

## Atrioventricular Groove Calcification in Constrictive Pericarditis - A Rare Case Report

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**Abstract:** Constrictive pericarditis causes impaired diastolic function of the heart and is an uncommon antecedent of heart failure. But it is difficult to diagnose it through imaging modalities. The presence of pericardial calcification is the key to arrive at its diagnosis. Here, we report a case of atrioventricular groove calcification in a 62 year old male patient admitted to our Hospital with a 5-month history of gradually worsening dyspnea on exertion, swelling of abdomen, scrotum and lower limbs and difficulty to lie down supine. It was likely to be of tubercular origin.

**Key words:** atrioventricular groove, computerised tomography, pericardial calcification

### I. Introduction

Constrictive Pericarditis is an uncommon cause of heart failure and occurs due to fibrosis and/or calcification of the pericardium. The cause is usually idiopathic followed by viral pericarditis, previous cardiac surgery and mediastinal radiation; but in developing countries like India, tuberculosis still remains a common cause. It is important to distinguish constrictive pericarditis from other causes of heart failure but it is difficult to arrive at its diagnosis. The presence of pericardial calcification observed by computerised tomography (CT) scan is the key to diagnosis. Here we report a rare case of annular or ring shaped pericardial calcification along the atrioventricular groove causing constrictive pericarditis.

### II. Case Report

A 62 year old male patient was admitted to the Department of Medicine of our Institute with symptoms of gradually worsening dyspnea on exertion, swelling of abdomen, scrotum and lower limbs over a period of 5 months. He had no relevant past medical history. He had not undergone previous cardiac surgery or exposed to mediastinal radiation.

His chest roentgenogram showed ring shaped calcification in the cardiac silhouette (Fig1). Contrast enhanced CT Scan of the chest revealed diffuse dense annular calcification (upto 18 mm thickness) along the atrioventricular groove of the heart (Fig2). Bilateral atrial enlargement was also noted. The diameter of superior vena cava was found to exceed that of the descending aorta. Other findings included bilateral pleural effusion and thickening with punctate pleural calcification and ascites. Reconstructed CT demonstrated ring shaped thick calcification along the atrioventricular groove (Fig3). Lung window revealed no abnormality. Four chambered view on ultrasound showed the classic picture of atrioventricular groove calcification (Fig4). Echocardiography confirmed biatrial enlargement and pericardial calcification. Multimodality approach helped to support the final diagnosis.

Investigations were performed to confirm the etiology. Mantoux test was positive (18mm induration after 72 hours) and ESR was elevated to 60. The patient was put up on antitubercular therapy along with drugs for treatment of heart failure. He has reported improvement in his symptoms since then. Informed Consent was taken from the patient for this study.

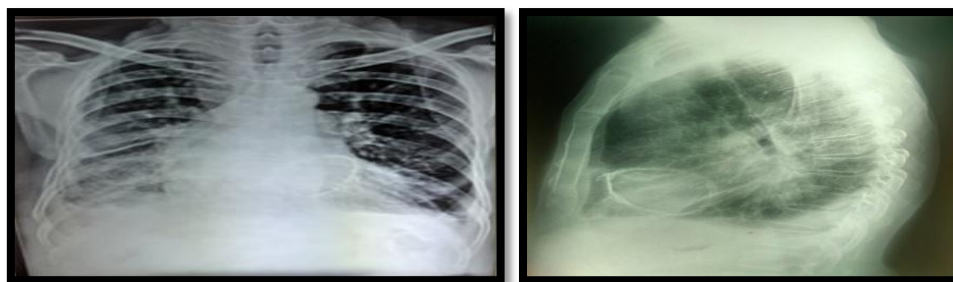
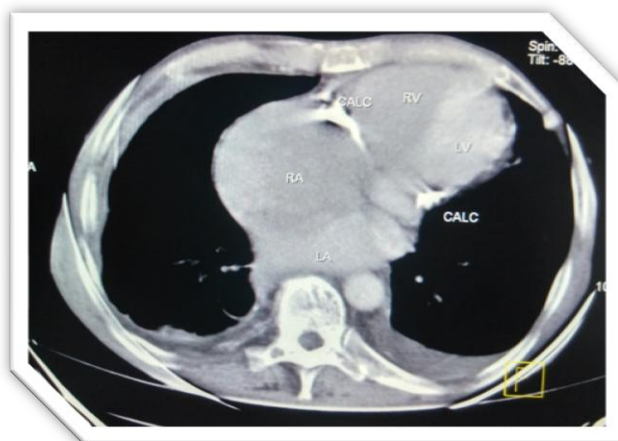
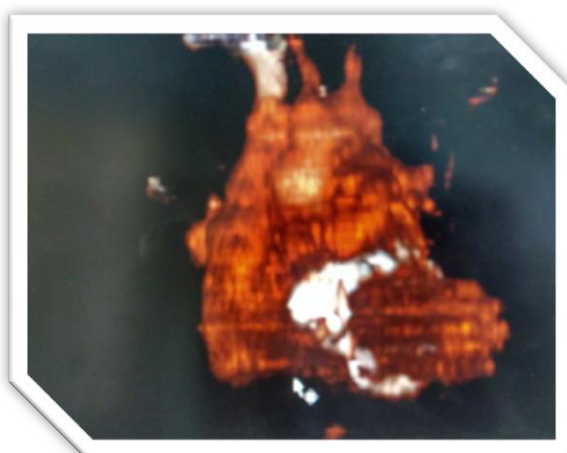


