Moderator band VT

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Clinical Presentation

- Thirty two year old male presented with recurrent pre-syncope and palpitations.
- ECG showed VPCs with LBBB and LAD with late transition after V4.
- 24 Hr Holter showed frequent VPCs and NSVT and couplets and triplets with 42% VPCs load.
- Echo showed structurally and functionally normal heart.
- MRI of heart showed no late gadolinium enhancement.
- PET CT was done by Dr. Narsimhan Sir. which was normal.
- Put on Amiodarone 200 twice daily along with Metoprolol 25 mg twice daily.
- Repeat Holter after 3 weeks of medications VPCs reduced to 5%.
- Patient is asymptomatic on medical therapy.
- He did not agreed for EPS and RFA. Recommended for ICD implantation.
PHILIPS

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PATIENT DEMOGRAPHICS

Last Name: MR ANKIT GARWAL
First Name: 
Middle Initial: 
ID Number: 
DOB: 
Sex: M
Source: 30YIM
Billing Code: 
Receiver Format: 
Reason for Test: 
Medication: 

Physician: DR KUMAR 
Reading Physician: MR ASHISH 
Test Date: 3/30/2018
Analysis Date: 3/31/2018
Hookup Time: 3:34 AM
Recording Time: 23 hr 59 min
Analysis Time: 29 hr 59 min
User Field #1: 
User Field #2: 

Heart Rate Data

| Total Beats | 124853 |
| Max HR | 81 BPM at 6:54:23 PM |
| Avg HR | 61 BPM |
| Min HR | 81 BPM |

Heart Rate Variability

| SDANN | 100.6 msec |
| ISOANN | 101.3 msec |
| RMSSD | 155.6 msec |

GT Analysis

| QTc Min | - |
| QTc Avg | - |
| QTc Max | - |
| QTc = 460 msec | - |

VT Episode Analysis

| Ch1 | Ch2 | Ch3 |
| Min ST Level | - | - | - |
| Max ST Level | - | - | - |
| VT Episodes | - | - | - |

Pacem Analysis

| Sinus Beats | - |
| Pacelt Beats | - |
| Single Pacelt Beats | - |
| Dual Pacelt Beats | - |
| Fusion Beats | - |

Ventricular Ectopy

| Total VE Beats | 53104 (44.9%) |
| Vent Runs | 27 |
| Beets | 11 |
| Fastest | 740 BPM at 6:56:06 PM |
| Triplet | 3490 Events |
| Couplet | 1256 Events |
| SingleInter PVC | - |
| R on T | 378 |
| SingleLate VE's | 1262 |
| Q/TImin | - |

Supraventricular Ectopy

| Total SVT Beats | 0 (0.0%) |
| Atrial Runs | 0 |
| Atrial Beets | 0 |
| Atrial Fastest | 0 BPM |
| Atrial Rate | 60 |
| Single PAC's | 0 |
| Single PAC's | 0 |
| Atrial Fibrillation | 0 |

Atrial Fibrillation

| Atrial Beets | 0 (0.0%) |
| Duration | 0.0 min |
| Events | 0 |

INTERPRETATION

24 HRS HOLTER MONITORING OF "MR ANKIT GARWAL" REVEALED:

FINAL COMMENTS:

1. MINIMUM HEART RATE OF 60 BPM, AVERAGE HEART RATE 89 BPM, MAXIMUM HEART RATE 130 BPM.
2. FREQUENT PVC'S/BIGEMINY/TRIGEMINY SEEN.
3. FREQUENT VENTS OF NONSUSTAINED POLYMORPHIC VT'S SEEN.
4. NO SVT/RSVT/VP SEEN.
5. NO ATRIAL FIBRILLATION/FLUTTER SEEN.
6. NO SIGNIFICANT ST-T CHANGES SEEN.
7. NO SIGNIFICANT AV BLOCK/SINUS PAUSE SEEN.

DR RISHI GUPTA  DR SIMMI MANOCHA  DR SUBRAT AKHOURY  DR UMEESH KOHLI
MD, DM, DBN(CARDIO)  MD, DM (CARDIO)  MD, DM (CARDIO)  MD, DM(CARDIO)
DIRECTOR CARDIOLOGY CHIEF IN CARDIOLOGY SR. INTERV. CONSULTANT SR INTERV. CONSULTANT

Signed: 
Date: 
Serial #: 16479
Summary and Conclusion

• The morphology of VPCs suggestive of Moderator band VT. This may degenerate to VF.
• ICD should be recommended for this.
• This VT can be ablated from either septal part of moderator band or lateral part of it at the attachment of MB to anterior papillary muscle of RV.
Idiopathic Ventricular Fibrillation Originating from the Moderator Band

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Idiopathic VF Originating from the Moderator Band. We report a case of a 59-year-old man with idiopathic ventricular fibrillation storm. Ventricular fibrillation was pause-dependent and triggered by an early-coupled right ventricular premature complex. The characteristic premature beat was mapped and successfully ablated from Purkinje fibers of the moderator band. (J Cardiovasc Electrophysiol, Vol. pp. 1-4)

doi: 10.1111/j.1540-8167.2012.02374.x
Figure 2. A: P potentials recorded during sinus rhythm (left) and VPC at the successful ablation site. In sinus rhythm, a discrete potential (P) preceded ventricular activation by 10 milliseconds. During a ventricular premature complex (VPC), the discrete potential (P) preceded the QRS by 35 milliseconds. B: Relationship between the sites of earliest ventricular activation and earliest P potential during ventricular premature complexes. At the base of the papillary muscle, the P potential (P) was recorded 20 milliseconds after the onset of ventricular activation (A). At the middle and distal aspects of the papillary muscle (B and C, respectively), P potentials became progressively earlier and recorded 8 and 6 milliseconds after the onset of ventricular activation. D: The earliest P potential was recorded on the moderator band and preceded ventricular activation by 35 milliseconds. At this site, the local ventricular activation preceded the ventricular activation by 32 milliseconds.
Figure 3. Intracardiac echocardiography image displaying the right ventricular papillary muscle, the moderator band, and the mapping catheter at the moderator band.
Idiopathic ventricular arrhythmias originating from the moderator band: Electrocardiographic characteristics and treatment by catheter ablation

