather acts as a dead space for accommodating more blood in the LV cavity during systole and thereby compromising stroke volume. The presence of a poorly contracting, dilated left ventricle promotes stasis of blood and leads to an increased risk of thrombus formation. Demonstrating thrombus within the aneurysm is clinically important because such thrombi can lead to embolic complications. Results of studies differ widely, but both postmortem and surgical studies have demonstrated that approximately 50% of aneurysms contain a thrombus<sup>6</sup> and results from the inflammatory process in the endocardial region affected by the MI, being associated with the hypokinesia and hypercoagulability existing in the infarction, increasing the risk of a thromboembolic event after the third month in patients with ventricular aneurysm.<sup>4</sup>

An early diagnosis is mandatory to avoid life-threatening complications such as: heart failure, thromboembolism, or tachyarrhythmias. The benefits of surgical repair of left ventricular aneurysm have long been debated. Although a large amount of studies have showed that aneurysmectomy might improve the outcome<sup>7</sup>, the results from the STICH trial have questioned the benefit of this treatment.<sup>8</sup> Therefore, indication for aneurysmectomy depends on the decision of individual surgeons, and should be based on the assessment of the left ventricular dimensions, mitral valve regurgitation severity, extent of myocardial scar tissue and viability of the other regions of the left ventricle, and surgery should be performed in centers with a high surgical experience.

Surgical treatment of the LV aneurysms may be indicated in the setting of intractable heart failure or refractory ventricular arrhythmias. The aneurysm may be either resected and replaced with a Dacron graft or excluded by creating a partition between the normally functioning LV cavity walls and the aneurysm. Echocardiography may be helpful in determining the suitability for surgery and the approach used. In order for surgery to be feasible, the basal portions of the LV need to be normally functioning so that overall cardiac performance is preserved after surgery. Moreover, if the septum is involved in the aneurysmal dilatation, resection becomes less feasible and exclusion surgery may be the preferred choice.<sup>2</sup>

### **Conclusion:-**

Ventricular aneurysm is a serious complication of transmural myocardial infarction, being the most common mechanical complication and having a negative impact on quality of life. In the treatment of severe refractory cases, surgery is indicated, despite its controversial benefits.

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