



Distal Embolism Secondary to a Ventricular Pseudoaneurysm Associated an Abdominal Aortic Aneurysm

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Abstract

Acquired pseudoaneurysm of the left ventricle is a rare disorder that usually occurs after myocardial infarction (MI) or after cardiac surgery. Rupture of the free wall of the left ventricle due to myocardial infarction (MI) occurs in almost 4% of patients with infarcts and in 23% of those dying of myocardial infarction. Left ventricular pseudoaneurysms are often asymptomatic and are discovered incidentally upon investigation of some other condition. It is extremely infrequent that their diagnosis is carried out as a result of a distal embolization in the lower extremities, as presented in the following clinical case.

Introduction

Regardless of treatment strategy, left ventricle pseudoaneurysms are associated with a high mortality rate. We report on the extremely rare occurrence of a patient presenting one episode of distal embolism in the lower extremities associated with giant post-infarction left ventricular pseudoaneurysm and abdominal aortic aneurysm [1-3]. The key to success in this case is related with the diagnosis of an undiagnosed ventricular pseudoaneurysm following acute myocardial infarction and masked by a possible embolic origin of the abdominal aortic aneurysm [4,5].

Case Presentation

A 72-year-old patient was admitted in the Vascular Surgery Department on July 20th, 2016, after consulting at the emergency department for presenting atheroembolic lesions on the toes of both feet associated with resting pain in both lower extremities (Figure 1).

The patient had no known drug allergies, had stopped smoking three months ago, and had had an acute non-Q myocardial infarction in March 2016, requiring endovascular treatment with a stent implantation on the right circumflex and obtuse marginal coronary arteries, although there was no possibility to revascularize the anterior descending artery by chronic obstruction with a sequela of paroxysmal atrial fibrillation post infarction. On physical examination, cardiac auscultation was rhythmic, with no murmurs, and pulmonary auscultation presented a preserved vesicular murmur. In the lower limbs no edema was observed, and the femoral, popliteal and distal pulses were preserved in both lower extremities with cyanotic lesions on both feet.

On the electrocardiogram, the rhythm was sinus, at 55 bpm, axis -30°, PR 160 msec, QRS 100 msec, negative T waves in II, III, aVF, aVR, V4 to V6, Q waves in III, aVR, aVF. The chest X-ray showed a cardiomegaly and pulmonary hyperinflation. On the duplex-scan, the infrarenal abdominal aorta had a maximum diameter of 4 cm; the right common iliac artery had an aneurysm of 3.1 cm maximum diameter, the left common iliac artery 2.5 cm. And both external iliac arteries were ectasic but not aneurysmal. At the level of the lower extremities, the right common femoral artery had a maximum diameter of 2.4 cm, a right popliteal artery of 1.3 cm, the left common femoral artery of 1.1 cm in diameter and a left popliteal artery of 1.6 cm maximum diameter.

Subsequently, a computerized axial tomography was performed in which an aneurysm was seen in the lower face of the left ventricle with dimensions of approximately 6.9 cm x 7.3 cm x 4.8 cm in its transverse, antero-posterior and cranial-caudal diameters, respectively (Figure 2). The abdominal aorta presented an aneurysmal dilatation of approximately 4.2 cm x 4.5 cm in its transverse and antero-posterior diameters and iliac aneurysms with maximal diameter of the right common iliac aneurysm of 2.9 cm and 2.5 cm in the left common iliac artery.

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Figure 1: Shows the atheroembolic lesions in the leg.



Figure 2: Shows left ventricular pseudoaneurysm.

A transthoracic echocardiogram was completed in which there was dilation of left cavities with normal dimensions of the right heart cavities. A large basal inferior pseudoaneurysm was observed with a 45 mm neck and a depth of 46 mm with diastolic expansion that originated from the mitral annulus to the insertion of the posteromedial papillary muscle. The systolic function was moderately depressed (39%). Diastolic function presented severe alteration of relaxation. The aortic valve was trivalva with moderate stenosis. Thrombotic material was observed inside of pseudoaneurysm.

