

## Case Report

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# An unruptured “Pocket – Like” giant apical pseudoaneurysm of the left ventricle: A case report

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### Abstract

Cardiac pseudoaneurysm is rare and appears mostly as tardive complication of Acute Myocardial Infarct (AMI). Its apical localization is also scarce as it is usually described in posterior or lateral wall of left ventricle. Its diagnosis is based on cardiac imaging. We report a case of a hypertensive, diabetic and smoking 64-year-old man with a past history of anterior AMI. He was symptomatic of chest discomfort. Physical examination indicates an apical murmur, his electrocardiogram showed a regular sinus rhythm and a complete left branch block. The Transthoracic (TTE) echocardiography revealed a giant apical pocket-like aneurysm lined with a clot. Cardiac Magnetic Resonance Imaging (CMRI) confirmed the diagnosis of an apical pseudoaneurysm due to ischemic heart disease in the stage of severe heart failure.

### Introduction

Left ventricular pseudoaneurysm is a contained rupture of ventricular wall by adherent pericardium or scar tissue, it is a rare serious complication that occurs following Acute Myocardial Infarction (AMI) and may lead to sudden death, ventricular arrhythmias, pump failure, or thromboembolism. It is usually located in the inferior and posterior basal walls and rarely in the apex, in contrast a true aneurysm is mostly located in the apico-anterior wall. Distinction of a pseudoaneurysm from a true aneurysm can be difficult but characteristic imaging features are usually effective in reaching a definitive diagnosis. Surgical repair is associated with an important risk of complications.

### Case presentation

A 64-year-old diabetic hypertensive and smoking man presented to our hospital with chest pain at rest and frequent awakening due to chest discomfort at night for about 04 days. He had no palpitations, no syncope. There was no history of stroke or embolic event in the past.

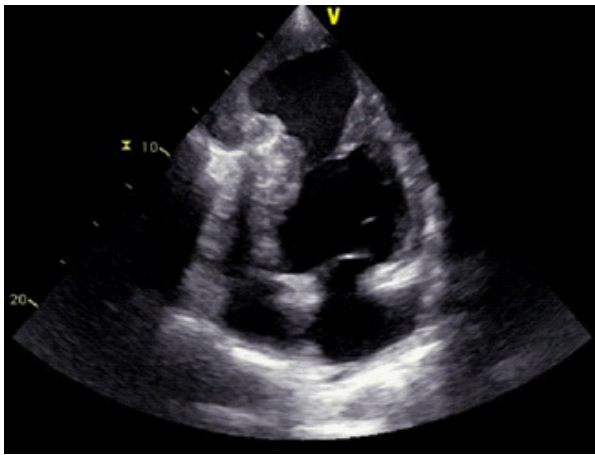
He revealed a history of anterior AMI 3 years ago. Percutaneous Coronary Intervention (PCI) was performed at that time for the occluded left anterior descending artery with a Bare Metal Stent (BMS). Post-PCI echocardiography showed moderately impaired left ventricular function (Ejection Fraction about 40%) with akinesia of the apex and apical walls.

Physical examination at the admission indicated blood pressure of 150/90 mmHg, heart rate of 80 beats/min, and a continuous murmur at apical area.

Electrocardiography (ECG) showed a complete left branch block.

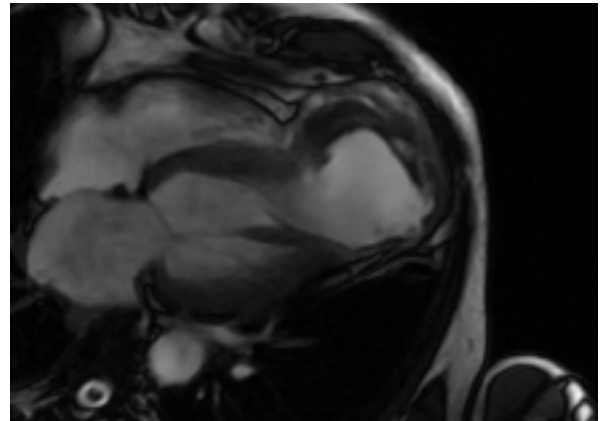
Transthoracic Echocardiography (TTE) showed a severe ventricular dysfunction with an ejection fraction less than 20%, a giant apical pocket-like aneurysm lined with a clot. There was minimal functional mitral insufficiency. The antero-lateral and infero-septal walls were hypokinetic. No pericardial effusion or right ventricular dysfunction were noted (Figure 1).

