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Surgical Treatment of Asymptomatic Left Ventricular Pseudoaneurysm Which Occurred After A Long Period from Cardiac Surgery: Case Report

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Abstract

Left ventricular pseudo-aneurysms are rare clinical conditions that can have serious consequences if left untreated. Pseudo-aneurysms differ from true aneurysms, in that they do not contain endocardium or myocardial tissue, but only pericardium and fibrous elements. Pseudo-aneurysms often develop secondary to myocardial infarction, but can also be seen after cardiac surgery, infective endocarditis, and trauma. In this study, a case of an asymptomatic left ventricular pseudo-aneurysm that was noticed incidentally after a long period of cardiac surgery and showed rapid growth within a year was presented. Due to limited experience in left ventricular pseudo-aneurysm surgery, we wanted to share the successful surgical treatment, echocardiography, and radiological images of the case.

Keywords: Left ventricular pseudo-aneurysm, cardiac surgery, ventriculoplasty

Introduction

Left ventricular pseudoaneurysms (LVP) are rare clinical conditions that can have serious consequences due to the high risk of rupture. Pseudoaneurysms differ from true aneurysms in that they do not contain endothelium or myocardial tissue, but only pericardium and fibrous elements. LVP often develops as a result of myocardial infarction (MI), but can also occur after cardiac surgery,

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infective endocarditis, and trauma[1]. It can be clinically silent, but it can also result in hemopericardium, subsequent cardiac tamponade, and sudden death. While ventricular aneurysms are seen in 22% after MI, pseudoaneurysms have been reported to be less than 0.5%[2,3]. LVP can progress with a very high mortality rate (23-50%) in cases that are treated surgically, particularly in the early period after MI[4,5]. The best diagnostic method is contrast ventriculography[6]. In treatment, small-scale asymptomatic cases can be managed with surgical repair, percutaneous, and conservative methods[7]. In this study, we presented a case of asymptomatic LVP that was noticed incidentally and showed rapid growth within a year after a long period of cardiac surgery. Due to our limited experience in LVP surgery, we wanted to share the successful surgical treatment of the case its echocardiography, and its radiological images.

Case Presentation

The patient is a 59-year-old male who had a coronary bypass surgery 7 years ago and has hypertension and hyperlipidemia. He had no history of previous trauma or intervention. Informed consent for surgery was obtained from the patients. Since this is a case report, ethical approval is not applicable. The patient, who was under follow-up at an external center, was told that he had a small bubble (2x1.5 cm) in his heart a year ago and that it needed to be monitored. He was referred to our clinic, because of rapid growth in his measurements over the past year. The patient had no clinical complaints. The transthoracic echocardiography performed at our hospital showed an ejection fraction (EF) of 50%, no significant valve pathology, a left ventricular wall motion defect, and a pseudo-aneurysm measuring approximately 5.3x5 cm at the base of the posterior wall (Figure 1). Other laboratory parameters were within normal limits. The patient underwent cardiac computed tomography (CT) imaging, and the diagnosis of LVP was confirmed. The medications he regularly used were acetylsalicylic acid, beta blockers, and atorvastatin. In the preoperative coronary angiography, left internal mammary artery-left anterior descending,

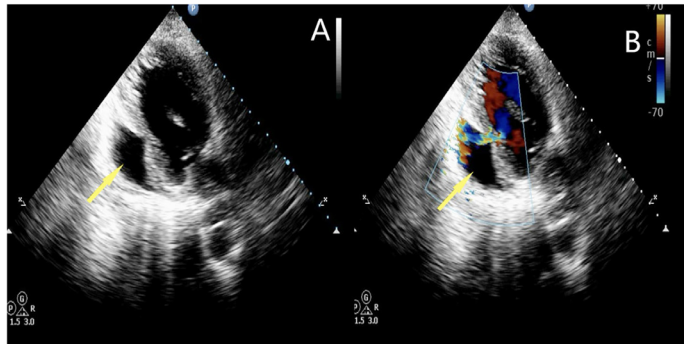

Figure 1. A, B) Preoperative echocardiographic image of left ventricular pseudoaneurysm

