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CASE REPORT

# Giant left ventricular pseudoaneurysm: The diagnostic contribution of different non-invasive imaging modalities☆

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**KEYWORDS**
Pseudoaneurysm;
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**Abstract** Distinguishing between zventricular aneurysm and pseudoaneurysm, although difficult, is of major importance due to the therapeutic and prognostic implications. The present case highlights the pivotal role of non-invasive imaging modalities for differential diagnosis between these entities in order to ensure appropriate management of these patients.


**PALAVRAS-CHAVE**
Pseudoaneurisma;
Ventrículo esquerdo;
Ecocardiografia;
Ressonância magnética cardíaca;
Cirurgia de reconstrução ventricular

**Pseudoaneurisma gigante do ventrículo esquerdo: contributo diagnóstico de diferentes modalidades de imagem não invasivas**

**Resumo** O diagnóstico diferencial entre o aneurisma e o pseudoaneurisma ventricular, embora difícil, é fundamental face às implicações terapêutica e prognóstica. O presente caso clínico realça o papel fulcral das técnicas de imagem não invasivas no diagnóstico diferencial destas entidades, possibilitando uma correta orientação dos doentes.


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## Introduction

The advent of early myocardial revascularization has led to a reduction in the incidence of mechanical complications after myocardial infarction (MI). Nevertheless, left ventricular (LV) free wall rupture, one of the most feared complications, occurs in 4% of MI patients, and is responsible for around a quarter of related deaths.[1] In rare cases, the rupture is contained by adherent pericardium, giving rise to a cavity delineated by scar tissue but with no muscle fibers, producing what has been termed a pseudoaneurysm; the risk of rupture is thus high[2] and urgent surgical repair is necessary. Given the prognostic and therapeutic implications, prompt diagnosis is essential. However, there are no features of clinical presentation, physical examination, chest X-ray or electrocardiogram (ECG) that are sensitive and specific to ventricular pseudoaneurysms as opposed to true aneurysms, which are a more common complication of MI. The present case illustrates these difficulties in diagnosis and highlights the role of imaging techniques in identifying this entity.[3]

## Case report

We report the case of a 72-year-old man, white, an ex-smoker, with a history of transurethral prostatectomy and cerebrovascular disease. He was not taking any cardiovascular medication. In February 2009, he suffered prolonged crushing chest pain radiating to the back accompanied by vomiting, but did not seek medical attention. He then began experiencing heart failure symptoms, with progressively worsening exertional dyspnea, but without recurrence of chest pain. Approximately one month later, he came to the emergency department of our hospital due to worsening symptoms, and was found to be in New York Heart Association (NYHA) class IV. The admission ECG showed signs of a previous anterior MI; no elevation of myocardial necrosis markers was observed. Echocardiographic assessment revealed severe LV systolic dysfunction, an apical aneurysm with intense auto-contrast (Figure 1) and a sessile thrombus; oral anticoagulation was therefore initiated.

Due to suspicion of pulmonary tuberculosis and marked deterioration in the patient's general condition, non-invasive stratification was the initial approach adopted. Further studies during hospitalization in the internal medicine department revealed no microbiological agent in bronchial secretions, gastric juice or blood cultures. There was a progressive fall in markers of systemic inflammation, obviating the need for empirical antibiotic therapy. The patient was discharged three weeks later, and referred for outpatient consultation. Some months later, he was rehospitalized for worsening heart failure.

The ECG showed signs of a previous MI (Figure 2) and the chest X-ray revealed a mass adjacent to the cardiac silhouette (Figure 3). Repeat echocardiography showed a large apical aneurysm, the image being compatible with a pseudoaneurysm, extending infero-posteriorly and compressing the right ventricle (Figure 4).

These findings prompted reversal of oral anticoagulation and suspension of antiplatelet therapy. Cardiac magnetic resonance imaging (CMRI) was performed to clarify the anatomy and aid the planning of surgical repair, which

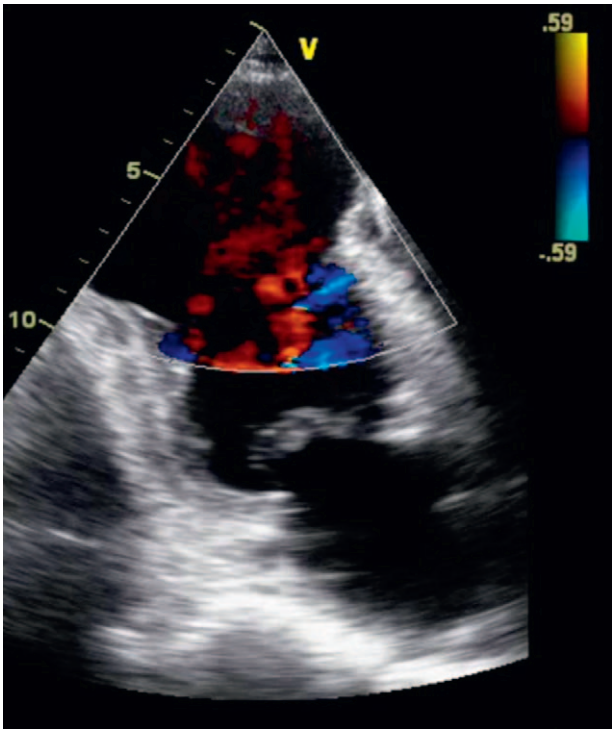


**Figure 1** Two-dimensional echocardiogram in diastole, apical 4-chamber view (left) and apical 2-chamber color Doppler (right), showing a wide-necked apical aneurysm with auto-contrast in the left ventricle.

confirmed the presence of a large pseudoaneurysm and showed its extension and close relation to the right ventricle, which was subject to significant compression. Delayed enhancement study was able to define the extent of the infarct and documented the presence of viable myocardium in the mid-basal segments of the left ventricle (Figure 5).

Following coronary angiography that showed occlusion of the mid segment of the anterior descending and 60% stenosis of the right coronary artery, the pseudoaneurysm was surgically resected, the LV aneurysm was excluded and the ventricle was reconstructed (Dor procedure) (Figure 6).

The patient's recovery was initially slow, but following discharge he has remained clinically stable, in NYHA class II. Repeat echocardiography three months after the surgical intervention showed normal LV dimensions, mildly impaired global systolic function, and a correctly positioned ventricular patch (Figure 7).

## Discussion

Mechanical complications after MI are now much less frequent following implementation of effective early revascularization strategies. Although infrequent, cardiac rupture is one of the most feared events since it is almost always fatal. In rare cases, the rupture may be contained by adherent pericardium or scar tissue, giving rise to a saccular formation with no myocardial fibers, which is termed a pseudoaneurysm. Given the composition of its wall, there is a high risk of expansion and rupture,[2] and urgent surgical repair is thus required. By contrast, a true aneurysm represents extreme maladaptive remodeling following an