Healthy Heart

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Honorary Editor :
Dr. Ajay Naik

From the desk of Editor:

Ventricular Tachycardia (VT) is a life threatening complication. The management becomes extremely challenging when it is refractory to traditional anti-arrhythmic drugs. Herein, we describe a case where a 33-year-old patient with VT storm, with an implantable cardioverter defibrillator (AICD), was managed by medications, sedation, ventilator support and multiple Radio-Frequency (RF) ablation procedures over 76-days ICU stay period.

The most crucial issue in our country is financial strain, social and family problems due to hospitalization of patients with life threatening illnesses.

In this patient we were able to the curtail the expenses to ***under 10 lakhs despite the 2 ½ months ICU stay, multiple RF ablations with advanced mapping systems. Also, we could support the family in our CIMS dormitory and our unique hospice care.***

- Dr. Ajay Naik

Ventricular Tachycardia (VT) storm in Cardiac Sarcoidosis: A 76-day-ICU-Nightmare

Case Presentation

A 33-year-old man was incidentally detected to have Premature Ventricular Contractions (PVCs) during annual health check-up. There were no other remarkable features in electrocardiogram (ECG) or echocardiogram (LVEF 60% and no Right Ventricular disease) in January 2011. Following month, the patient was admitted with palpitations and presyncope, diagnosed as sustained VT, which was alleviated with direct current (DC) cardioversion, IV Amiodarone and Beta blockers. Detailed investigations were performed including contrast enhanced computed tomography (CECT) of chest, cardiac MRI, followed by Endoscopic ultrasonography guided fine needle aspiration cytology (FNAC) which were all suggestive of **sarcoidosis;** therefore steroid immunosuppressive therapy was started.

In June 2011, the patient once again experienced palpitations (diagnosed as **sustained rapid monomorphic VT), DC cardioversion** was performed. Echocardiogram demonstrated left ventricular ejection fraction **(LVEF) of 15%, LVDd of 64mm, LVDs of 58mm,** and grade II mitral valve regurgitation. Dual chamber implantable cardioverter defibrillator (AICD) was implanted and patient was treated with beta blockers, Lidocaine and Amiodarone. Despite anti-arrhythmic drugs (AAD), the patient had **recurrent VT treated successfully by AICD with 12 shocks in 24 hours.** He was intubated and placed on ventilator support, sedated. In addition to AAD, IV Magnesium sulphate and Metoprolol infusions were started. The patients was then weaned off the ventilator after 3 days and transferred to our institute via airplane, during the transfer he received shocks from AICD. Management during ICU stay is described in table.

Pathology

Sarcoidosis is characterized by a systemic collection of noncaseating

granulomas involving any organs like the lymph nodes, lungs, skin, eyes, etc. and associated immunologic abnormalities. Although environmental and genetic factors have been implicated in its pathogenesis, the etiology of cardiac sarcoidosis remains obscure. One-half to two-thirds of patients with significant cardiac sarcoidosis die suddenly and VT is presumed to be the cause of the sudden death in most.

