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## Arrhythmias, Pacing and Electrophysiology

### The study of spectrum of arrhythmias and imaging findings in granulomatous cardiomyopathy



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**Introduction:** This report characterizes a syndrome of granulomatous infiltration presenting as unexplained ventricular arrhythmias with adenopathy anywhere in body. Patients without obstructive coronary artery disease with significant lymph nodes were evaluated for tuberculosis and sarcoidosis. The aim of our study is to identify the spectrum of clinical manifestations and the various imaging features on different imaging modalities in different types of granulomatous cardiomyopathies and their response to treatment.

**Methods:** It is a retrospective as well as prospective observational study of all patients clinically diagnosed as granulomatous cardiomyopathy and subsequently confirmed by imaging and standard laboratory diagnostic test to have granuloma or granulomatous disease elsewhere in body. Patients having ischemic heart disease were excluded.

**Results:** A total of 9 patients were included with mean age of presentation 47 years. Mediastinal adenopathy with mid-myocardial scar and/or focal myocardial inflammation was observed in 7 patients. None of the patients had symptoms of extracardiac disease. Evidence of tuberculosis was present in 44.4%. The median follow-up was 6 months. 8 patients had mediastinal lymphadenopathy, one had axillary and one had additional extra mediastinal lymphadenopathy.

55.5% were female, 88.8% (8 of 9 patients) had ventricular tachycardia and 11.2% had complete heart block. VT recurred despite initial treatment in 87%. Addition of disease-specific therapy abolished further recurrences in 71% of them.

**Conclusion:** Patients with granulomatous cardiomyopathy usually presents as unexplained ventricular arrhythmias or occasionally atrioventricular nodal block with preserved or compromised ventricular function. It is a syndrome of arrhythmogenic myocarditis with granulomatous lymphadenopathy due to myocardial tuberculosis or cardiac sarcoidosis. This entity is optimally managed with a combination of disease-specific therapy and antiarrhythmic measures.

### Is atrial fibrillation an independent predictor of prosthetic heart valve thrombosis



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**Introduction:** Prosthetic heart valve thrombosis (PHVT) is an uncommon but serious complication of valve replacement. As compared to developed countries where the reported incidence of PHVT ranges from 0.3% to 3% per year, Indian studies have quoted the incidence to be as high as 6% in the initial 6 months of valve implantation. Previous studies have demonstrated variety of risk factors [compliance to oral anticoagulation (OAC), depressed

Baseline Features of patients with unexplained arrhythmias due to Sarcoidosis/Tuberculosis

Patient serial No.	Age (years)	Sex	LVEF (%)	Arrhythmia presentation	Site of adenopathy on imaging	Biopsy diagnosis	Tuberculin skin test	Diagnosis	Disease specific treatment	Antiarrhythmic treatment
1	52	F	C	VT	M	TB	P	TB	ATT	AAD
2	35	M	C	VT	M	S	N	CS	PDN/Mtx	AAD + ICD
3	52	F	C	VT	M	GIUE	P	CS/TB	ATT + PDN/Mtx	AAD
4	42	F	C	VT	M	S	N	CS	PDN/Mtx	AAD + ICD
5	53	M	C	VT	M	S	N	CS	PDN	AAD + ICD
6	39	M	No	CHB	M	s	N	CS	TPI + PDN	-
7	41	F	C	VT	M	GIUE	N	CS/TB	ATT + PDN	AAD + ICD
8	61	F	c	VT	M, C	GIUE	N	CS	PDN	AAD + ICD
9	51	M	C	VT	Axillary	TB	P	TB	ATT	AAD

M – male, F – female, No – normal, C – compromised, VT – ventricular tachycardia, CHB – complete heart block, S – sarcoidosis, TB – tuberculosis, GIUE – granulomatous inflammation of undetermined etiology, M – mediastinal, C – cervical, P – positive, N – negative, ATT – antituberculous therapy, CS – cardiac sarcoidosis, PDN – prednisolone, Mtx – methotrexate, AAD – antiarrhythmic drug, ICD – implantable cardioverter defibrillator.

**Table 1**

Baseline characteristics	n = 33
Age (mean $\pm$ SD), years	39 $\pm$ 12
Sex (M:F)	20:13
Valve at mitral position	28
Valve at aortic position	8
Time duration since valve replacement (months, range)	34 (4–240)
LA diameter in mm (mean $\pm$ SD)	44 $\pm$ 16
Patients with AF [n (%)]	24 (72%)
LVEF (%)	58 $\pm$ 6%
Compliance to OAC, n (%)	6 (25%)

left ventricular ejection fraction (LVEF), valve prosthesis type and position of valve, chordal preservation surgery, atrial fibrillation (AF), left atrial (LA) size] as predictor to PHVT and the outcome of management by thrombolysis. In the current study, we intend to evaluate whether AF is an independent predictor of PHVT.

**Methods:** We prospectively collected data of all patients presenting to our out-patient, in-patient and emergency room of department of cardiology. All baseline parameters (demographic characteristics, compliance to OAC, LVEF, valve prosthesis type and position of valve, AF and LA size) were noted and were subjected to univariate and multivariate analysis to determine their association to PHVT.

