

# Calcified Amorphous Tumour of Left Ventricle: a Rare Cardiac Tumour

Rupesh Kumar<sup>1</sup>, Vikram Halder<sup>1</sup>, Soumitra Ghosh<sup>1</sup>, Basant Kumar<sup>1</sup>, Subhrashis Niyogi<sup>2</sup>, Balamurugan Thirunavukkarasu Thirunavukkarasu<sup>1</sup>, and Amanjit Bal<sup>1</sup>

<sup>1</sup>Post Graduate Institute of Medical Education and Research

<sup>2</sup>PGIMER

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## Abstract

Cardiac calcified amorphous tumor is a rare, non-neoplastic, pedunculated, intra-cavity mass, with very high preponderance of distal embolisation. Differentiation from calcified atrial myxoma or calcified thrombi is very difficult. Histo-pathologic examination is the mainstay of diagnosis. Treatment is emergency excision. A 46-year-old female presented with heart failure. On echocardiography, 1.9x1.7 cm pedunculated mobile mass in left ventricle attached to intraventricular septum was seen. On cardiac MRI lesion was isointense. The mass was excised. Histopathology revealed fibrin deposition with eosinophilic amorphous material in the centre with calcification in the periphery without any myxomatous tissue. A final diagnosis of CAT was established.

## TITLE PAGE

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#### Authors

Rupesh Kumar<sup>1</sup>, Vikram Halder<sup>1</sup>, Soumitra Ghosh<sup>2</sup>, Basant Kumar<sup>2</sup>, Subhrashis Guha Neogi<sup>3</sup>, Balamurugan Thirunavukkarasu<sup>4</sup>, Amanjit Bal<sup>4</sup>

1. Department of Cardio-Thoracic Surgery, PGIMER, Chandigarh, India
2. Department of Cardiology, PGIMER, Chandigarh, India
3. Department of Cardio-Thoracic anaesthesia, PGIMER, Chandigarh, India
4. Department of histopathology, PGIMER, Chandigarh, India

#### Address for Correspondence

Dr Basant Kumar, MD, DM

Department of Cardiology,

Advanced Cardiac Centre,

Post Graduate Institute of Medical Education & Research,

Sector 12, Chandigarh – 160 012. India.

Telephone No. +91 172 403 7834

Email: basantvimal@gmail.com

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*Author List*

Dr. Rupesh Kumar

MS (General Surgery), MCH (Cardio Thoracic Surgery),

Assistant Professor

Department of CTVS,

Post graduate institute of medical education and research

rkctvs@gmail.com

Dr. Vikram Halder

MS (General Surgery)

Post graduate institute of medical education and research

vikramavnrt@gmail.com

Dr. Soumitra Ghosh

MD (Internal medicine)

Post graduate institute of medical education and research

soumitra183@gmail.com

Dr Basant Kumar,

MD (Internal medicine), DM (Cardiology),

Assistant Professor,

Post Graduate Institute of Medical Education & Research,

basantvimal@gmail.com

Dr. Subhrashis Guha Neogi

MD (Anaesthesiology)

Post graduate institute of medical education and research

09renol@gmail.com

Dr. Balamurugan Thirunavukkarasu

MD (Pathology)

Post graduate institute of medical education and research

Bala.potter@gmail.com

Dr Amanjit Bal

MD (Pathology)

Assistant Professor,

Post Graduate Institute of Medical Education & Research,

Docaman5@hotmail.com

## Calcified Amorphous Tumour of Left Ventricle: a Rare Cardiac Tumour

### Abstract

Cardiac calcified amorphous tumor is a rare, non-neoplastic, pedunculated, intra-cavity mass, with very high preponderance of distal embolisation. Differentiation from calcified atrial myxoma or calcified thrombi is very difficult. Histo-pathologic examination is the mainstay of diagnosis. Treatment is emergency excision. A 46-year-old female presented with heart failure. On echocardiography, 1.9x1.7 cm pedunculated mobile mass in left ventricle attached to intraventricular septum was seen. On cardiac MRI lesion was isointense. The mass was excised. Histopathology revealed fibrin deposition with eosinophilic amorphous material in the centre with calcification in the periphery without any myxomatous tissue. A final diagnosis of CAT was established.

**Key words:** Calcified amorphous tumor, Nonneoplastic Mass, Echocardiography

### Learning Objectives:

1. CAT is a rare non-neoplastic tumour of the heart
2. CAT is a differential diagnosis of calcified atrial myxoma, calcified thrombi and other calcium containing tumours of the heart
3. Treatment is emergency excision to prevent distal embolisation
4. Histo-pathologic examination is the mainstay of diagnosis

### Introduction

Cardiac calcified amorphous tumour is a rare non-neoplastic cardiac mass which is composed of amorphous fibrinous material and calcium. This tumour was first described by Reynolds and colleague.[1] Most common site is mitral annulus followed by right atrium, right ventricle, left ventricle, left atrium, tricuspid annulus.[2] Clinicopathologically it mimics as calcified Myxoma and calcified thrombi and on transthoracic echocardiography it is very difficult to distinguish between this entity. Patients may present with dyspnea (due to obstruction) or clinical features of distal embolisation. Echocardiography is the primary modality for diagnosis but histopathological examination is the gold standard. As there is risk of distal embolisation early surgery is needed followed by histopathological confirmation.