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From the Section of Cardiac Electrophysiology, Cardiovascular Division, Department of Medicine, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.
BACKGROUND The moderator band (MB) can be a source of premature ventricular contractions (PVCs), monomorphic ventricular tachycardia (VT), and idiopathic ventricular fibrillation (IVF).

OBJECTIVE The purpose of this study was to define the electrocardiographic (ECG) characteristics and procedural techniques to successfully identify and ablate MB PVCs/VT.

METHODS In 10 patients with left bundle branch block morphology PVCs/VT, electroanatomic mapping in conjunction with intracardiac echocardiography (ICE) localized the site of origin of the PVCs to the MB. Clinical characteristics of the patients, ECG features, and procedural data were collected and analyzed.

RESULTS Seven patients presented with IVF and 3 presented with monomorphic VT. In all patients, the ventricular arrhythmias (VAs) had a left bundle branch block QRS with a late precardial transition (> V4), a rapid downstroke of the QRS in the precardial leads, and a left superior frontal plane axis. Mean QRS duration was 152.7 ± 15.2 ms. Six patients required a repeat procedure. After mean follow-up of 21.5 ± 11.6 months, all patients were free of sustained VAs, with only 1 patient requiring antiarrhythmic drug therapy and 1 patient having isolated PVCs no longer inducing VF. There were no procedural complications.

CONCLUSION VAs originating from the MB have a distinctive morphology and often are associated with PVC-induced ventricular fibrillation. Catheter ablation can be safely performed and is facilitated by ICE imaging.

KEYWORDS Premature ventricular contractions; Moderator band; Idiopathic ventricular fibrillation; Intracardiac echocardiography; Catheter ablation

ABBREVIATIONS APM = anterior papillary muscle; ECG = electrocardiogram; EGM = electrogram; ICD = implantable cardioverter-defibrillator; ICE = intracardiac echocardiography; IVF = idiopathic ventricular fibrillation; LBBB = left bundle branch block; LV = left ventricle; MB = moderator band; PF = Purkinje fiber; PVC = premature ventricular contraction; RB = right bundle; RBBB = right bundle branch block; RV = right ventricle; TTE = transthoracic echocardiography; VA = ventricular arrhythmia; VF = ventricular fibrillation; VT = ventricular tachycardia

(Heart Rhythm 2014;0:0–9) © 2014 Heart Rhythm Society. All rights reserved.
Figure 1  The moderator band crossing from the septum to the free wall of the right ventricle and supporting the anterior papillary muscle of the tricuspid valve.
AMV = anterior mitral valve; Ao = aorta; APM = anterior papillary muscle; IPM = inferior papillary muscle; LV = left ventricle; MB = moderator band; RVOT = right ventricular outflow tract. Reproduced from McAlpine, 1975° with courtesy from the UCLA collection.
Figure 2  Twelve-lead morphology of the moderator band premature ventricular contraction in 10 patients. Note the left superior axis and the late precordial transition (> V4).
Figure 3  Simultaneous recording of the premature ventricular contraction (PVC) morphology on 12-lead ECG (A) and device electrogram (B). This morphology is then matched to the clinical PVC initiating the arrhythmia episode (C, D), thus confirming the 12-lead morphology of the PVC initiating ventricular fibrillation (red star).
Compartmentalized Structure of the Moderator Band Provides a Unique Substrate for Macroeceentrant Ventricular Tachycardia

BACKGROUND: Papillary muscles are an important source of ventricular tachycardia (VT). Yet little is known about the role of the right ventricular (RV) endocavity structure, the moderator band (MB). The aim of this study was to determine the characteristics of the MB that may predispose to arrhythmia substrates.
EDITORIAL COMMENTARY

PVCs arising from the moderator band: An under-recognized trigger for idiopathic VF?

Andrea M. Russo, MD, FACC, FHRS

From the Cooper Medical School of Rowan University, Camden, New Jersey.
Case Report

Ventricular Tachycardia Originating from Moderator Band: New Perspective on Catheter Ablation

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Figure 1: Twelve-lead ECG of IVT.
Figure 2: (a) Pacing mapping showed that the morphology of pacing QRS complex is identical to the QRS complex of clinical IVT (inside the red box). (b) A complex fractionated, high frequency potential with long duration of 57 milliseconds, preceding the QRS onset of the IVT by 23 milliseconds. (c) A conduction block of Purkinje potential (red arrow) was observed during the sinus rhythm after successful ablation during the first procedure.
Figure 3: (a) Ablation catheter at the earliest activation site on the MB using fluoroscopy. (b) Electroanatomic mapping showed that the ablation zone (red points) was placed at the site of earliest activation at the middle RV of lower septum. (c) Ablation at the earliest activation site on the MB (red arrow) guiding by TTE; the ablation catheter (yellow arrow) was placed at the septum insertion of MB. RAO: right anterior oblique; LAO: left anterior oblique.
Thank You