Left Ventricular Pseudo-Aneurysm: Do Not Make the Same Mistake

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Abstract

The differentiation between left ventricular pseudo-aneurysm and true aneurysm is sometimes difficult and there are some pitfalls in the process of making the right diagnosis. Correct diagnosis has considerable effect on the outcome and management of the patients. We report the case of 59-year-old man who referred to the emergency department with complaints of lower extremity edema and dyspnea on exertion. In his past medical history, he had been diagnosed with post-myocardial infarction and apical true aneurysm four months before his arrival at the emergency ward. The patient was under strict medical follow-up for his condition. Echocardiography was conducted in the emergency ward, and it revealed a huge apical pseudo-aneurysm, which had been miss-diagnosed in the past echocardiographic examination. We herein seek to address this issue and underscore the pitfalls in making the correct and necessary distinction between these two not so uncommon entities. ***(Iranian Heart Journal 2012; 13(3):39-42) .***

Case Presentation

A 59-year-old man presented to the emergency department with complaints of dyspnea and lower extremity edema associated with exercise intolerance. His blood pressure was 90 over 60 mmHg with a pulse rate of 110 beats per minute. In cardiac auscultation, he had left-sided S3 with soft S1without any murmur. Bilateral diffused fine rale could be heard in the lung fields. Four months previously, the patient had been admitted to the hospital due to anterior wall ST-segment elevated myocardial infarction and been discharged with recommendation for strict medical follow-up after coronary angiography with non-significant proximal left anterior descending coronary artery lesion and transthoracic echocardiography that showed an ejection fraction of 15% with an apical aneurysm. In the emergency room, transthoracic echocardiography demonstrated an ejection fraction of 15% associated with a huge apical pseudo-aneurysm, which had been mistaken for a true aneurysm in the previous study (Figures 1& 2). The valvular structures were normal. After the insertion of an intra-aortic balloon pump, the patient was operated on, but almost all the left ventricular wall was necrotic tissue. He subsequently died in the operating room due to pump failure.

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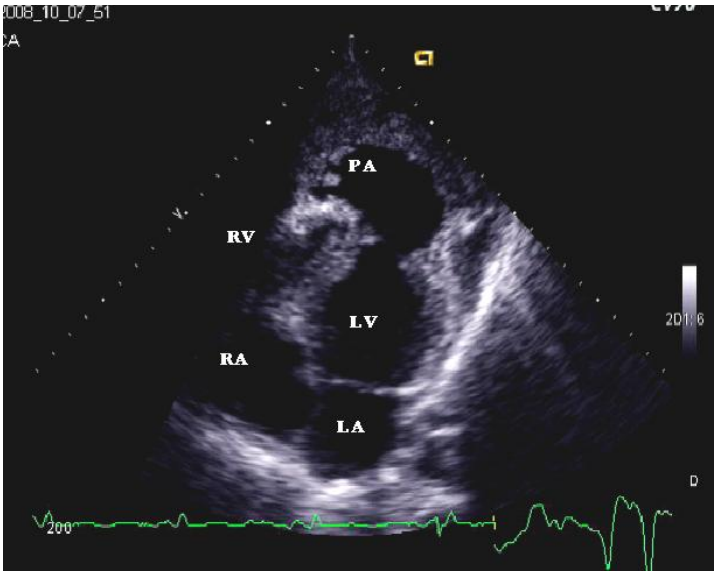

Figure 1- Transthoracic echocardiography of a 59-year-old man, who presented to the emergency department with dyspnea and lower extremity edema, in the four-chamber view. Huge apical pseudo-aneurysm of the left ventricle filled with thrombosis is evident. LA: left atrium, LV: left ventricle, PA: pseudo-aneurysm, RA: right atrium, RV: right ventricle.