### Case presentation

A 46 year old female patient present to emergency with decompensated heart failure with cardiogenic shock and renal shutdown. She is known case of chronic kidney disease (stage 4) on medication and one episode of thromboembolic cerebrovascular accident (right fronto-parietal infarct) 2 month ago.

After initial medical optimization echocardiography was done. On echocardiography (Figure 1)) 1.9x1.7 cm pedunculated mobile mass in left ventricle which is attached to intraventricular septum with left ventricular ejection fraction 40-45%. On cardiac MRI (Figure 2) isointense lesion in left ventricle which is attach to endocardium through a narrow pedicle. As per institutional protocol coronary angiography done and on angiography mid part of left anterior descending (LAD) artery is 70 to 80 percent stenosed and posterior descending artery(PDA) is 80 percent stenosed.

Patient was taken for surgery. (Figure 3) After sternotomy left internal mammary artery and right sided great saphenous vein (RSVG) were harvested. After heparinization aorto bicaval cannulation was done and cross clamp was applied. Right atrium was opened atrial septum was incised. Then left ventricular mass was resected and intraatrial septum and right atrium was closed .RSVG was anastomosed to PDA and ascending aorta and LIMA was anatomosed to LAD. Then gradually crossclamp was off and decannilation was done. After application of intercostals drain and pacing wire sternum was closed. Immediately after operation ventilation time was 12 hours and vasoactive inotropic score was 28. Intensive care unit stay and hospital stay were 4 days and 7 days respectively.

Histopathology of the tumour revealed fibrin deposition with eosinophilic amorphous material in the centre with periphery of the lesion showing calcification. No myxomatous tissue was seen (Figure 4)

On 6 month followup there was no recurrent mass and functional status of the patient was NYHA II.

## Discussion

Primary cardiac tumour is rare and most common tumour is atrial Myxoma. Calcified amorphous tumour (CAT) is a rare cardiac mass. This tumour is more common in female than in male. Most of the affected patients are of fifth decade.

Pathogenesis of the tumour is formation of thrombus due to hypercoagulability and abnormal calcium and phosphorus metabolism. Growth rate of calcified amorphous tumour is slow but growth rate of calcified amorphous tumour associated with mitral annular calcification is fast. Most common location is mitral annulus which is commonly due to previous mitral annular calcification and it is commonly due to end stage renal disease. Other affected chambers of the heart according to incidence are right atrium, right ventricle, left ventricle, left atrium and tricuspid annulus.[2]

Most common presenting symptom is dyspnea on exertion due to obstruction of the blood flow. Other presenting features are angina, syncope (due to distal embolism), pulmonary embolism, systemic embolism and rarely patient may be diagnosed incidentally. Other associated diseases are valvular heart disease, end stage renal disease, hyperparathyroidism. Chances of embolic events is more in calcified amorphous tumour with mitral annular calcification.[3]

On echocardiography CAT is described as pedunculated calcified mass. Size may vary from small punctate lesion to very large mass. Myxoma is mobile mass and 20 % of atrial Myxoma are calcified. Cardiac fibroma is calcified intra myocardial mass in which commonly left ventricle is involved. Other cause of cardiac calcification are end stage renal disease and thrombus.[4] On CT scan or MRI calcified amorphous tumour are either irregular, ovoid, triangular, spherical or tubular. On configuration mass is either polypoid or infiltrative with or without broad base and distribution of calcification is partial or diffuse. On cardiac MRI homogenous appearance with low signal intensity on T1 and T2 weighted spin echo sequences without post gadolinium contrast enhancement in early and delayed sequences.[5]

Patients are treated with operative management. After midline sternotomy aorto bicaval or aorto atrial cannulation is done according to the chamber involved. Right atrial and right ventricular lesion are approached through right atrium. Left atrial lesions are approached through left atrium or right atrium. Left ventricular lesion are approached through left atrium. Ventricular approach are not preferred because of increased chance of ventricular tachycardia. On histopathological examination deposition of heterogeneous calcium with surrounding amorphous eosinophilic and fibrinous material is found.[6] Immediate postoperative outcome is good with very less chance of recurrence.[2]

**Conclusion:** Calcified amorphous tumour is rare tumour. Early detection and management is needed to prevent complication. Recurrence is rare. Since clinico-echocardiographical presentation is similar, histopathological diagnosis is mandatory.

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## Conflicts of interest

None for any of the authors

## Informed consent

Informed consent was obtained from patient for the publication of this case report

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### Figure Legends:

Figure 1A: 2-D echocardiography, PLAX view showing 1.9x1.7 cm pedunculated mass in the left ventricle

Figure 1B: 3-D echocardiography showing 1.9x1.7 cm pedunculated mobile mass in left ventricle attached to intraventricular septum

Figure 2: Cardiac MRI showing isointense mass in left ventricle attached to endocardium of interventricular septum through a narrow pedicle

Figure 3A: Tail of the mass in the left ventricle attached to the interventricular septum(trans right atrial approach)

Figure 3B-Mass in left ventricle after retracting the tricuspid leaflet

Figure 4A: Low magnification view of calcified amorphous tumour. There is fibrin deposition with eosinophilic amorphous material in the centre (H&E 10X)

Figure 4B: Periphery of the lesion showing bluish calcification (H&E 40X)

Figure 4C: Focal ossification highlighted by grungy amphophilic material (H&E 40X)

Figure 4D: Martius Scarlet Blue stain highlighting the fibrin as red colour (MSB ; 40x)





