Impact of a predefined pacemapping protocol for ablation of infrequent premature ventricular complexes: a prospective, multicenter study

Jauregui B.[1]; Penela D.[1]; Fernandez-Armenta J.[2]; Acosta J.[3]; Teres C.[1]; Ordonez A.[1]; Soto-Iglesias D.[1]; Silva E.[2]; Chauca A.[1]; Carreno JM.[1]; Scherer C.[1]; Pedrote A.[3]; Berruezo A.[1]

[1]Teknon Medical Centre, Heart Institute, Barcelona, Spain
[2]UNIVERSITY HOSPITAL PUERTA DEL MAR, Cadiz, Spain
[3]University Hospital of Virgen del Rocio, Seville, Spain

Funding Acknowledgements: Type of funding sources: None.

Background: Pacemapping (PM) is a useful maneuver for aiding PVC ablation procedures, but its stand-alone clinical value when activation mapping is precluded is still to be defined.

Objectives: To analyze the clinical efficacy of a predefined PM protocol to be applied during low-burden premature ventricular complex (PVC) ablation procedures, regardless of their site of origin (SOO) and the presence of prior structural heart disease (SHD).

Methods: Prospective, non-randomized, multicenter study including 185 consecutive patients referred for a first PVC ablation. A predefined PM protocol was performed to guide ablation whenever a burden < 1 PVC/min was found after a 15-min waiting period, which precluded activation mapping. PM was performed using the PASO module of CARTO3 navigation system, obtaining a correlation grading, color-coded map. A minimum correlation of 94% was required for classifying an area as the PVC-SOO. After identifying the SOO, a high-density PM map with a fill threshold set to 6 was performed and ablation was delivered to the 'target area', defined as the area delimited by the 3 best matching points above the minimum correlation of 94%. Three RF applications were systematically applied in the target area with appropriate parameters: 40 W for the RVOT and aortic root, 50 W for the subvalvular LVOT, 20-30 W in the distal coronary sinus, at operator's discretion in other locations. Clinical success was defined as a PVC-burden reduction of ≥ 80% in the 24-h Holter after 6 months.

Results: 105/185 patients (57%) could undergo activation mapping, while 60/185 (32%) had to be PM-guided. Only 20 patients (11%) had to be canceled due to complete absence of PVCs. Baseline QRS, PVC burden and an OT origin were independent predictors of the need to undergo a PM-guided ablation. The most frequent SOO locations were RVOT (44%), LV (23%), and LVOT (16%), with a significantly higher proportion of RVOT-SOO in the PM group (52% vs. 40%, p = 0.03). The mean target area was 0.6 ± 0.9 cm2, with a mean smallest PM correlation within that area of 95 ± 4%. The mean 10-ms isochronal area in LAT-guided procedures was significantly higher than the PM target area (1.7 ± 2.3 cm2; p < 0.001). The mean number of PM matching points acquired was 39 ± 21 (range 6 – 98). Mean mapping (29 ± 22 min) and RF (135 ± 124 sec) times were similar both for LAT and PM-guided procedures, with significantly shorter procedure times in the PM group (53 ± 24 vs. 61 ± 26 min; p = 0.04). Clinical success after a 6-month follow-up reached 87% for the PM approach, similar to that of LAT mapping-based ablation procedures (90%; p = 0.58).

Conclusions: When LAT mapping is precluded by a very low PVC burden in unselected patients referred for PVC ablation procedures, a first-line, stepwise PM and ablation protocol directed to a target area with > 94% matching correlation is a feasible alternative, reaching comparable clinical results regardless of the PVC-SOO and the presence of SHD.

Abstract Figure. Example of a predefined PM protocol