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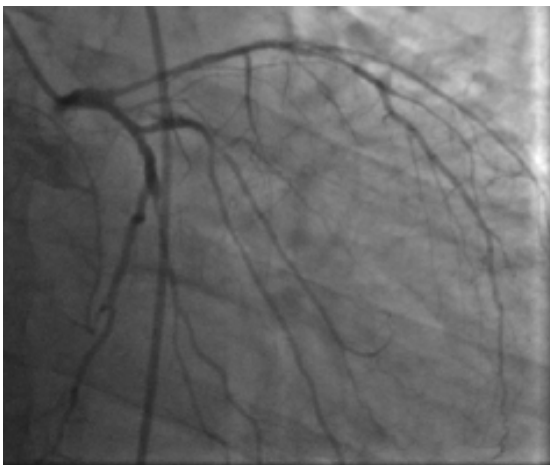


**Figure 1:** Transthoracic echocardiography: Apical four chamber view: Giant apical pocket-like aneurysm lined with a clot Urgent coronary angiography was performed: There was a three-vessel severe coronary artery disease. The Left Anterior Descending (LAD) presented a significant stenosis in proximal segment and an in-stent restenosis type 4 which seemed to be chronic (Rentrop II). The Left Circumflex Artery (LCX) and the Right Coronary Artery (RCA) were thin with angiographically significant coronary lesions on the second obtuse marginal artery and on right posterolateral branch (Figure 2,3).

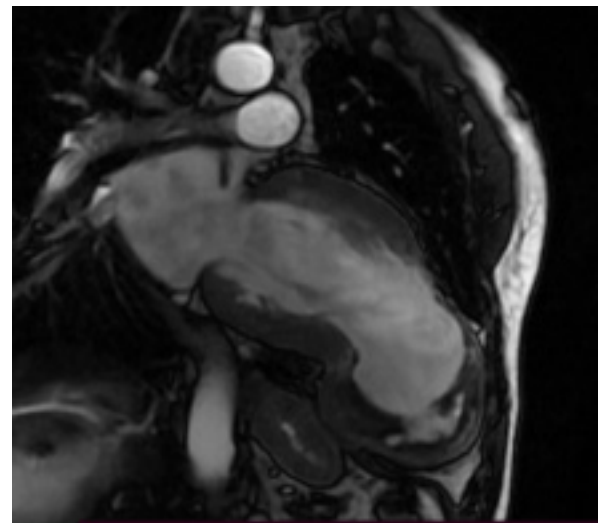
Cardiac Magnetic Resonance Imaging (CMRI) was performed to clarify the anatomy and aid the planning of surgical repair confirmed the presence of a large apical pseudoaneurysm (80 mm X 70 mm) of Left Ventricle (LV) and showed a clot which had a thickness about 30 mm. Ejection fraction was estimated by CMRI to be 18% when including the aneurysmal sac. No rupture signs were noted in this exam (Figure 4,5).



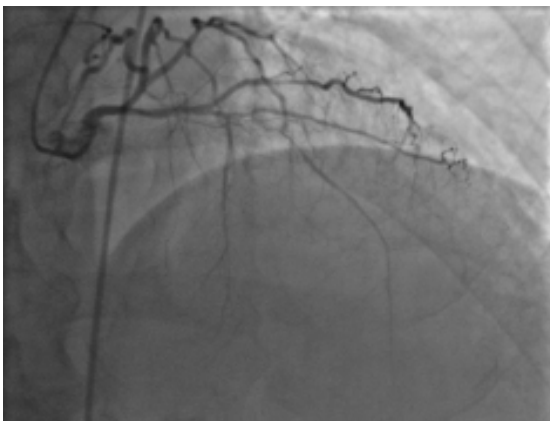
**Figure 4:** Cardiac magnetic resonance imaging: T2-weighted axial section: Cardiac aneurysmal sac.