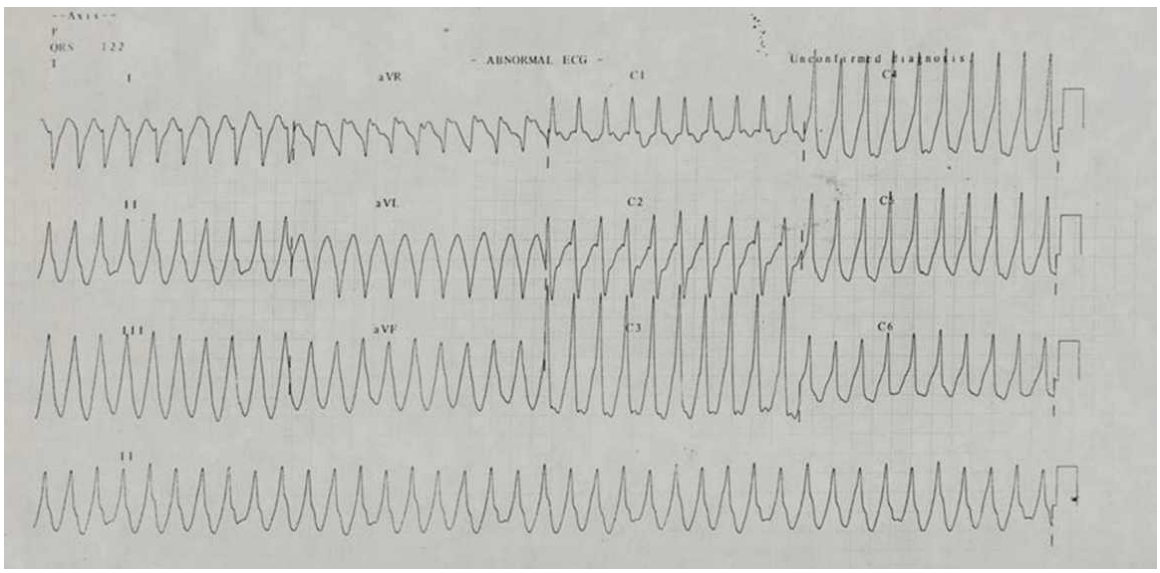

Figure 1: 12 Lead Electrocardiogram showing VT morphology 1

Management	
On Admission	◆ Patient had recurrent non-sustained ventricular tachycardia (NSVT) and polymorphic VT with QT prolongation. ◆ Implantable cardioverter-defibrillator was reprogrammed with more aggressive ATP to reduce the number of shocks. ◆ He was intubated and put on ventilator support. ◆ Sedation maintained with IV fentanyl, IV morphine and IV midazolam intravenously. ◆ Cervical sympathetic block was given with sensorcaine. ◆ Chemotherapy with IV cyclophosphamide was started in addition to IV methyl prednisolone.
Day 4	◆ Polymorphic VT had subsided; however, frequent monomorphic VT were observed with 3 different morphologies causing frequent shocks >10/day despite the aggressive anti-tachycardia pacing (ATP) programming.
Day 6	◆ 3 morphologies (interchanging repeatedly) of VT (Figure 1 shows VT1 morphology) were identified using electro-anatomical mapping (CARTO Biosense System).

	Morphology	Cycle length	BPM	Localization
VT1	RBBB Inferior axis	460	130	LVOT region
VT2	LBBB Inferior axis	500	120	RVOT septum
VT3	LBBB left axis	550	110	RV mid septum

