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Case Report

Sub Mitral Left Ventricular Aneurysm with Severe Mitral Regurgitation: A Case Report

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Abstract

Sub Mitral Left Ventricular Aneurysm (SMLVA) is a very rare cardiac pathology of varied etiologies. Recently, researchers have discovered a congenital basis of this pathology rather than infection or inflammation. A majority of patients with this pathology present with shortness of breath due to severe mitral regurgitation. While echocardiography is the main method of its diagnosis, further investigations may be necessary to exclude other causes. Surgery is the mainstay of treatment for this condition to prevent its complications and to improve patient's outcome. The case reported here is of a young woman, who presented with New York Heart Association (NYHA) class III/IV secondary to SMLVA. She was operated upon with excellent clinical results. While such cases have been reported previously in other South Asian countries, this is the first from Pakistan.

Keywords: Sub Mitral Aneurysm; Mitral Valve Regurgitation; Left Ventricle Aneurysectomy; Mitral Valve Replacement

Introduction

Sub Mitral Left Ventricular Aneurysm (SMLVA) is a rare but well recognize cardiac pathology. Multiple etiologies have been implicated [1, 4] in this clinical condition. We present a case report of patient with SMLVA with severe mitral regurgitation. Patient underwent for the repair of the left ventricular aneurysm and mitral valve replacement operation with an excellent clinical result.

Case Report

A 23 years old south Asian female presented with 2 years history of shortness of breath. There was no history of previous heart attack, trauma and any related inflammatory or immunological systemic disease. Clinically she was in NYHA class III-IV secondary to severe mitral regurgitation. All cardiovascular related investigations including transthoracic echo (Figure 1), CT scan of the chest (Figure 2), Trans esophageal echo and coronary angiogram (normal) confirmed the diagnosis of moderate size (49×52mm) non ischemic basolateral Left ventricular aneurysm with severe mitral regurgitation.

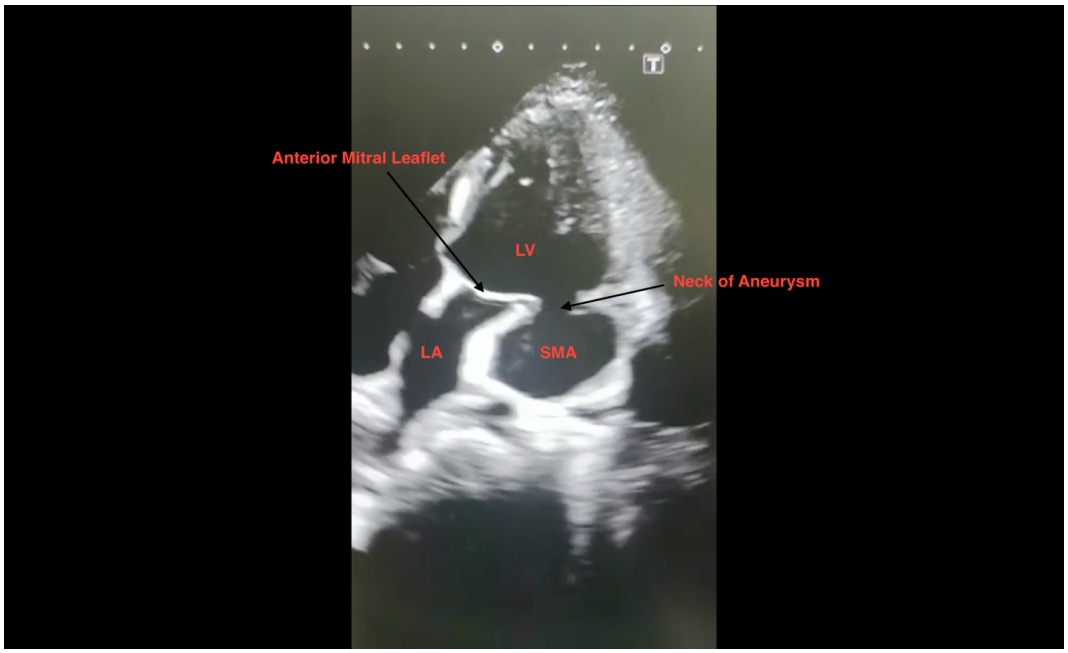

Figure 1: Echocardiogram showing: Neck of aneurysm. Anterior mitral leaflet. SMA: Submitral LV aneurysm; LV: Left Ventricle; LA: Left Atrium.

