Case Report

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2024.59.009369

# Cardiac Magnetic Resonance Imaging Findings of Post-Myocardial Infraction Related Giant Left Ventricular Aneurysm: Case Report

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**ARTICLE INFO**

**Received:** December 09, 2024

**Published:** January 02, 2025

**Citation:** Tuzcu G, Gök M. Cardiac Magnetic Resonance Imaging Findings of Post-Myocardial Infraction Related Giant Left Ventricular Aneurysm: Case Report. Biomed J Sci & Tech Res 59(5)-2024. BJSTR. MS.ID.009369.

**ABSTRACT**

**Objective:** Ventricular aneurysm is a significant complication that often develops after acute myocardial infarction (MI). More than 80% of left ventricular aneurysms (LVA) are in the anterolateral and apical segments, often associated with complete proximal occlusion of the left anterior descending artery (LAD) and inadequate collateral circulation. In this case report, we aimed to present cardiac magnetic resonance (CMR) imaging findings of 74-year-old male patient with post-MI giant left ventricular aneurysm.

**Case Presentation:** A 74-year-old male patient presented to our hospital with complaints of progressively worsening shortness of breath, fatigue, and chest pain over the past four months. Transthoracic echocardiography (TTE) revealed a large aneurysmatic area with significant wall motion limitation in the inferior wall of the left ventricle. To better assess the size, structure, and content of the aneurysm, CMR was performed. CMR findings revealed a large aneurysm (76x56mm), with thick walls in the inferior wall of the left ventricle. The content of the aneurysm showed a signal-free area compatible with thrombus and confirmed displacement of the myocardium with significant scar tissue on delayed contrast images with increased contrast uptake.

**Conclusion:** CMR imaging should be encouraged in the characterization of myocardial scar tissue after MI and in preventing complications such as ventricular aneurysms. This case highlights once again the importance of a multidisciplinary approach in the diagnosis and treatment of LVA.

**Keywords:** Aneurysm; Cardiac Magnetic Resonance Imaging; Myocardial Infraction; Scar

**Abbreviations:** LVA: Left Ventricular Aneurysm; MI: Myocardial Infarction; LAD: Left Anterior Descending; CMR: Cardiac Magnetic Resonance; TTE: Transthoracic Echocardiography; ECG: Electrocardiogram; LV-EF: Left ventricle Ejection Fraction

## Introduction

Left ventricular aneurysm (LVA) is a rare but serious clinical condition that usually develops after acute myocardial infarction (MI). The LVA is typically characterized by structural weakness in the left ventricular wall, often accompanied by the scarring of necrotic myocardial tissue following infarction. This pathology can lead to severe complications such as ventricular dysfunction, arrhythmias, thromboembolic events, and rarely rupture [1,2]. Epidemiological data show that LVAs are more commonly seen in patients who have experienced transmural MI. Advances in modern reperfusion strategies and invasive cardiological treatments, have significantly reduced the incidence of this pathology. However, when early diagnosis and appropriate treatment are not provided, LVA remains a significant cause of morbidity and mortality [3]. In recent years, cardiac magnetic resonance (CMR) imaging has been considered the gold standard in the diagnosis and assessment of LVAs. CMR offers a detailed examination of the aneurysm's anatomical structure, wall motion, and viable myocardial tissue [4]. Additionally, it provides tissue characterization to assess the size and distribution of scar tissue. These features play a critical role in the management of such cases [5]. This case presentation aims to highlight the CMR findings of a patient diagnosed with giant LVA after acute MI and discuss the clinical course and treatment approaches considering the literature.

## Case Report

A 74-year-old male patient presented to our hospital with complaints of progressively worsening shortness of breath, fatigue, and chest pain over the past four months. His medical history included an inferior MI 11 years ago and hypertension. On physical examination, his blood pressure was 160/90 mmHg, pulse was irregular and measured 84 beats per minute. The patient's electrocardiogram (ECG) showed pathological Q waves and T wave inversion in the inferior leads. Transthoracic echocardiography (TTE) revealed a giant aneurysmal area with significant motion restriction in the inferior wall of the left ventricle. To better evaluate the size, structure, and content of the aneurysm, CMR was performed. CMR findings revealed a giant aneurysm in the inferior wall of the left ventricle with a size of 76x56mm and thick walls (Figures 1 & 2). The content of the aneurysm showed a signal-free area compatible with thrombus, and the displacement of the myocardium with significant scar tissue was confirmed by increased contrast uptake on delayed contrast images (Figure 3). Right and left ventricular functions were assessed, and the left ventricular ejection fraction (LV-EF) was measured at 23%. Heart failure treatment had started. Patient was consulted to the Cardiovascular Surgery Department for surgery. However, due to high risk of mortality patient and his family did not consent for the surgery so medical treatment was the only option for the patient. During follow-up, although a good response to medical treatment was observed, due to age, comorbidities, and limitations regarding surgical treatment suitability, the multidisciplinary team recommended a palliative approach.

