



**Fig. 5.4:** Contrast MRI showing faint heterogenous enhancement of prosthetic mitral valve (arrow)

### Radiological Diagnosis and Pathological Correlation

Cardiac MRI was done which revealed thickened prosthetic mitral valve with surrounding enhanced soft issue consistent with vegetation. 2D echo was done which revealed no signs of any valve dysfunction.

Serial blood cultures were sent in view of expected bacterial infection, and which came out positive for bacterial infection.

### Treatment

Then she was being discharged on long term oral antibiotics for prophylaxis and repeat echocardiography after 6 weeks interval revealed grossly normal prosthetic valve with resolution of vegetations.

*Differential diagnosis includes myxomas, thrombi, lipomas, and papillary fibroelastomas*

- Myxomas usually demonstrate characteristic mobility on cine gradient-echo images. They show early moderate heterogeneous enhancement (MHE) and delayed high heterogeneous enhancement (HHE) after contrast administration (Fig. 5.8).
- Contrast-enhanced cardiac MRI reveals thrombi as low-signal-intensity, because they are avascular (Fig. 5.6).
- Lipomas demonstrate signal suppression on fat-saturated sequences (Fig. 5.7).
- Papillary fibroelastomas (PFs) appear as hypointense mobile masses on cine gradient echo images which show high signal intensity after contrast administration (Figs 5.5a and b).

signal on inversion recovery T1-weighted images was observed throughout the myocardium in all of the patients. Similar changes were seen in the other patients, but they were more subtle. This pattern differs from common patterns of enhancement associated with other entities such as ischemic infarction, which usually shows intense subendocardial or transmural enhancement; infiltrative diseases such as sarcoidosis or lymphoma, in which enhancement is often focal; and interstitial fibrosis, which may show longitudinal striae of midwall enhancement. The degree of enhancement was considerably less than that seen with replacement fibrosis of myocardial infarction (MI).

### Conclusion

Cardiac and renal amyloidosis is a rare finding. The presentation was unique and posed a diagnostic challenge. Prognosis of AL chain amyloidosis is poor and mortality is high. In conclusion, we consider the combination of widespread heterogeneous myocardial enhancement with other supporting features of infiltrative myocardial disease to be relatively specific for cardiac amyloidosis. Earlier diagnosis with therapeutic interventions portends a better response to current therapy and prolonged survival.

### Suggested Reading

1. Kyle KA, Kobert A. Bayed, Kuwin D, and Amyloidosis: Review OP 236 Cases; Medicine: July 1975, Volume 54, Issue 4, pp. 271–299.
2. J.D. Sipe, M.D. Benson, J.N. Buxbaum Amyloid fibril protein nomenclature: 2010 recommendations from the nomenclature committee of the International Society of Amyloidosis Amyloid, 17 (2010), pp. 101–104.
3. R.H. Falk, R.L. Comenzo, M. Skinner The systemic amyloidoses N Engl J Med, 337 (1997), pp. 898–909.

### Case 2

Patient is 49-year-old male, non-smoker, h/o hypothyroidism is there.

Patient has symptoms of CHF—anasarca and pedal edema.

Echocardiography was done outside which showed mild left ventricular hypertrophy (LVH), EF = 35% and global hypokinesia of left ventricular wall.

Patient was referred for cardiac MRI to rule out infiltrative cardiomyopathy.

### Cardiac MRI Findings

1. Mild LVH (Fig. 6.4).
2. Delayed enhancement image showed patchy enhancement in mid-left ventricular wall (Fig. 6.5).
3. Mild hypokinesia.
4. Reduced left ventricular systolic function. EF = 31%.
5. Mild MR and TR.
6. Pleural effusion and pericardial effusion (Fig. 6.3).
7. Aortic flow analysis showed normal LVOT gradient.

## Results

MRI findings were

1. Hypokinesia of septum and apex of LV.
2. In first pass perfusion delayed arrival of the enhancement is demonstrated in antero-septal wall of LV suggesting perfusion defect.
3. Late gadolinium enhancement (LGE) image showed areas of LGE in the septal mid-apical segments and in the subendocardium of the lateral and inferior apical segments.
4. Overall features were suggestive for myocardial infarct involving the territory of the LAD.

Conventional angiography was done which showed consistent findings.

## Discussion

Cardiac MRI is a valuable modality for confirming and evaluating intracardiac thrombi. CMR identifies “mural thrombus formation” as an indication of medical necessity for CMR.