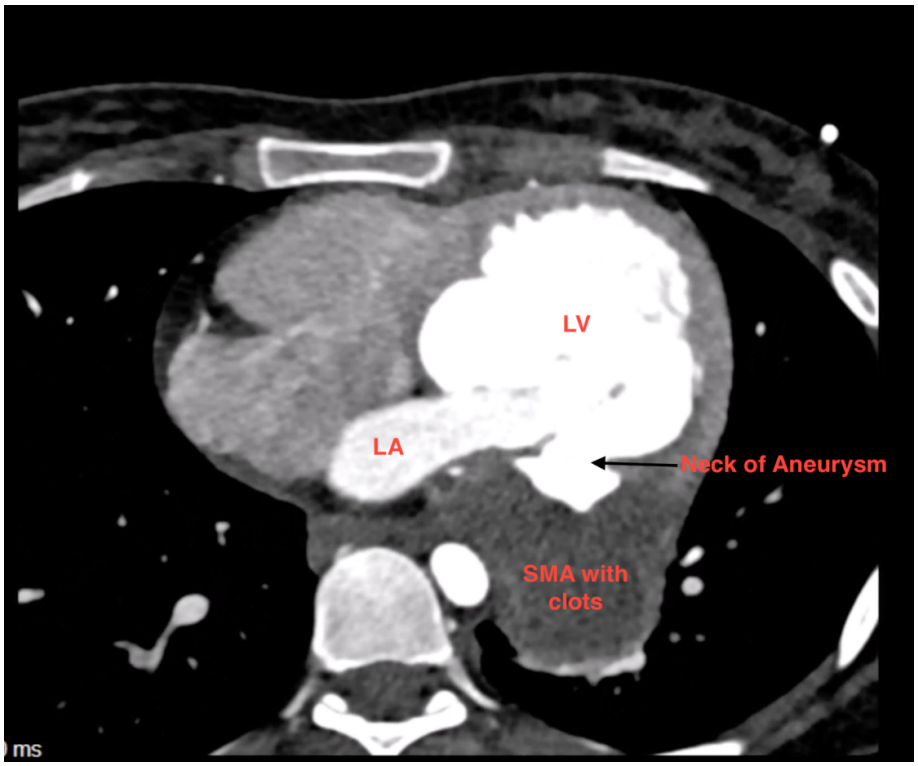

Figure 2: CT scan: SMA with clot (Submitral Left Ventricular Aneurysm). Neck of the aneurysm. Left Ventricle (LV); Left Atrium (LA)

Operation performed on cardiopulmonary bypass. The aneurysm was present at the posteriobasal part of the left ventricle which was just larger than a golf ball (Figure 3,). Aneurysm was incised and organized thrombus was removed. (Figure 3B) Endoventricular pericardial patch sutured to normal muscle at the aneurysmal circumference using running 4-0 polypropylene suture (Figure 3C and 3D). Then aneurysmal wall was closed in two layers reinforced by Teflon felt on either side. A posterior mitral annulus was distorted, therefore, mitral valve replaced by size 29mm St Jude mechanical valve.

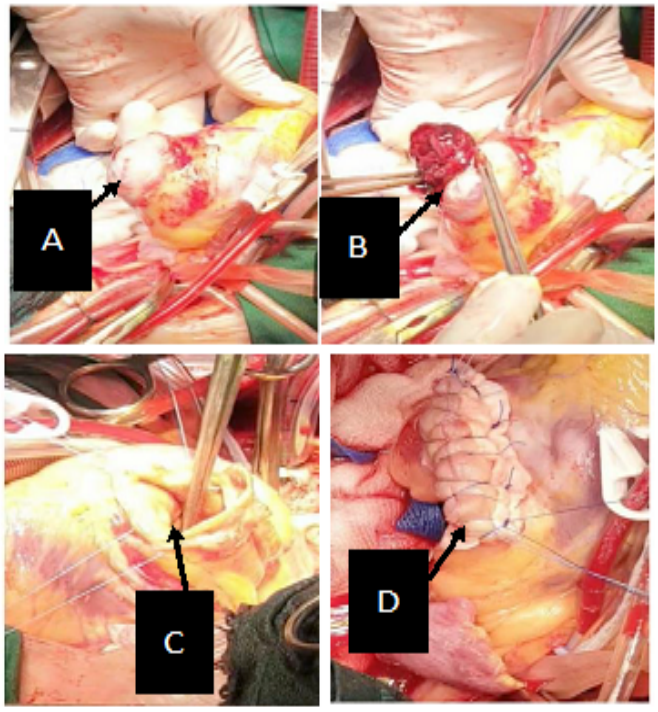

Figure 3: (A) Intraoperative image showing the aneurysm sac. Clots and organized thrombus removed. (B) Margin excised and leaving 2-3mm rim of scar. (C) Endo-ventricular pericardial patch suturing. (D) Aneurysmal wall was closed in a vertical line between two layers of Teflon felt reinforced with two layers of running 1polypropylene suture.

Following surgery, the patient was reviewed in the clinic where she was very well in NYHA class 1. The operative findings and histopathological findings confirmed the diagnosis of Submitral left ventricular aneurysm.

Discussion

SMLVA is a rare cardiac pathology with variable genetic and clinical presentation. Multiple variable genetic predispositions have been described in various literatures since its first description by Abraham, et al. [1]. Multiple other causative factors have been described ranging from congenital, traumatic and inflammatory [1-5]. However, its anatomical position mainly along the posterior mitral annulus where there is tissue weakness, has led to its probable congenital cause [3]. Moreover, there are foetal echocardiographic evidences, which confirm the congenital origin of many of these aneurysms [6,7]. In our patient along with normal coronary arteries, we did not find any past history of trauma and there were no clinical features of associated infection or inflammation. Therefore, in all probability, the cause of our patient's SMLVA is congenital.

The congenital cause of a submitral aneurysm is based on a disjunction between the left ventricle musculature and the left atrium-mitral valve region [3]. This submitral membrane which extends along varying lengths of the posterior annulus of mitral valve, forms an area of potential weakness. According to DuToit, et al. [4] the extent of the aneurysmal process can vary from a small area to the entire region of the posterior mitral annulus. As a result, they classified submitral aneurysm into 3 types, namely Type I—single localized neck; Type II—multiple necks; Type III—involvement of the entire mitral annulus. Hence, the basic pathology of SMLVA is a separation of the posterior mitral annulus from the left ventricle musculature which creates an outpouching in the left ventricle wall. This process will distort the mitral annulus and its supporting apparatus, resulting in leaflets malcoaptation leading to mitral regurgitation.

SMLVA may present with myocardial ischaemia secondary to the compression of left coronary artery [8], thromboembolism [8], or arrhythmias [5]. However, the patient reported here, presented with NYHA class III-IV secondary to severe mitral regurgitation.

We believe following the heart team discussions, surgery is the mainstay of treatment for this rare clinical condition. It should be caried out not only to improve the hemodynamics by correcting the mitral regurgitation but also to prevent its associated complications [5,8].

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