

A new sternal patch ambulatory ECG monitor differentiates outflow tract PVC from non-outflow tract PVCs

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Introduction: Patients with idiopathic PVCs associated with symptoms or PVC induced cardiomyopathy are frequently referred for consideration of ablation. The 12 lead ECG morphologic features of RV outflow tract and LV outflow tract PVCs have been well characterized but many times a 12 lead ECG of the PVC is not available at the time of consultation.

Aim: We evaluate the utility the Carnation Ambulatory Monitor, a new sternal patch ambulatory ECG monitor (CAM) in differentiating RVOT/LVOT PVCs from PVCs from other sites of origin. This novel AECGM is placed vertically on the sternum and provides an aVF electrocardiogram.

Methods: 148 consecutive patients who had a CAM ordered in an outpatient cardiology clinic were screened. 20 patients with >5% monomorphic PVCs recorded on the CAM with a 12 lead ECG of the PVC or who had the PVC site of origin mapped and ablated in the EP lab were included in the study. PVCs recorded on the CAM from the RVOT or LVOT (Group 1) were compared to PVCs from other sites of origin (Group 2). Patients with multiple PVC morphologies were excluded.

Results: Average age was 63.2 years, 11 were men. Mean LVEF = 48%.

Group 1 was comprised of 12 patients with 6 undergoing EPS and mapping and the other 6 by recognized by characteristic left bundle inferior axis 12 lead ECG.

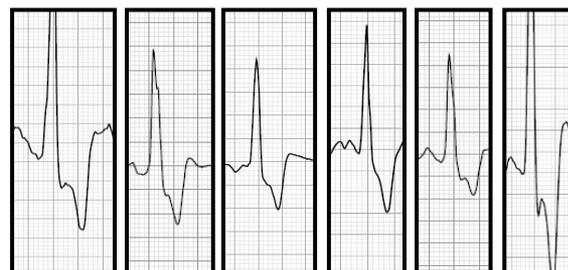
Group 2 was comprised of 8 patients (7 patients with PVC on 12 lead ECG with RB morphology and 1 patient with a left bundle superior axis). Four with a superior axis and 4 with an inferior axis.

A PVC with a monophasic R wave on the CAM was present in 12/12 patients in group 1 and 1/8 patients in group 2. The 1 patient in group 2 with the tall monophasic R wave on CAM had a RB inferior axis PVC on 12 lead ECG. This 12 lead ECG pattern is consistent with a site of origin from the Aorto-mitral continuity (AMC). The remaining Group 2 patients had a PVC morphology with an S (n=4) or R/S (n=2) PVC morphology on the CAM monitor.

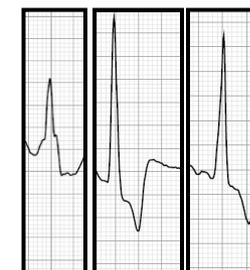
Conclusion:

- A Tall monophasic R wave on the Carnation Ambulatory ECG Monitor differentiates idiopathic outflow tract PVCs from PVCs from other sites of origin.
- This finding provides important clinical insights to PVC site of origin when a 12 lead ECG of the PVC is not available. This may determine whether or not to proceed to catheter ablation vs. more aggressive attempts at drug therapy.

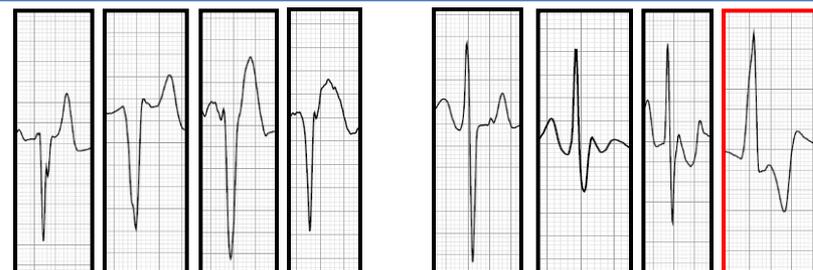
Group 1 RVOT (examples)



Group 1 LVOT



Group 2 PVCs

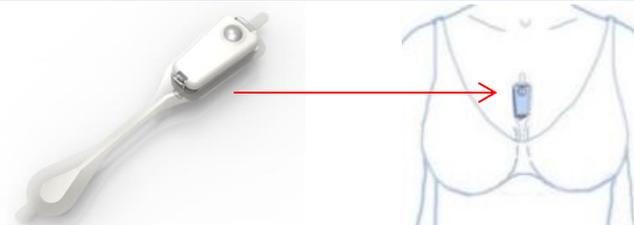


Mid cavity LV septum

Mid cavity Ant LV AMC

Superior axis

Inferior axis



Sternal location of the CAM monitor and electrode spacing [hybrid ECG of V1 + aVF]