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Case report

A case of a giant left ventricular pseudoaneurysm[☆]

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ABSTRACT

A Left ventricular pseudoaneurysm is an outpouching resulting from myocardial free wall rupture which is contained by an adherent pericardium or scar tissue. It most often occurs after transmural myocardial infarction, but may also follow cardiac operations, trauma, inflammation, or infection. In contrast to patients with true ventricular aneurysms, those with false aneurysms most commonly die of hemorrhage.

Transthoracic echocardiogram, computed tomography scan and cardiac MRI are currently the noninvasive modalities, whereas coronary arteriography and left ventriculography are invasive modalities used for diagnosis. As this condition is lethal, prompt diagnosis and timely management are vital.

We present a case report of a patient with no prior risk factors who presented for 1 year with palpitations during exercise and rest, as well as intermittent chest pain. A transthoracic echocardiogram was performed. Echocardiogram revealed an unexpected outpouching of the left ventricle. A computed tomography scan confirmed the diagnosis by revealing a massive left ventricle pseudomaneuvre. The patient was offered surgery, but he refused the procedure due to the surgical risk.

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Introduction

The Left ventricle pseudoaneurysm (LV PSA) is defined as an outpouching resulting from myocardial free wall rupture, which remains surrounded by the pericardium and adjacent scar tissue. The most common cause of this rare entity is the infarction of the myocardial tissue. Other causes include cardiac infection, cardiac surgery, and trauma [1].

There are 3 types of cardiac ventricle outpouchings: diverticula, aneurysm, and pseudoaneurysm. While all types may be asymptomatic, patients can present with palpitations, arrhythmia, chest pain, dyspnea, and rarely, sudden death from rupture [2,3]. The main differences between these types are their contractility and the extent of the involvement of the cardiac wall. These characteristics also influence the appearance of the image. Cardiac diverticula and aneurysms both contain all 3 layers of the cardiac wall and may be distinguished by their contractility simultaneous with the rest of the ventricle, unlike pseudoaneurysm [2].

Case presentation

We report the case of a 30-year-old patient without any previous history and without any cardiovascular risk factors. He had been experiencing palpitations during exercise and at rest for a year, along with intermittent chest pain.

The evolution was marked by the appearance of dyspnea stage III of NYHA, which motivated his consultation in the emergency department of the Hassan II University Hospital of Fez.

The clinical examination revealed a conscious patient who was hemodynamically and respiratory stable, with blood pressures of 135/85 mm Hg in both arms, a heart rate of 70 beats

per minute, peripheral pulses that were present and symmetrical, and cardiac auscultation that was normal.

ECG objectified: regular sinus rhythm, left heart axis, incomplete left bundle branch block and negative T wave.

The transthoracic echocardiogram showed a dilated LV with preserved systolic function and homogeneous contractility, restrictive mitral flow, non-dilated right chambers, dry pericardium, and a false aneurysm of the apical wall of the LV.

A chest CT angiography was requested urgently and showed a parietal rupture at the level of the LV apex with individualization of a large pseudoaneurysm limited by the pericardium and reaching the level of the left diaphragmatic dome. It measured 103 × 47 × 74 mm with a wide neck of 8 mm (Fig. 1).

The patient was initiated on medical therapy with angiotensin-converting enzyme inhibitors as afterload reduction therapy and β -blockers as an antianginal medication. The definitive surgical treatment was recommended and discussed with the patient. However, he refused the procedure.

Discussion

A cardiac pseudoaneurysm is defined as a rupture of the myocardium that remains contained by pericardial adhesions [4]. It usually represents a rare complication of myocardial infarction, but it may also occur after cardiac surgery, chest trauma, and endocarditis. Pathologic examination shows fibrous tissue and a lack of the myocardial elements that are usually seen in the wall of a true aneurysm [5].

It is traditionally believed that a pseudoaneurysm has a high risk of rupture even several years after its formation [6].

The clinical presentation of patients with LV pseudoaneurysm is not specific and can mimic myocardial infarction or heart failure. Indeed, patients could be asymptomatic (12%) or could have persistent or recurrent chest pain (30%), short-