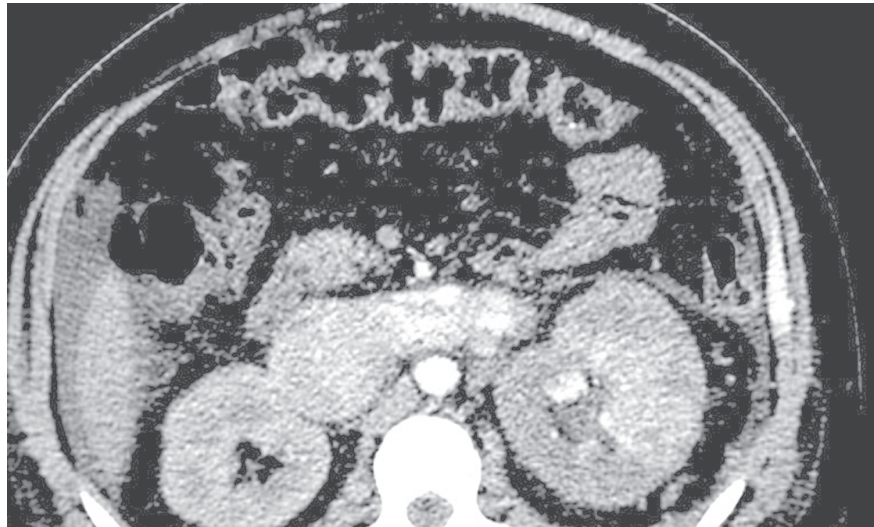
In patients with a history of ischemic heart disease or MI, ventricular thrombi frequently occur as complications. These thrombi can lead to stroke, pulmonary embolism, or peripheral arterial embolism.

Contrast-enhanced MRI provides the highest sensitivity and specificity for LV thrombus when compared to other imaging modalities, and should be considered in the care of patients at high risk of LV thrombus formation.

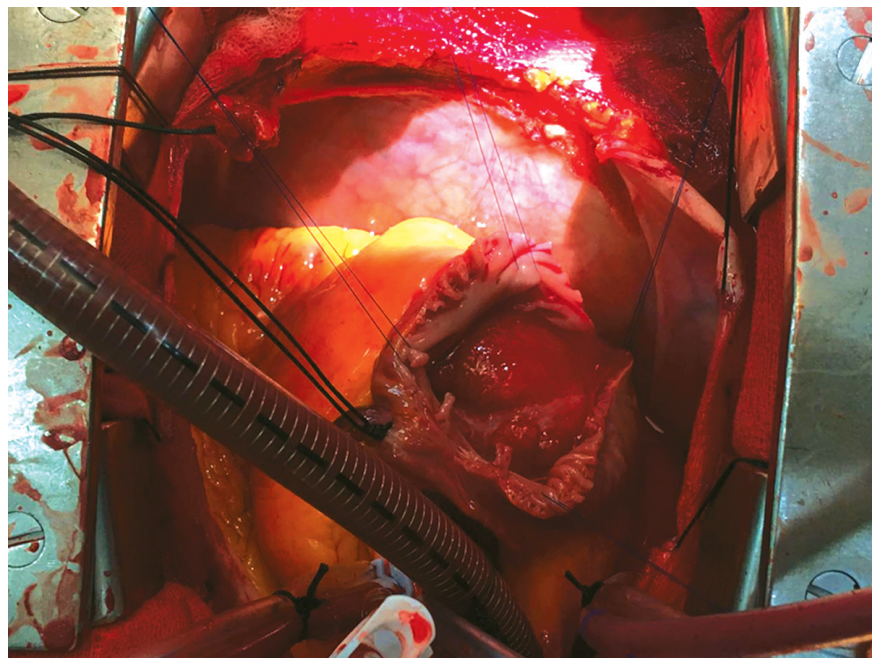
CMR complements other imaging modalities to detect thrombi which are hard to visualize. For example, cardiac MRI is significantly more sensitive than echocardiography for detecting ventricular thrombi (VT). Studies have demonstrated an approximately twofold increase in sensitivity for the detection of ventricular thrombi when comparison is made with echocardiography. Cardiac MRI is exquisitely sensitive for the detection of even small ventricular thrombi when certain techniques are conducted with intravenous contrast.

## Suggested Reading

1. Grizzard J, Ang G. Magnetic resonance imaging of pericardial disease and cardiac masses. *Cardiol clin.* 2007.
2. Srichai M, et al. Clinical, imaging, and pathological characteristics of left ventricular thrombus: A comparison of contrast-enhanced magnetic resonance imaging, transthoracic echocardiography, and transesophageal echocardiography with surgical or pathological validation. *American Heart Journal.* 2006.
3. Barkhausen J, Hunold P, Eggebrecht H, Schuler WO, Sabin GV, Erbel R, Debatin JF. Detection and characterization of intracardiac thrombi on MR imaging. *AJR Am J Roentgenol.* 2002.
4. Mollet NR, Dymarkowski S, Volders W, Wathiong J, Herbots L, Rademakers FE, Bogaert J. Visualization of ventricular thrombi with contrast-enhanced magnetic resonance imaging in patients with ischemic heart disease. *Circulation.* 2002.
5. Barkhausen J, Hunold P, Eggebrecht H, Schuler WO, Sabin GV, Erbel R, Debatin JF. Detection and characterization of intracardiac thrombi on MR imaging. *AJR Am J Roentgenol.* 2002.



**Fig. 7.31:** Contrast CT image showing left renal mass and tumour thrombus in IVC



**Fig. 7.32:** Peroperative figure showing tumour

### **Radiological Diagnosis**

Biopsy proven renal cell carcinoma left kidney with now tumour extension through IVC into right atrium.

### **Surgical Intervention**

Patient underwent surgical removal of left kidney and simultaneously removal of right atrial mass and IVC tumour thrombus (Fig. 7.32) peroperative.