The supra-aortic arteries duplex-scan showed a stenosis of 70% at internal carotid artery and a peak-systolic velocity of 170 cm/s.

Finally, cardiac scintigraphy showed the anterior descending artery chronically occluded at the mean level revascularizing a distal level by homo coronal collateral, circumflex artery without intra stent stenosis, right coronary artery chronically occluded at the mean level revascularizing a distal level by homo and hetero coronary collateral.

With the diagnosis of giant inferobasal pseudoaneurysm of the left ventricle, moderate aortic valve stenosis and ischemic heart disease with a single revascularisable vessel, the patient underwent Surgery on the ninth day of entry.

In the surgical intervention we observed severe pericardial adhesions at the apex, lower and posterior ventricular left side, mild to moderate left ventricular dysfunction, severe dilatation of the cardiac cavities, and horizontality of the heart and the presence of left ventricular pseudoaneurysm from the proximity of the mitral annulus to the basal and posterior middle segments. Surgical repair consisted of ventricular reconstruction using endoaneurismorrhaphy with bovine pericardial patch attached to Teflon patch anchored by simple and Teflon-supported points on the healthy muscular zone of the left ventricular wall, in intimate relation with papillary



Figure 3: Shows the infrarenal aortic aneurysm and the endovascular postoperative control.

muscles and tendinous cords. In addition, a sandwich fold of the pseudoaneurysm wall was performed on the patch, supported on two Teflon strips. Subsequently, the aortic valve was replaced by Perimount Magna prosthesis n°23 supraannular and surgical myocardial revascularization by internal mammary artery bypass to the anterior descending artery. After the intervention, the patient was admitted to the cardiac reanimation unit. A new echocardiogram revealed a hematoma that compressed the right atrium causing cardiac tamponade that required surgical reintervention. In the postoperative period, he required pharmacological support with noradrenaline, dobutamine, and polytransfusion. The patient was extubated on the Fourth postoperative day.

Twenty days later, the patient underwent a third surgical intervention for endovascular repair of infrarenal aortic and right common iliac artery aneurysms with a bilateral aortoiliac endoprosthesis and embolization of the aneurysmal sac with coils (Figure 3). The patient also required bilateral transmetatarsal amputation.

At the time of discharge, the echocardiogram the mitral valve with central insufficiency. The prosthetic aortic valve was normal functioning. The ventricular ejection function was 55%. The right ventricle had preserved its dynamic (TAPSE 20mm). The patient was discharged with oral anticoagulation therapy, antiaggregation with clopidogrel 75 mg in addition to his usual treatment.

Comment

Left ventricular pseudoaneurysms are characterized by a small, narrow necked that links the ventricle with an aneurysmal sac, which contains thrombus and blood and is surrounded by fibrous pericardial tissue without myocardial tissue [5].

Left ventricular pseudoaneurysms are often asymptomatic and are diagnosed in the context of another concomitant pathology, usually cardiologic, such as congestive heart failure or ischemic heart disease. Diagnosis can be made preoperatively by several imaging techniques, including computed tomography, echocardiography, and magnetic resonance imaging; however, contrast ventriculography and coronary angiography seem to be necessary in evaluating the location and anatomy of the aneurysm and the state of the coronary arteries. The differential diagnosis between pseudoaneurysm and a true aneurysm is difficult, although the presence of a narrow neck in color flow Doppler echocardiography or ventriculography suggests the existence of a pseudoaneurysm. The natural history of left ventricular

pseudoaneurysm is not well known given its low frequency [6].

In conclusion, regardless of treatment strategy, left ventricle pseudoaneurysms are associated with a high mortality rate. The key to success in this case is related with the diagnosis of an undiagnosed ventricular pseudoaneurysm following acute myocardial infarction and masked by a possible embolic origin of the abdominal aortic aneurysm.

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