

## Left Ventricular Free-Wall Rupture (Pseudoaneurysm) after Acute Myocardial Infarction in an Asymptomatic Patient

*Ruptura de Parede Livre do Ventrículo Esquerdo (Pseudoaneurisma) pós-Infarto Agudo do Miocárdio em Paciente Assintomático*

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### Introduction

Left ventricular (LV) pseudoaneurysm after acute myocardial infarction may show nonspecific symptoms and be asymptomatic in up to 10% of cases. It demands investigation and a suspected diagnosis, with imaging methods playing a fundamental role in its diagnosis. This case report describes a pseudoaneurysm detected on a routine examination.

### Case report

Our patient was a 64-year-old man with a previous history of insulin-dependent type 2 diabetes, chronic kidney disease undergoing dialysis, and previous acute myocardial infarction during myocardial revascularization. The patient was asymptomatic from a cardiovascular point of view and was using optimized medications when he underwent routine transthoracic echocardiography to monitor ventricular function. Moderate ventricular dysfunction was observed on the transthoracic echocardiogram, with an image suggestive of LV wall rupture in the apical region, an opening of approximately 8 mm, and a pericardial collection contained by a probable thrombus (Figure 1). Cardiac magnetic resonance (CMR) used for diagnostic complementation revealed significant LV dilation with a LV ejection fraction of 38% with the loss of basal, septal, and apical lateral akinesia in the anteroseptal and inferolateral segments, and mid-basal hypokinesia of the anterolateral and inferolateral segments. Transmural delayed enhancement areas were observed in the anterior, anteroseptal, inferoseptal, inferolateral, and anterolateral mid-basal segments in addition to circumferential in the apical segments. CMR also confirmed an LV wall rupture with no delayed enhancement areas after gadolinium infusion and the presence of a thrombus measuring 4.4 × 2.6 × 2.4 mm, a finding compatible with a pseudoaneurysm (Figure 2, Video 1).

The patient underwent new catheterization, which showed severe coronary disease, vein graft occlusion, and previous left internal mammary artery graft to the anterior descending

artery (ADA) with good flow, no stenosis, but a distal ADA native bed occluded in the anastomosis.

The treatment of choice was invasive pseudoaneurysm correction and percutaneous occlusion with endoprosthesis (Amplatzer™).

Post-correction control computed tomography (CT) showed the Amplatzer™ prosthesis in the apical region with contrast extravasation through the lower apical region, delayed enhancement of the extracardiac collection (pseudoaneurysm measuring 71 × 60 × 30 mm), and delayed enhanced bleaching from the ventricular pseudoaneurysm (Figure 3).

The patient presented good clinical progression, remaining asymptomatic over the follow-up period.

### Discussion

LV pseudoaneurysm is a rupture of the myocardium that remains contained in the pericardium by a pericardial adhesion or scar tissue without the presence of myocardium in its composition.<sup>1,2</sup> It has varied and nonspecific clinical presentations, being asymptomatic in up to 10% of patients as in the case presented here, which can delay early diagnosis. Most pseudoaneurysms are diagnosed in the chronic phase months or years after rupture of the ventricular wall, remaining without diagnostic confirmation in the acute phase due to its rapid progression and unfavorable prognosis.<sup>3,4</sup> Pseudoaneurysms tend to grow rapidly and with a high risk of rupture, which can lead to pericardial tamponade and sudden death. The main cause of pseudoaneurysm is acute myocardial infarction; however, it may be less frequently a consequence of chest surgery, trauma, or infection.<sup>1,5</sup>

Echocardiography, CT, and CMR are effective noninvasive methods of diagnosing and guiding possible treatment. The imaging diagnosis depends on visualizing the discontinuity between the ventricular cavity and the myocardium. The presence of a narrow aneurysmal neck, smaller than the cavity, is also highly suggestive of pseudoaneurysm. CMR has higher spatial resolution, sensitivity, and specificity to confirm pseudoaneurysm. The absence of aneurysmatic sacculature enhancement and the presence of delayed pericardial enhancement using the delayed enhancement technique also corroborate this diagnosis.<sup>1,2,6,7</sup>

Due to a high risk of rupture, pseudoaneurysm correction is the treatment of choice in most cases.<sup>1,3</sup> More advanced surgical techniques reduce the risk of complications to less than 10%.<sup>3</sup> The conservative treatment may reach pseudoaneurysm rupture rates of 43%, but it can be considered in asymptomatic patients and with aneurysms smaller than 3 cm.<sup>1</sup> More recently, the use of percutaneous treatment using occlusive prostheses

### Keywords

Cardiac imaging techniques; Diagnostic imaging; False aneurysm.

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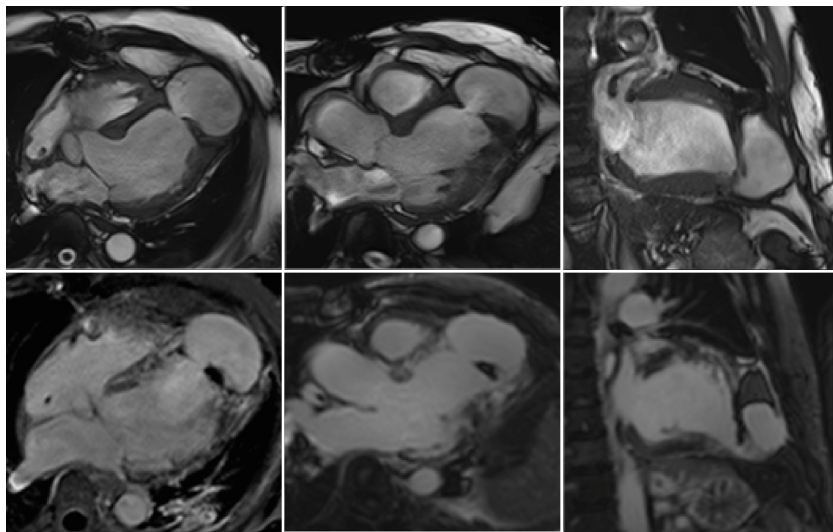
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## Case Report