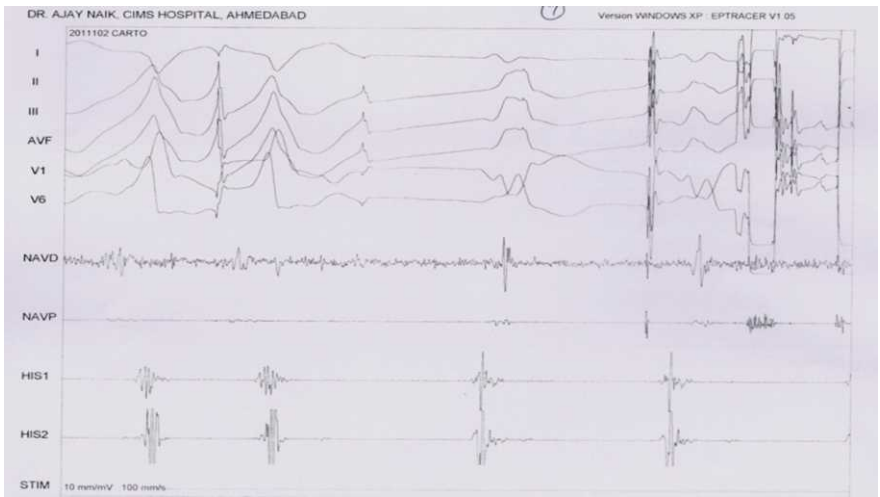

Figure 2a: VT1 termination during RF ablation

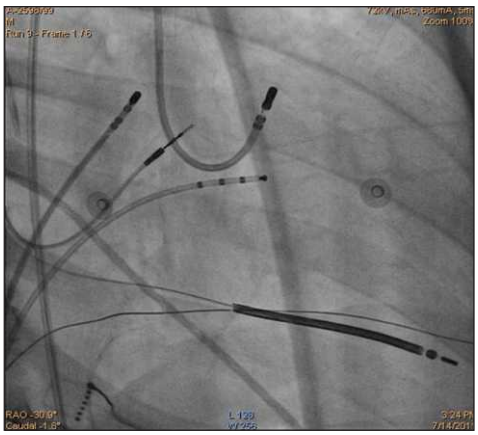

Figure 2b: Successful sites of RF ablation of VT 1(View of RAO)

	◆ Extensive Theromocool RF ablation (Figure 2) performed, almost contiguous from LVOT to RVOT and RV mid-septum, at band of fractionated electrograms corresponding to basal septum scar in MRI
Days 7-10	◆ Longer episodes of VT occurred resulting in frequent shocks
Day 11 (5 days post EPS1)	◆ EPS2 was conducted (Conventional System), where both VT2 and VT3 were easily inducible. ◆ Repeat ablation was performed in RVOT region extending down to RV mid-septum. ◆ Post ablation, VTs were not inducible but patient had residual RBBB.
Days 12-18 (1 week post EPS2)·	◆ ECG recording showed frequent PVCs, occasional NSVT but no sustained VT. ◆ DDD pacing was reduced to 120 bpm. ◆ Patient was taken off IV medications and sedation. ◆ High dose of Metoprolol (>200mg/day) and Fentanyl Patch were continued.
Days 19-22	◆ Recurrent NSVTs starting at 5am were observed (No signs and symptoms of obstructive sleep apnea or desaturations were noticed).
Day 23 (13 Days after EPS2)	◆ Demonstrated frequent VTs again causing frequent ATPs and shocks; repeat ablation performed with CARTO Biosense (Figure 3 shows electroanatomical mapping of RV and LV with the CARTO system)