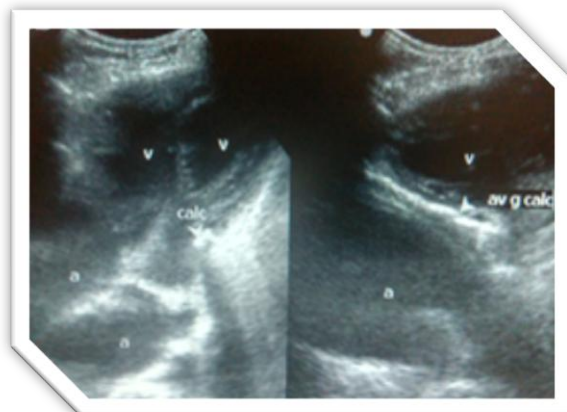
Fig 1. Chest X –ray ( AP and Lateral Views) showing ring shaped pericardial calcification



**Fig 2.** CECT Thorax revealing dense calcification along atrioventricular groove and bilateral pleural effusion



**Fig 3.** Reconstructed CT showing dense annular calcification along atrioventricular groove of the heart.



**Fig 4.** Ultrasound (four chambered long and short axis views) demonstrating A-V calcification with atrial enlargement.

### **III. Discussion**

Constrictive pericarditis refers to chronic inflammation of the pericardium leading to fibrosis, calcification with loss of normal pericardial elasticity which impedes filling of cardiac chambers and consequently reduced cardiac output.

The diagnosis of constrictive pericarditis should be considered in patients with atypical chest X-ray calcification and features of right heart failure such as exertional dyspnea, hepatic congestion, lower limb edema with subsequent development of anasarca. However other cardiac diseases like restrictive cardiomyopathy and tricuspid regurgitation can cause similar symptoms of right heart failure.

As described by Reinmuller and colleagues the CT scan signs of constrictive pericarditis include diffuse, focal, or annular pericardial thickening or calcification, enlargement of the atria or atrium, dilatation of the superior vena cava or inferior vena cava, tube-like configuration of the ventricles or narrowing of the arterioventricular groove, and alteration of the interventricular septum [1]. The first four features were present in our patient. Pericardial calcifications are considered an important finding suggestive of constrictive pericarditis on chest radiograph ( particularly lateral view) and computerised tomography of chest[2] with CT being the most appropriate and accurate tool to depict even minute amounts of calcification[3]. Ling et al reported that presence of pericardial calcification frequently implicates constriction as the cause of symptoms, regardless of degree of pericardial thickening.[4] In this study, roentgenological localisation of pericardial calcification was achieved in 36 out of 135 patients with constrictive pericarditis who underwent pericardiectomy. They mostly found pericardial calcification on the inferior diaphragmatic border of the heart(97%), rather than the atrioventricular groove(62%). According to De Luca et al the pericardial calcification commonly encases the entire heart, but our finding was a rarer case of annular calcification of the atrioventricular groove only. [5]

It is believed that the AV groove and right ventricular body-infundibulum junction are the transitional gutter like areas and relatively fixed structures between the atria and the dynamic ventricles. This may result in stasis of an organising collection in this region which is replaced over years with cicatrix fibrocalcific tissue. Mu Sook Lee et al suggest that mediastinal irradiation and open heart surgery are leading causes of constrictive pericarditis [6] but calcification in the AV groove is a common occurrence in the tubercular origin of constrictive pericarditis [7]. The presence of pleural thickening and calcification with a positive mantoux test support tubercular etiology in our case.

#### **IV. CONCLUSION**

This case demonstrates a unique pattern of pericardial calcification in the atrioventricular ring alone through various imaging modalities in a patient of tubercular constrictive pericarditis. The latter is an important cause of right heart failure that should be considered in developing countries and pericardial calcification is more important than pericardial thickening in the diagnosis of the condition.

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