Giant Left Ventricular Pseudoaneurysm Two Years after Blunt Chest Trauma

Abstract

Left ventricular pseudoaneurysm is an extremely rare condition. Here we present a case of a giant left ventricular pseudoaneurysm that developed 2 years after a blunt chest trauma. The patient presented with shortness of breath during exercise. The diagnosis was initially made using chest X-ray and then it was confirmed with echocardiography and computed tomography. The patient underwent successful surgery.

Keywords: Left ventricular pseudoaneurysm; Blunt chest trauma.

Case Report

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Stepan S Babeshko, Vasily I Kaleda* and Kirill O Barbukhatty

Department for Adult Cardiac Surgery, Ochapowski Regional Hospital, Russia

***Corresponding author:** Vasily I Kaleda, Department for Adult Cardiac Surgery, Ochapowski Regional Hospital, #1, Krasnodar, 350086, Russia, Tel: +791-826-001-19, Email: vasily.kaleda@gmail.com

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Introduction

Pseudoaneurysm of the left ventricle (LV) is an extremely rare condition and in fact is a favorable outcome of usually fatal rupture of the LV. The most frequent cause of LV pseudoaneurysm is an acute myocardial infarction [1]. Other causes include trauma, cardiac surgery (usually mitral valve replacement) and infection [2]. Blunt chest trauma is a cause of nearly 2% out of all LV pseudoaneurysms [1,3]. Here we present a rare case of a giant LV pseudoaneurysm that developed 2 years after a blunt chest trauma.

Case report

A 43-year-old male patient was presented to our clinic with shortness of breath during exercise. Two weeks prior the admission he had an episode of severe weakness after intensive physical activity with a sudden drop of arterial blood pressure to 80/40 mmHg. Two years previously the patient suffered a blunt chest trauma after a flat fall on an electric hammer from a height of about one meter. Until recently, he was asymptomatic.

The physical examination revealed a mild systolic murmur at the cardiac apex. Chest X-ray showed a large (90x70 mm) shadow in the left thoracic cavity above the diaphragm. This shadow was closely adjoined to the left cardiac contour. ECG recorded sinus tachycardia with reduced voltage and abnormal QS complexes in leads V_4-V_5. Echocardiography revealed a multi-chamber LV pseudoaneurysm with total volume of about 770 ml. A wide neck (37 mm in diameter) of the aneurysm was seen at the LV apex. The aneurysmal cavity was filled with multiple shadows (blood clots?). Mild mitral regurgitation (++) was registered. Computed tomography confirmed the diagnosis of giant multi-chamber LV pseudoaneurysm of 123x123x110 mm in size (Figure 1). The operation was performed through a complete median sternotomy. About 400 ml of bloody fluid was removed from the pericardial cavity. Standard aortic and right atrial cannulations were done and extracorporeal circulation initiated. The apex of the heart and diaphragmatic surface of the LV had strong adhesions to surrounding tissues. After aortic cross-clamping and induction of antegrade cardioplegia, the adhesions were dissected and the cavity of the aneurysm was opened. It contained multiple small chambers with numerous partially organized blood clots. Aneurysm was excised together with the parts of left mediastinal pleura and pericardium. The neck of the aneurysm appeared as a large round opening bordered by dense scar tissue (Figure 2a). It was closed with a Dacron (10x20 mm) patch using a running polypropylene 2/0 suture (Figure 2b). The residual aneurysmal walls were sutured together above the patch in 2 layers with polypropylene 0/0 suture (Figure 2C). Intraoperative TEE revealed left ventricular end diastolic volume of 110 ml. The mitral regurgitation decreased (to+). The postoperative period was uneventful. The patient was discharged on the 7th day PO in a satisfactory condition.