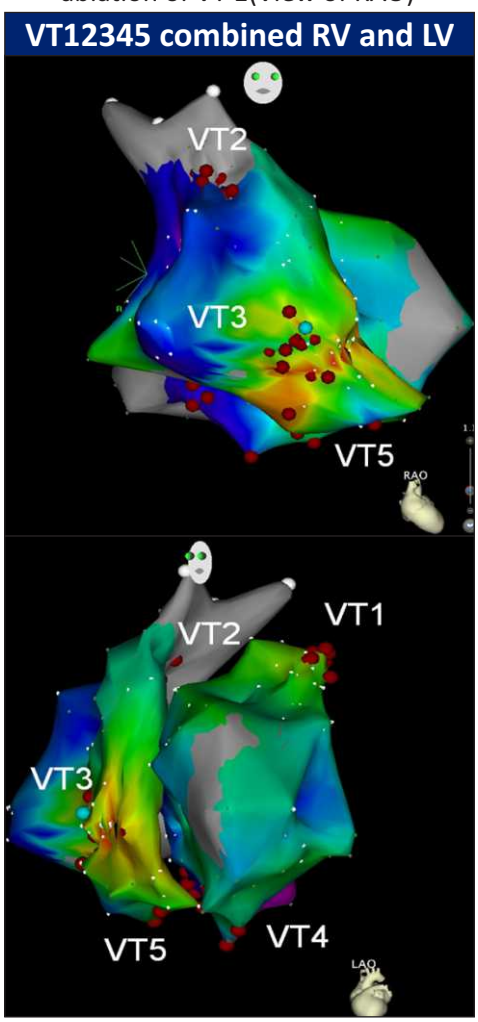

Figure 3: Electroanatomical mapping of RV and LV with the CARTO system

	◆ Morphologies of VTs were different than previously observed				
		Morphology	**Cycle length**	**BPM**	**Localization**
		VT4 RBBB left superior axis	330	180	Left inferior septum
		VT5 LBBB left superior axis	330	180	RV inferior septum
	◆ Extensive ablation was performed (thinned out IVS, 3mm on echo)Days 24-37 (2 weeks post EPS3)				
Days 38-76 (2 week post EPS2)	◆ Patient was deeply sedated for 72hrs; gradually the sedation was weaned off ◆ Frequent PVCs, occasional NSVT noted, rates maximum 140 bpm, no additional shocks by AICD				
Days 38-76	◆ No shocks by AICD ◆ ATP 4 occasions, for VT 140bpm ◆ DDD pacing was reduced to 115bpm				

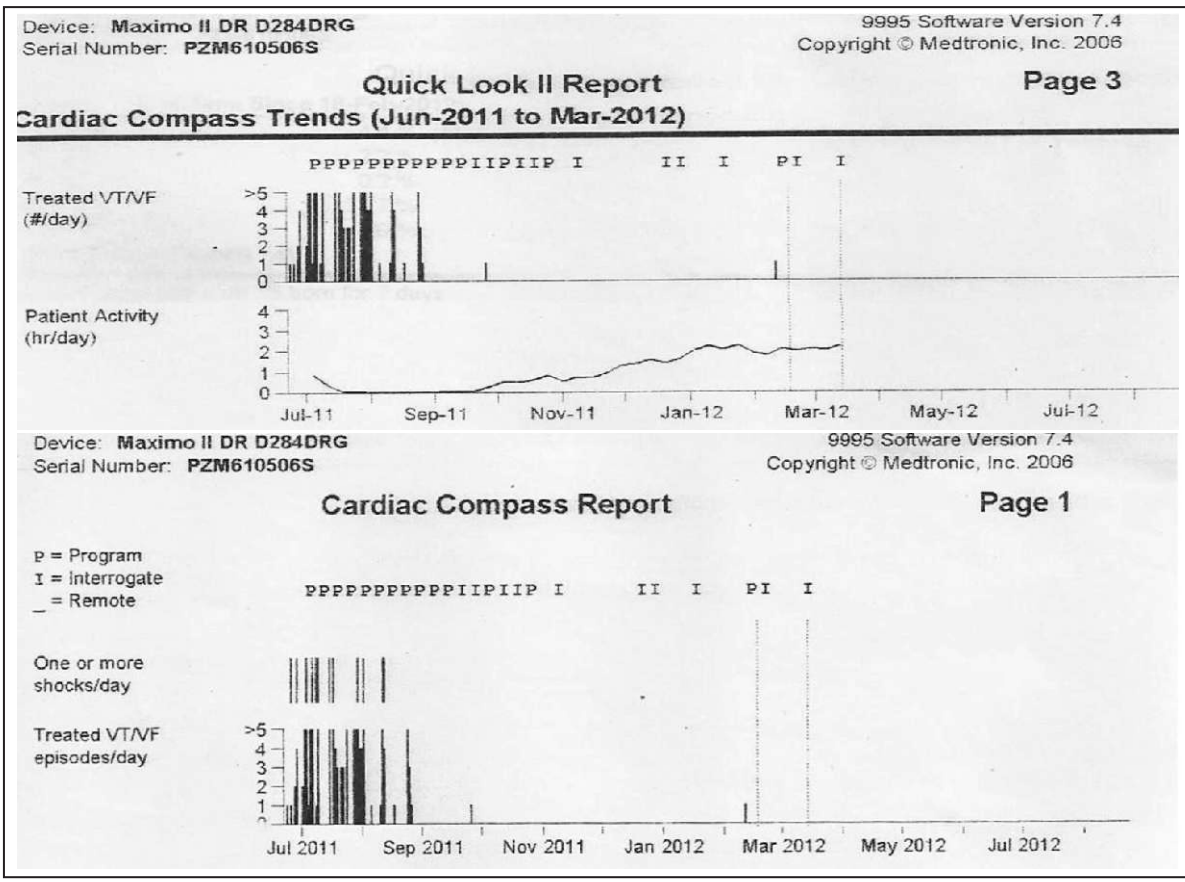

Figure 4: Cardiac compass report

Patient was observed and finally discharged after 76 day of ICU stay. The echocardiogram findings demonstrated LVEF of 15%, dilated Left Ventricle and thinned out myocardium. During the follow-up (6 months post discharge), patient was performing reasonably well, with LVEF of 25-30%, less frequent non-sustained VT and only one shock from AICD. (Figure 4 shows cardiac compass trends of the patient)