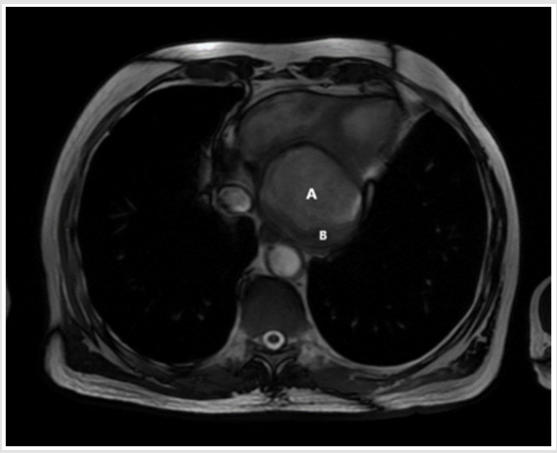


**Figure 1:**
(A) Axial plane T2 weighted image, left ventricle giant aneurysm.
(B) Organised thrombus in aneurysm related low signal intensity site.

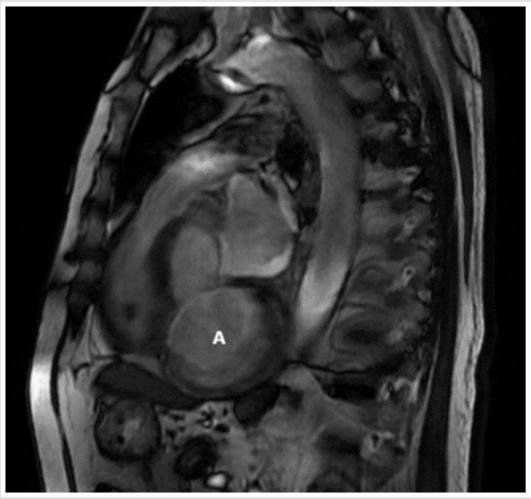


**Figure 2:** Sagital plane T2 weighted image, left ventricle giant aneurysm (A).

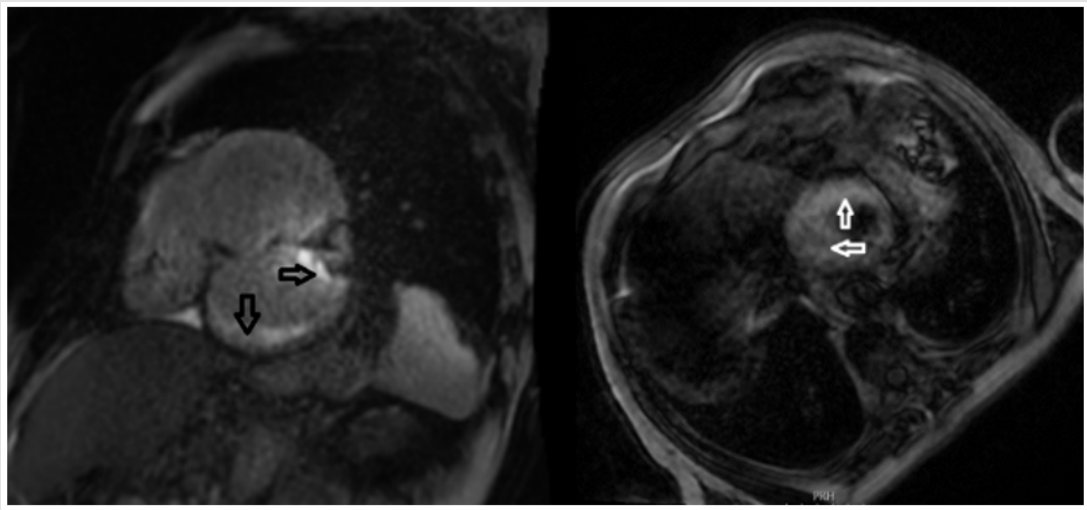

**Figure 3:** Increased contrast uptake of the aneurysm wall (arrows) in late contrast images.

## Discussion

Left ventricular aneurysm (LVA) is a serious complication that typically occurs after transmural MI. Despite modern reperfusion strategies and early treatment approaches, it remains an important issue that continues to affect clinical practice [6]. The pathophysiology of LVA is associated with infarction-induced necrosis and fibrosis processes that lead to permanent weakness in the ventricular wall. This condition increases the risk of complications such as left ventricular dysfunction, thromboembolic events, and arrhythmias [7]. In our case, this important pathology was assessed in more detail using CMR. CMR has emerged as an extremely sensitive method for detecting both left ventricular wall motion and myocardial scar tissue. The literature indicates that CMR plays a critical role, especially in evaluating viable myocardial tissue and guiding surgical decisions [8,9]. Regarding treatment, management of LVA depends on the clinical presentation and the risk of complications. In stable and asymptomatic patients, medical treatment is the first-line approach, while serious symptoms, rupture risk, or ventricular arrhythmias may require surgical intervention. Surgical approaches, such as aneurysmectomy or ventricular reconstruction, have the potential to improve the patient's prognosis [10]. However, these interventions carry a high risk of complications, so careful patient selection is crucial. In conclusion, this case highlights the critical role of modern diagnostic and treatment tools in the management of LVA. Furthermore, the broader use of CMR should be encouraged, especially in the characterization of myocardial scar tissue and the prevention of complications. Consistent with the findings in the literature, this case once again emphasizes the importance of a multidisciplinary approach in the diagnosis and treatment of LVA.

## Conflict of Interest

No conflict of interest.

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**ISSN: 2574-1241**

DOI: 10.26717/BJSTR.2024.59.009369

**Gök M.** Biomed J Sci & Tech Res