**Figure 1** – Echocardiography image in apical four-chamber view showing an apical pseudoaneurysm.



**Figure 2** – Cardiac magnetic resonance imaging in long-axis sections showing an apical pseudoaneurysm. Delayed myocardial enhancement in the same sections showed areas of fibrosis without enhancement of the aneurysmal region (absence of myocardium).

as in the case described here, became an important option to treat this serious complication, showing good results, especially in narrow-neck aneurysms.<sup>1,8</sup>

### Final comments

The development of a LV free-wall pseudoaneurysm is a rare and severe condition occurring after myocardial infarction, with a nonspecific clinical presentation. It has a reasonable risk of rupture and may progress to cardiac tamponade and sudden death. The treatment of choice is generally invasive, with progressively decreased complication rates related to the procedure. In this case, an asymptomatic patient was diagnosed on a routine examination finding,

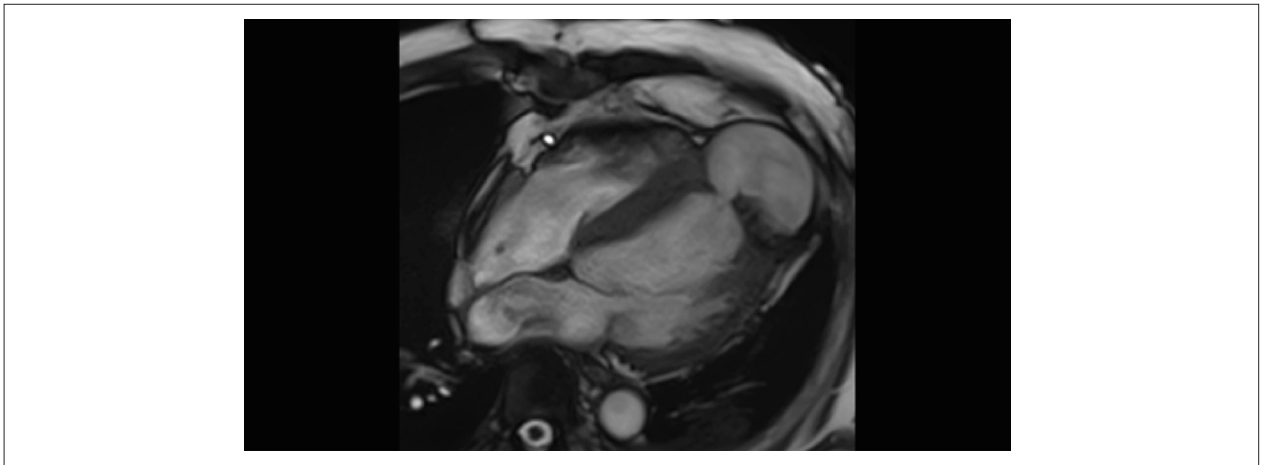
and treatment with an Amplatzer™ prosthesis showed a satisfactory result.

### Authors' contributions

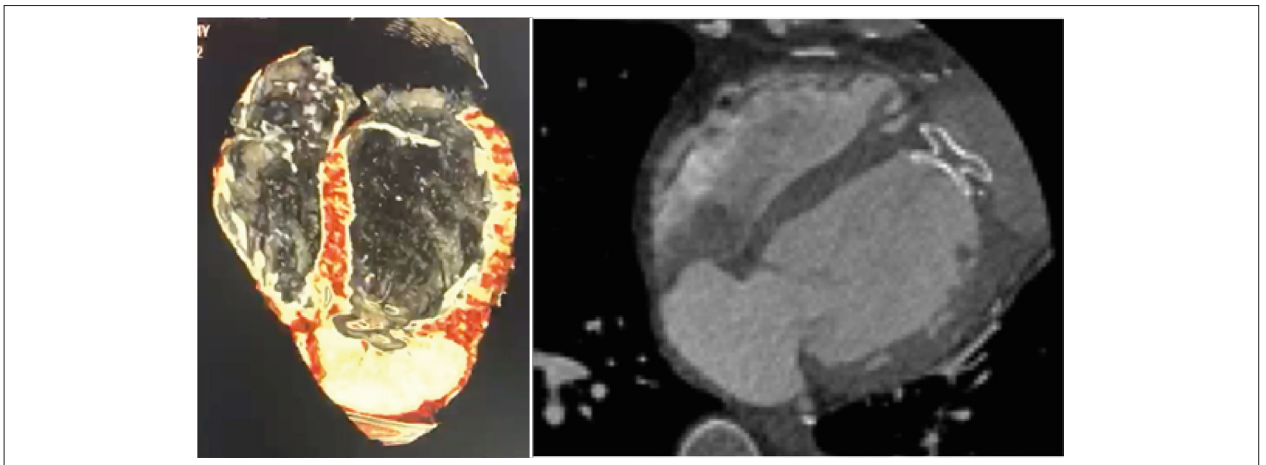
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### Conflict of interest

The authors have declared that they have no conflict of interest.



**Video 1** – Pseudoaneurysm in cine magnetic resonance imaging in longitudinal four-chamber section.



**Figure 3** – Computed tomograph showing pseudoaneurysm correction with an Amplatzer™ prosthesis.

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