**Results:** Since June 2013 to June 2015, 33 patients (20 female, 13male) with PHVT were admitted to our department. Baseline characteristics are shown in Table 1.

Mean age of patients presenting with PHVT was 39  $\pm$  12 years, with females accounting for 2/3rd of the all PHVT patients. A total of 36 valves were thrombosed in 33 patients. Mitral valve was affected in 28 patients and 8 patients had thrombosis of aortic valve. Mean time duration after valve replacement till presentation with PHVT was 4 (range 4–240) months. Mean LA diameter at was 44  $\pm$  16 mm. 24 (72%) of patients were in AF and overall the LVEF was almost normal in all patients. Only 9 (25%) of patients were compliant to the OAC prescribed.

Overall the most predominant cause of PHVT is non-compliance to OAC.

**Conclusion:** Because of the inadequate number of patients with PHVT, multivariate analysis could not be done to determine the significance of association of risk factors to PHVT. Overall non-compliance to OAC appears to be the most important cause of PHVT. AF in association is found in 72% of patients.

## Common problems of a common arrhythmia – Atrial fibrillation



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**Background:** Stroke is a serious complication of atrial fibrillation (AF) and oral anticoagulants are effective in reducing the risk of stroke. New oral anticoagulants (NOAC's) are available now as alternatives.

**Aims:** (1) To study the clinical profile of patients with AF and attendant problems, (2) to assess the risk of stroke and bleeding in patients with non valvar AF (NVAf) and (3) to study the frequency of usage of vitamin K antagonists (VKA) and NOACs and their attendant problems.

**Methods:** All consecutively hospitalized patients with AF and those patients with AF seen in cardiology OPD were included in this observational prospective registry study. CHA2DS2-VASc and

HASBLED scores were applied in patients with NVAf. Renal function was assessed by Cockcroft–Gault formula.

**Results:** Of 106 patients, 56 (52.83%) were males and 50 (47.17%) were females. The mean age was 64.67 years. 31 (29.24%) patients had valvar AF, and 75 (70.76%) NVAf. 16 (15.09%) patients had stroke. 51 (48.11%) had hypertension, 23 (21.69%) had diabetes, 21 (19.81%) had coronary artery disease, 5 (4.71%) had cardiomyopathy, 18 (16.9%) were detected to have thyroid dysfunction and 7 (6.6%) chronic kidney disease.

The mean CHA2DS2-VASc score was 3.54, and HASBLED score was 2.11. Of 31 patients of valvar AF, 27 received VKA and 4 patients took no anticoagulants. Out of 75 patients with NVAf, 17 received NOAC, 29 were on VKA (26 refused NOAC due to cost constraint and 3 had creatinine clearance <30 ml/min) and 29 on antiplatelets (CHADS score 1 or less in 5 and 24 unwilling to take anticoagulant). 3 switched to NOAC from VKA, and 1 opted to switch from NOAC to VKA. Of 56 patients who were on VKA, 4 had hemorrhagic stroke. 6 patients died. No significant adverse effects were reported with NOACs except one patient developed hematuria. VKA were associated with increase risk of hemorrhagic stroke.

**Conclusion:**

1. NVAf was more frequent than valvar AF.
2. Antiplatelets are still being used inappropriately.
3. NOACs are attractive alternatives to VKA, but are expensive.

## Ventricular tachycardia in viral myocarditis managed by catheter ablation: A rare case report



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The combination of ventricular tachycardia (VT) and severe left ventricular dysfunction presents a serious challenge in management of acute fulminant myocarditis (AFM). We present a case of a 52-year-old male with AFM, who presented with hypotension and incessant VT not responsive to pharmacological therapy. He underwent successful catheter ablation.

**Introduction:** Myocarditis is clinically and pathologically defined as “inflammation of the myocardium”. Clinical presentations of the disease range from nonspecific systemic symptoms (fever, myalgias, palpitations, or exertional dyspnea) to fulminant hemodynamic collapse and sudden death. Furthermore, it has been identified as a cause of dilated cardiomyopathy in 9% of cases in a large prospective series. Endomyocardial biopsy and autopsy findings have clearly demonstrated that myocarditis represents a frequent cause of life-threatening ventricular arrhythmias and sudden death.

Electroanatomic mapping allows operators to record intracardiac electrical activation in relation to anatomic location in a cardiac chamber of interest, even during arrhythmia mapping. Although use of electrophysiological ablation in AFM has not been documented widely, in exceptional cases where VT is not responding to conventional treatment ablation remains a useful alternative.

**Case:** A 52-year-old male known case of hypertension and diabetes mellitus since last 10 years had a history of traveling in last 15 days following which he started experiencing fever and breathlessness. Further, he developed swelling over his feet, abdomen and face for which he admitted in a private hospital where he was managed medically. But his condition went on deteriorating and he had incessant VT for which he was given around 20 DC shock and was intubation and IABP was inserted. 2D Echo was done which showed global LV hypokinesia with ejection fraction of 25–30%. He was diagnosed to be suffering from viral myocarditis and was