



MITRAL AORTIC INTERVALVULAR FIBROSA PSEUDOANEURYSM RUPTURE INTO LEFT ATRIUM PRESENTING AS ACUTE HEART FAILURE.

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ABSTRACT We present a rare case of pseudo-aneurysms of mitral aortic intervalvular fibrosa (MAIVF) rupturing into left atrium and presenting as rare cause of acute heart failure. Trans esophageal echocardiography and computed tomography depicted the anatomy for planned surgery.

KEYWORDS : Mitral aortic intervalvular fibrosa pseudo aneurysm, trans esophageal echocardiography, computed tomography

INTRODUCTION

Mitral aortic inter valvular fibrosa (MAIVF) is the anatomical zone between mitral and aortic valve annulus¹. We present a rare case of pseudo aneurysms of MAIVF rupturing into left atrium leading to sudden acute left ventricular failure.

Case report

A 20 years old patient presented with acute dyspnea at rest, cough, orthopnea. He had history of dyspnea and cough & history of fever few days back. Auscultatory examination revealed extensive crepts all over chest and a holosystolic murmur. Clinical diagnosis of mitral valve regurgitation was made. 2D echocardiogram of the patient revealed an intra-atrial sac like structure was found in vicinity of the mitral aortic leaflet communicating with left atrium (Figure 1 & 2). Patient was subjected to multislice contrast enhanced cardiac CT for confirmation. Cardiac CT combined with HRCT of the lungs were performed using 128 slice dual energy CT scanner (Siemens Somatom Definition Flash, Siemens, Erlangen, Germany). Coronary CT protocol was applied with retrospective ECG gating algorithms. 100 ml Iohexol - water soluble non-ionic iodinated contrast medium was injected intravenously with flow rate of 4ml/second, followed by saline bolus flush. Post-processing was done on Siemens SyngoVia workstations (2018 version).

Cardiac CT revealed a broad necked out-pouching arising left to the non-coronary aortic cusp, communicated with the left ventricular outflow tract. The out pouching was bulging into the left atrial lumen during systole and collapsing during the diastole. Walls of the out pouching were smooth and non-enhancing. No wall calcifications were present. It showed direct communication with left atrium, which was confirmed on trans-esophageal echo images. The left coronary artery passed anterior to the aneurysm and showed normal distal opacification. Aortic valve was normal in morphology. Sinus of Valsalva was normal, which ruled out sinus of Valsalva aneurysm (Figure 3).

CT images in the lung window revealed multiple ill-defined patches of consolidations in both the lungs and bilateral pleural effusions. The consolidations Patient did not have clear cut evidence of infective endocarditis; blood cultures were negative & no vegetation. Chest X ray revealed ground glass appearance suggestive of atypical pneumonia and patient was empirically treated with antibiotics for 3 weeks. He remained in heart failure despite high dose diuretics and supportive therapy and was referred for surgery.

DISCUSSION

MAIVF is the fibrous junction of 3 anatomical regions - left half of the non-coronary aortic cusp, adjacent 3rd of left coronary aortic cusp and

anterior mitral leaflet. MAIVF continues with ventricular musculature. This area is important for anatomical and functional integrity of both the valves¹.

Pseudo-aneurysms of this tract form due to perforation due to blunt chest trauma, surgical trauma and endocarditis. Due to avascular nature, MAIVF is prone to infections. Infections can spread directly from an already infected valve or may develop secondary due to aortic blood jet strike. Infection of MAIVF results in subaortic abscess formation, which in turn leads to pseudo aneurysm formation².

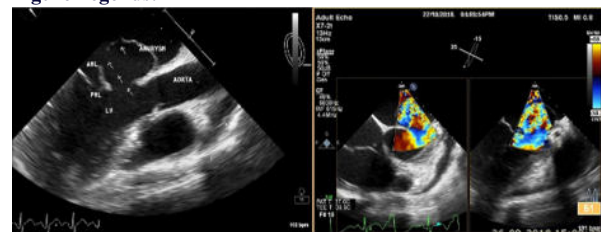
Unruptured pseudo aneurysms have connection with left ventricular outflow demonstrate systolic filling and diastolic emptying or collapse unlike aortic annulus abscess, which is a close imaging differential. Aneurysms can complicate and rupture into left atrium, leading to severe acute mitral regurgitation or pericardial space leading to cardiac tamponade. Growing pseudo-aneurysms can cause mass effect on left atrium, coronary arteries and pulmonary artery³⁻⁵.

First line investigation for the diagnosis is echocardiogram. Transthoracic echocardiogram and trans esophageal echocardiogram can be used to delineate the anatomy of the aneurysm. MDCT coronary angiogram and cardiac CT provide additional anatomical information and planning for surgery which is recommended even for asymptomatic aneurysms⁶.

CONCLUSION :

In patients with acute heart failure with history of febrile illness pseudo aneurysms of mitral-aortic intervalvular fibrosa communicating with left atrium should be a differential diagnosis. Echocardiography & Multislice cardiac CT are essential to anatomic delineation and surgical planning.

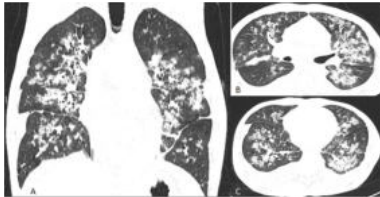
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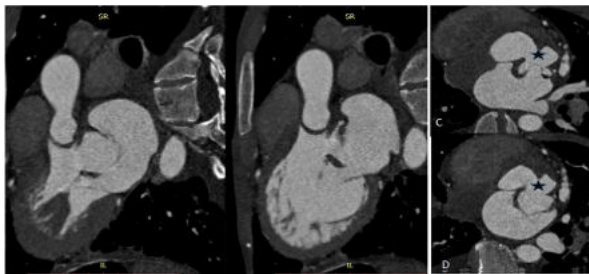
1. 2-D Echocardiogram images in long axis (A) B mode and colour mode (B) in systole, demonstrate a thin walled outpouching arising from mitral leaflet. Neck of the aneurysm (white arrows) communicates with the left ventricular outflow. Small fenestration is

present along the apex of the aneurysm, denoting atrial communication. The aneurysm shows filling in systole and a colour filling showing a leak at the fenestration.

2. Coronal (A) and Axial (B, C) images in the lung window show multiple ill-defined patches of ground glass attenuation and consolidation in both lungs.



3. Oblique sagittal (A & B) and Axial (C & D) cardiac CT images showing thin walled contrast filled sac at the expected locations of MAIVF. Mouth of the sac (star) opens in aortic outflow track, with the sac being filled in systolic phase and emptying in diastolic phase. The sac is bulging into the left atrial lumen. There is communication with left atrium.



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