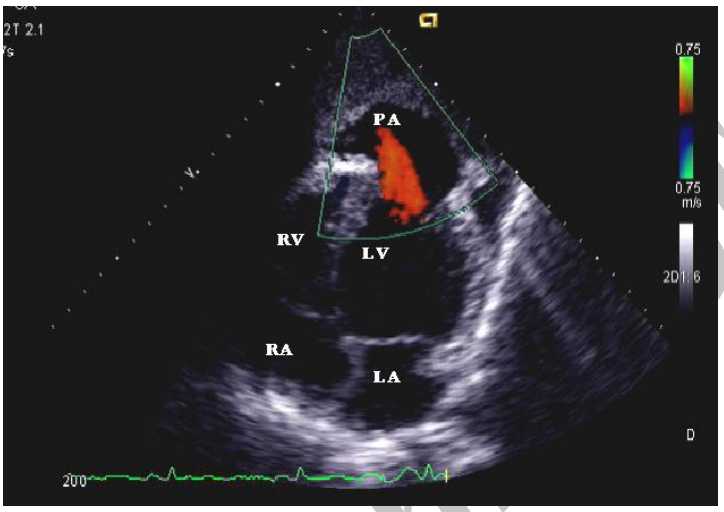

Figure 2- Transthoracic echocardiography of a 59-year-old man, who presented to the emergency department with dyspnea and lower extremity edema, in the four-chamber view with color Doppler. Huge apical pseudo-aneurysm of the left ventricle filled with thrombosis with communication to the left ventricle is evident. LA: left atrium, LV: left ventricle, PA: pseudo-aneurysm, RA: right atrium, RV: right ventricle.

Discussion

Rupture of the cardiac wall is usually a fatal complicationof acute myocardial infarction within the first two weeks. However,in certain cases, a ruptured ventricular wall and the hematoma dissecting into a transmural infarct is contained bythe overlying adherent pericardium and clot, called a pseudo-aneurysm. In contrast, a true aneurysm is caused by scar formation usually after anterior transmural myocardial infarction and thinning of the myocardium [1,2].

False aneurysms of the left ventricle are unusual and are distinctly different from the more common true aneurysms. Pseudo-aneurysms communicate with the left ventricle through a smaller orifice comparing with true ones and their wall consists of pericardium and mural thrombus and lack identifiable epicardial or myocardial elements [2].

The differentiation of left ventricular pseudo-aneurysm from true aneurysm is sometimes difficult. Unlike true aneurysms, which have a benign course, pseudo-aneurysms have a propensity to rupture, leading to cardiac tamponade, shock, and death. Consequently, it is therapeutically important to diagnose them from each other. Clinical symptoms, physical examination findings, and electrocardiograms cannot differentiate them, and this also is the case for routine X-rays, which are neither sensitive nor specific [3]. Because of the propensity of the false aneurysm to rupture, early

diagnosis and aggressive surgical treatment is recommended [4].

Some small studies have shown that marked delayed enhancement of the pericardium is a characteristic feature of the false aneurysm and cardiac MR can be a very useful toolin this regard. Cardiac MR can play a very important role in cases which are difficult or impossible to diagnose via echocardiography or left ventricular angiography[5][6].

The most important and difficult finding in echocardiography is the detection (or not) of continuity in the myocardium. A pseudo-aneurysm is in fact a rupture, so discontinuity is expected in the myocardium. On the other hand, an aneurysm is a thin myocardium bulging, with outside blood loss. Blood clots, when present, can render this distinction very hard. (7) In true aneurysms, we expect to face a wide base, walls composed of myocardium, and low risk of rupture. In comparison, in pseudo-aneurysms, we encounter a narrower base, walls composed of thrombus and pericardium, and high risk of rupture. Distinctive features of these entities are shown in Table 1. Differentiation between aneurysms and pseudo-aneurysms is important in diagnosis and for correct therapy (8).

Surgical therapy in pseudo-aneurysms is done to ameliorate the ischemia by coronary artery bypass grafting surgery (CABG), reduction in the left ventricular volume, and if possible restoration of the left ventricular geometry as much as possible simultaneously with the correction of mitral regurgitation. Nonetheless, the surgical approach for true aneurysms has a different agenda: it is done to abort, prevent, and reverse remodeling, diminish heart failure, and most importantly improve survival. (7)

Table 1 .Differences between aneurysms and pseudo-aneurysms.

	Aneurysms	Pseudo-aneurysms
Location	posterior	Posterior or inferior
Echocardiography AnatomyThinned myocardium Contractility	 Non-contractile	Ruptures Dyskinesia
Consequences/Complications	Congestive heart failure Embolic events Ventricular arrhythmias	Congestive heart failure Embolic events Ventricular arrhythmias
Therapy	Medical or Surgical therapy	Surgery
Surgical risk	Dubious	Lower than medical therapy

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