**Figure 2:** TTE: long-axis parasternal in 2D mode.



**Figure 5:** Cardiac magnetic resonance imaging: T2-weighted sagittal section: large apical pseudoaneurysm lined by clot The patient refused to undergo surgical LV aneurysmectomy. He chose to be under optimal medical treatment of chronic heart failure anti-coagulation with acenocoumarol.



**Figure 3:** Coronary angiography: Left Anterior Oblique – cranial: Severe coronary artery disease.

### Discussion

Mechanical complications after MI are now much less frequent following implementation of effective early revascularization strategies.

Left ventricular pseudoaneurysm is a rare complication of acute myocardial infarction. It usually occurs with inferior and/or posterior infarction.

Postinfarction pseudoaneurysms, in contrast to true aneurysms, are much more likely to rupture, causing hemopericardium and death.

The highest risk of rupture exists within the first 10 days to 3 months (mean of 18 weeks) after infarction [1].

The signs and symptoms in the population at risk (history of MI, prior cardiac surgery) are neither sensitive nor specific for pseudoaneurysm.

Therefore, imaging is usually required to diagnose, to identify the presence of other pathology accounting for the patient's signs and symptoms, or to differentiate true LV aneurysm from pseudo-one which typically have a narrow neck in contrast [2].

Although angiography had historically been recommended as the imaging modality of choice for cardiac pseudoaneurysms, advances in non-invasive imaging during the past decade have improved the ability to accurately identify this condition [3].

The most accurate non-invasive diagnostic method has been echocardiography [4].

Initial evaluation with transthoracic echocardiography may be revealing but in suspected cases, angiography, and cardiac Magnetic Resonance Imaging (MRI) will have a higher diagnostic yield as coronary angiography shows the need for concomitant bypass grafting. CMRI has high spatial resolution and the ability to characterize tissue, thus enabling non-invasive identification of the pericardium and the presence of thrombi, and can distinguish between necrotic and normal myocardium, which is not always possible with other imaging modalities [5].

Besides providing information on overall morphology and function, particularly ventricular volumes and systolic and valve function, CMRI provides better morphological definition of a pseudoaneurysm's location, extension and its relations to adjacent structures. Moreover, delayed enhancement sequences enable accurate assessment of the location and extent of the infarcted area and of viable myocardium, thus contributing to pre-operative planning [6].

In view of its growing availability and advances in acquisition sequences, the technique is increasingly used in clinical practice, as in the case presented. It has added diagnostic value over echocardiography, particularly in patients with poor image quality, as well as to determine the relations of the pseudoaneurysm to the mitral valve and papillary muscles.

The myocardial infarction is the most common cause of left ventricular pseudoaneurysms, also prior aortic valvular surgery and endocarditis most often precede pseudoaneurysms at the mitral-aortic intervalvular fibrosa [3].

The reason for the detection of fewer anterior LV pseudoaneurysms may be due to the fact that an anterior LV wall rupture terminates in rapid hemopericardium, tamponade, shock, and death; whereas, posteriorly it tends to get contained by the pericardium and inflammatory adhesions forming a pseudoaneurysm rather than cardiac tamponade [7].

After diagnosis, no guidelines address whether to pursue follow-up imaging. For select patients managed non-surgically, follow-up imaging to assess for expansion may be reasonable if it could affect management [8].

In a series of 52 patients with ventricular pseudoaneurysm followed up for a median of 4 years, 42 patients underwent surgery, but notably 10 patients managed non-surgically did not have any occurrence of rupture [9].

A case similar to ours was recently published by Mohamed Farag and als. in February 2019 reporting an pseudo-aneurysm (constituted within 02 months post AMI) which was about 90mm treated surgically [10].

## Conclusion

As well the pseudoaneurysm as its apical location are rare. Although often challenging to diagnose, advances in noninvasive imaging (MRI and Echography) improve the ability to distinguish it.

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