obtuse marginal artery (saphenous vein) and right coronary artery (saphenous vein) bypasses were open. As a result of the Cardiology-Cardiovascular Surgery Council, a surgical treatment decision was made. Median sternotomy was performed under general anesthesia. Aortic, bicaval venous, and sump cannulations were placed. Del Nido cardioplegia was given. An incision was made over the aneurysmal sac on the posterior wall of the left ventricle. A large quantity of organized thrombus was removed from the sac. A Teflon cardiac patch of approximately 5x3.5 cm was used to replace the aneurysm sac. Then, the aneurysm tissues were closed over the cardiac patch with the help of double-sided Teflon felt (Dor ventriculoplasty). The patient was extubated at the 6th hour postoperatively and discharged on the 7th day. In the first week follow-up echocardiography, EF was 50% and left ventricular wall motion disorder was observed. The pathology samples taken were reported as fibrin material, and left ventricular wall. The control CT and magnetic resonance angiography images showed thrombosis of the aneurysmal dilatation in the postero-lateral wall of the left ventricle (Figure 2).

Discussion

LVP is important to treat, as it may be, a source of embolism, arrhythmia, rupture, and result in sudden death. In the event of free wall rupture, the in-hospital mortality rate has been reported as high as 90%[8]. Congestive heart failure, chest pain, dyspnea, and syncope are the most common presenting complaints, while 10% of patients

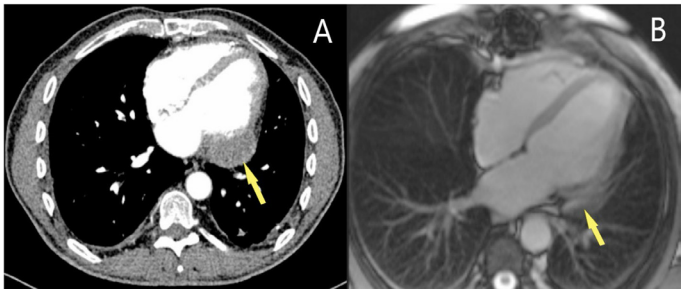

Figure 2. A, B) Postoperative CT and MRI images of a patient who underwent left ventricular pseudoaneurysm repair
CT: Computed tomography, MRI: Magnetic resonance imaging

may be asymptomatic[9]. Although there is no consensus on treatment, it has been reported that LVPs that occur within the first 3 months after MI, especially if their diameter is larger than 3 cm, require urgent surgery[2]. In chronic cases, there is no consensus because the risk of rupture decreases as the left ventricular cavity stabilizes and the high mortality of surgical treatment. Perioperative mortality has been reported to be around 10-20%[2].

In this case, although the patient was asymptomatic, a decision was made to perform surgical intervention because the LVP had shown rapid growth in the last year. In addition, the large diameter of the LVP was effective in the decision to perform surgery. Pseudo-aneurysms can also occur in the right ventricle, the left ventricle, but since the left ventricle has the largest muscle mass and is the most functionally effective part, aneurysms developing in this region attract more attention. Pseudo-aneurysms are three times more common in the inferior and posterolateral walls, as a result of occlusion of the right coronary artery or circumflex artery. In contrast, in 80-90% of cases, true aneurysms are located in the apical region or in the anterolateral wall and are a result of occlusion of the left anterior descending artery[10]. Possible conditions that may cause aneurysm during coronary artery bypass grafting (CABG) include poor myocardial protection (non-homogeneous distribution of cardioplegia), myocardial injury due to cardiac slings used to shape the heart during bypass, and aneurysm formation in the sutured areas over time. In our case, we believe that the possible causes of LVP are pseudo-aneurysm formation in areas affected by ischemia before CABG, or previous cardiac surgery. The patency of bypass grafts in coronary angiography performed before LVP repair was crucial for reaching this conclusion. In acutely developing aneurysms, the fragility of the tissue and the prevalence of acute inflammation may lead to poor surgical repair outcomes and the need for secondary intervention. Aneurysm tissue that develops on a chronic basis is more stable and, therefore, can contribute positively to surgical repair results. In conclusion, LVP surgical treatment is associated with a high mortality rate. Although the experience gained from a single case is insufficient, results may be better in slowly developing chronic cases.

Ethics

Informed Consent: Informed consent for surgery was obtained from the patients. Since this is a case report, ethical approval is not applicable.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Işık M, Görmüş N, Concept: Işık M, Görmüş N, Design: Işık M, Tutsoy F, Data Collection and/or Processing: Işık M, Tutsoy F, Tatar S, Analysis and/or Interpretation: Işık M,Tutsoy F, Tatar S, Literature Search: Işık M, Tutsoy F, Writing: Işık M, Tutsoy F.

Conflict of Interest: The authors declare no conflicts of interest concerning the authorship or publication of this article.

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