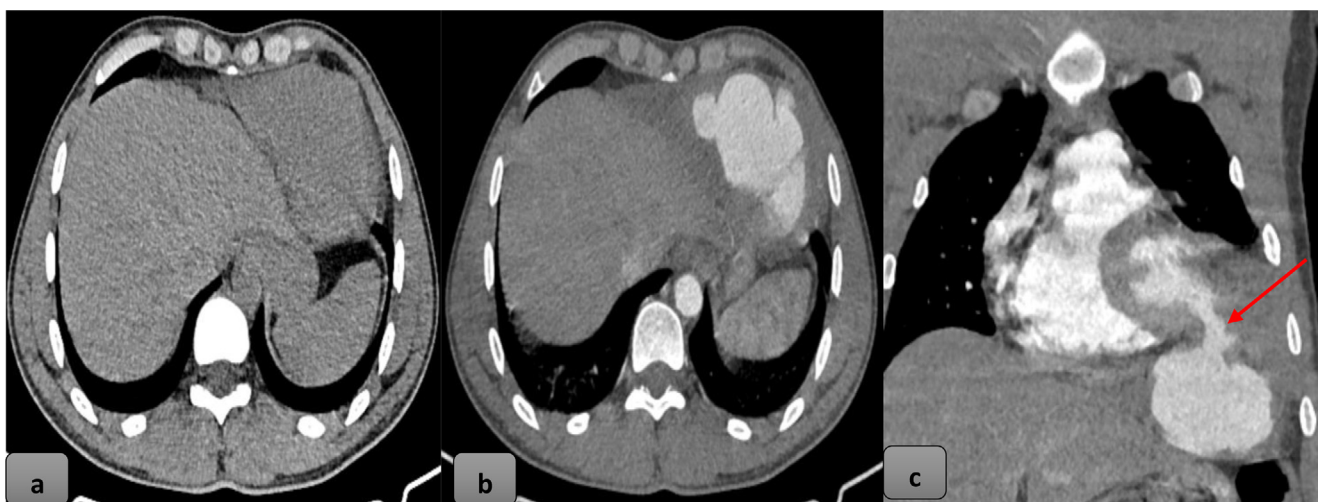


Fig. 1 – Axial (A, B) and coronal (C) chest CT angiography showing a parietal rupture at the level of the LV apex (arrow) with individualization of a large pseudoaneurysm limited by the pericardium and reaching the level of the left diaphragmatic dome.

ness of breath (25%) or non-specific symptoms like dizziness or altered mental status, and 3% of the patients could have sudden death as a presenting symptom [7].

Various imaging modalities have been used to assess LV PSA. Historically, angiography was considered the modality of choice. However, currently, noninvasive techniques are preferred in most cases. Thus, on chest radiographs, a mass or abnormal contour of the heart may be seen, although the most common finding reported is simply heart enlargement [8]. Peripheral calcification of the pseudoaneurysm sac may be identified at later stages. In transthoracic echocardiography, LVA PSA is usually presented as a focal outpouching with a narrow neck connecting the saccular pseudoaneurysm to the ventricular cavity. Color Doppler may aid in diagnosis by depicting aliasing and to-and-fro flow through the neck of the pseudo-aneurysm. Pericardial effusion with varying degrees of echogenicity may also be discovered [9–11].

Computed tomography (CT) provides excellent spatial resolution with accurate identification and morphologic assessment of the pseudoaneurysm sac and neck. Additional findings may include pericardial effusion with variable attenuation values. In our patient, the CT angiography showed a parietal rupture at the level of the LV apex with individualization of a large false aneurysm, limited by the pericardium and reaching the level of the left diaphragmatic dome with no pericardial effusion, with no other abnormalities. These features are similar to those described in the literature.

On the other hand, abnormalities of the thoracic parenchyma characteristic of heart failure and possible thromboembolic events can be detected.

Cardiac MR imaging is a valuable non-invasive technique that allows anatomic and functional characterization of the left ventricle. Cardiac MR also presents an advantage in the assessment of thrombus, a commonly encountered complication of LV PSAs [1].

Regardless of the imaging modality, several features can help distinguish the different types of ventricular outpouchings. Motion of the outpouching wall during systole is the most helpful. Ventricular diverticula contract with the unaffected cardiac wall, true aneurysms are hypokinetic or akinetic, and pseudoaneurysms paradoxically balloon outwards as ventricular pressure increases during contraction. The size of the neck of the outpouching can also help distinguish pseudoaneurysms from other outpouchings. The initial defect in the cardiac wall leading to pseudoaneurysm formation is almost always small, as larger ruptures are typically lethal. While the outpouching of a pseudoaneurysm expands under pressure from the ventricle, its neck size is fixed by the surrounding intact myocardium [12].

Surgical repair can relieve symptoms unresponsive to more conservative therapies or be included in the repair of larger malformations in children. However, with the risk of rupture estimated to be 1.2% per year, the risks of prophylactic surgery should be carefully weighed in otherwise healthy patients.

The benefits of surgery outweigh the risks of rupture in almost all cases. Previous studies suggest that conservative management can be considered in asymptomatic patients with small aneurysms (less than 3 cm in dimension) or increased surgical risk [1]. In our case, the patient was of-

fered surgical treatment, but he declined due to the surgical risk.

Conclusion

In conclusion, ventricular outpouchings are uncommon. The diagnosis of pseudoaneurysm should be suspected in patients who present with congestive heart failure, recurrent angina, cardiogenic shock, or thromboembolism following a transmural myocardial infarction. Early diagnosis may be suggested by doppler echocardiography and confirmed by a chest CT scan. Active surgical management of an LVP with patch closure or primary closure is a highly recommended first choice, especially in patients with the symptomatic and acute disease.

Patient consent

The patient first was discharged against medical advice, then was reported deceased by the family.

We tried to reach the family for a consent statement but there was no further answer.

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