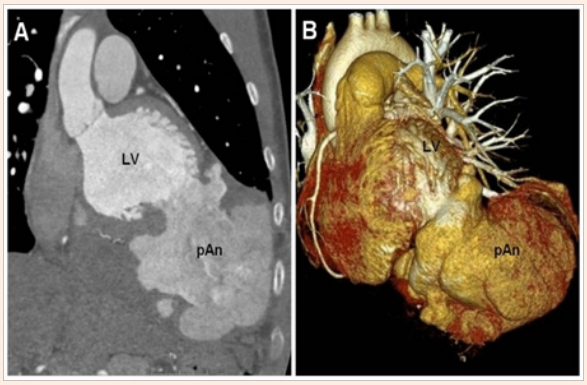

Figure 1: Giant LV pseudoaneurysm (pAn) on plane (**A**) and 3D (**B**) computed tomography.

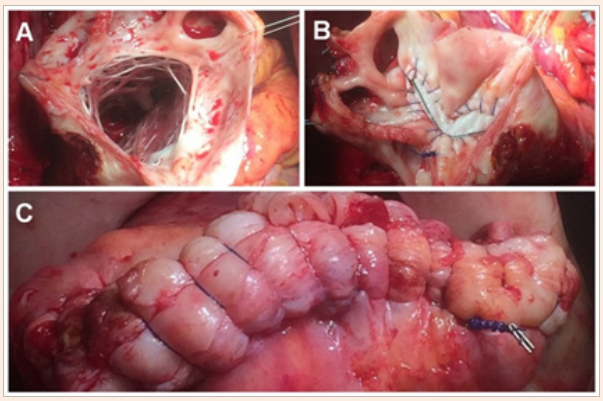

Figure 2: Intraoperative photos.

Discussion

The acquired heart aneurysms, both true and false, or pseudo-, are always a consequence of previous myocardial damage. While the walls of a true aneurysm are formed by muscular or scar tissue, the walls of a pseudoaneurysm consist of pericardial tissue, organized blood clots and dense adhesions to the cardiac surface. The anatomy and sizes of false aneurysms can vary widely from small to huge, they may have one cavity or be multi-chambered. False aneurysms are seldom localized on the anterior LV wall since its rupture usually causes cardiac tamponade and death. When rupture occurs at the apex or diaphragmatic wall of the LV the chances of formation of false aneurysm is higher due to more close contact with surrounding pericardium and, in these cases, its restrictive role [1]. The clinical history of an LV pseudoaneurysm depends on its size, location and involvement of surrounding anatomical structures. Most often patients have non-specific complaints, such as a dyspnea, fatigue or chest pain. About 10% of LV pseudoaneurysm are asymptomatic [1]. A detailed and conclusive diagnosis is, of course, derived by contrast-enhanced computed tomography which allows to evaluate the aneurysm anatomy, its size, involvement of surrounding tissues, the size of its neck, as well as to create a 3D model that in case of surgery can help to choose a proper strategy. However, the transthoracic echocardiography also could be very helpful and precise in detecting LV pseudoaneurysms.

The risk of a LV pseudoaneurysm rupture is very high (35-40%) [1,4]. However, not all pseudoaneurysms have to be operated. In the case of asymptomatic pseudoaneurysm with a diameter <30 mm, which doesn't increase over time, and in the absence of any concomitant cardiac disease in need of surgery, it can be managed conservatively with regular control of pseudoaneurysms size by echocardiography or tomography [3]. It is important to note that in some cases it is possible to prevent the development of LV pseudoaneurysm after an acute cardiac trauma following accurately the FAST protocol, to diagnose a possible LV rupture and to take proper actions in time [5]. As for surgical treatment of LV pseudoaneurysms, the most difficult problems are acute post infarction pseudoaneurysms and ones developed as a result of a rupture of a LV after mitral valve replacement [2]. Traumatic LV pseudoaneurysms, especially in a chronic stage, do not represent any special problems for the surgeon since these patients have no coronary disease, the loss of myocardial tissue is relatively small, the LV geometry is not altered. The scar tissue at the neck of the aneurysm allows to close the site of the rupture securely. These circumstances defined the success in our case.

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