In conclusion, in the present case of a patient with Sarcoidosis and cardiac involvement, multiple sessions of radiofrequency catheter ablation of VT refractory to immunosuppressive therapy, was effective in controlling the VT storms.

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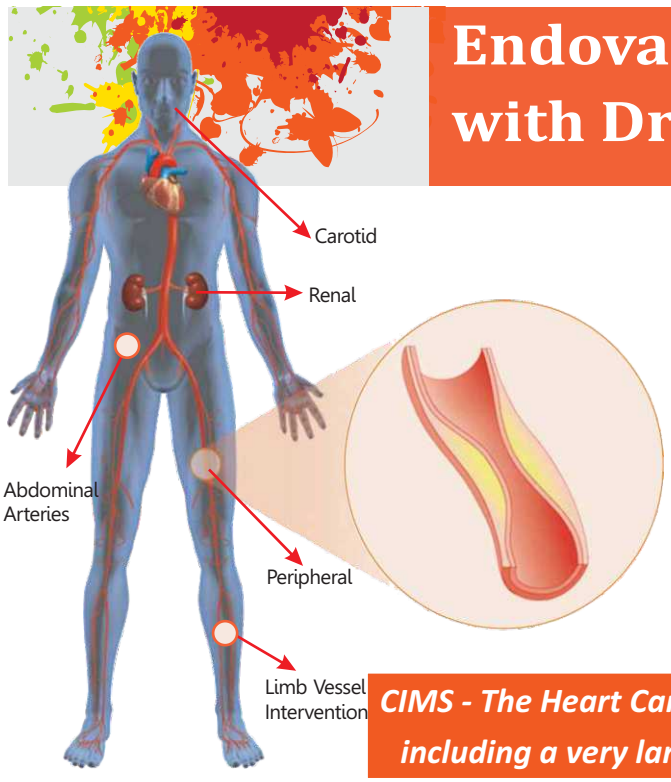
Endovascular Peripheral Workshop with Dr. Ashit Jain

August 31 - September 1, 2012



Dr. Ashit Jain is a well known Interventional Cardiologist practicing for the past 20 years in California, USA. Graduated from University of Delhi, completed Fellowship in Interventional Cardiology and Peripheral Vascular Disease at Ochsner Medical Center in New Orleans, USA, he has developed an extensive clinical research program at Washington Hospital in Fremont, California and is involved in multiple new device research technologies. He has also served as site principal investigator on over 26 multi-center clinical research trials and has written and presented many abstracts and publications in the field. A pioneer in Carotid Interventional Programs in the San Francisco Bay area, he is affiliated with five hospitals in the East Bay of San Francisco and has personally performed over 500 carotid interventions.

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- Venous Thromboembolic Disease
- Thoracic Abdominal Aortic Aneurysms
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- Catheter-Based Interventions for Failing Hemodialysis Accesses
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- Intracranial Arterial Stenotic Disease
- Vertebral Arterial Disease

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Daily screening camp of the concerned patients is being held from June 15, 2012 onwards at CIMS Hospital. Time : 2.00 pm - 6.00 pm

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Entrance Test

It will be conducted for the selection of the candidates assessing overall reasoning and aptitude.

(For details of tuition fees and entrance test, visit www.gfsu.edu.in)

Important dates

- Entrance exam: **July 29, 2012, Time : 11.00 am, Venue : GSFC Campus**
- Publication of merit list : **July 31, 2012**
- Commencement of semester : **August 5, 2012**

For any queries, please contact : +91-9409539004 email: anjani.patel@cimshospital.org

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