A NOVEL SIMPLIFIED APPROACH TO RADIOFREQUENCY CATHETER ABLATION OF IDIOPATHIC RIGHT VENTRICULAR OUTFLOW TRACT PREMATURE VENTRICULAR CONTRACTIONS

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Background and aims

Ablation of premature ventricular contractions (PVCs) is based on activation mapping. This strategy is impaired by the absence or paucity of PVCs on the day of the procedure.
Pace mapping as alternative approach has lower spatial resolution[1] 1.8 ± 0.6 cm^2 vs 1.2 ± 0.7 cm^2.
In the presence of low PVC burden in the day of the procedure the success may be reduced from 85% to 56%[2].
Frequently, in sinus rhythm (SR) isolated diastolic potentials (DP) are present at the successful ablation site, although their meaning is still a matter of debate[3].

Purpose

We intended to study a simplified approach based on mapping of DPs for ablation of idiopathic right ventricular outflow tract (RVOT) PVCs in patients that present with a low PVC burden during the procedure.

Methods

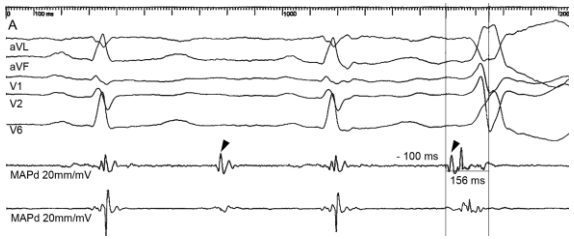
POPULATION

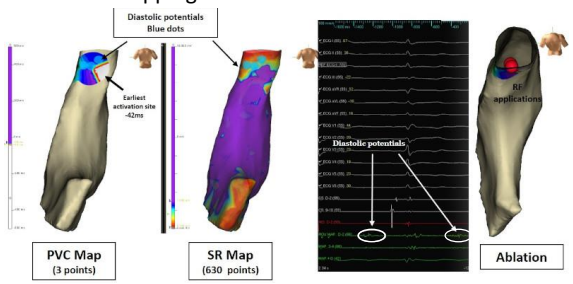
10 consecutive patients referred for ablation of frequent (>10000/24 hours) idiopathic PVCs from the RVOT that present with less than 2 PVCs/min in the beginning of the procedure.
10 controls without PVCs.

MAPPING AND ABLATION

Ablation was based on fast mapping of the RVOT in SR looking for DPs, defined as isolated small amplitude potentials occurring after the T wave of the surface ECG in SR[3].

The area with DPs was marked and a reduced activation mapping of the PVCs was done in the area.





EVALUATED PARAMETERS:

- Procedure, mapping, fluoroscopy and radiofrequency (RF) application times.
- Number of points used for the maps
- Area of DPs. local activation time and success rate. Values are presented as median (Q_1-Q_3).

Results

Median PVC burden per day 14500 (10400- 22975) PVCs/24 hours
Median number of PVCs during the procedure was 1 (0.1-1.6)/min.
Patients with PVCs and control subjects did not differ in relation to age or gender.
Median age 45 (34-65) years, 6 males in the PVC group and 40 (33-65) years 6 males in the control group, p=0.821 and p=0.231 respectively.

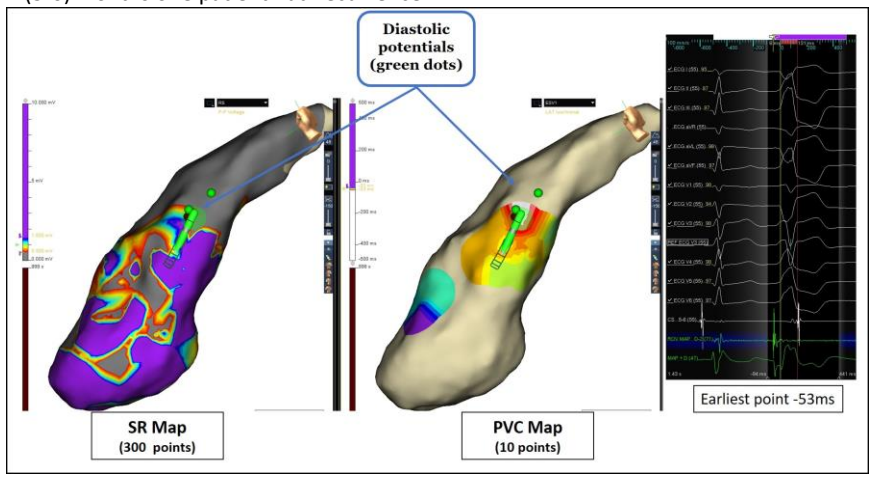
MAPPING AND ABLATION

The number of points sampled per RVOT map in SR was 400 (193-500) in the PVC group and 330 (277-425) in the control group, p=0.539.
All patients in the study group had DPs in the RVOT.
None of the control group subjects had DPs in the RVOT.

Procedure time (min)	Mapping time (min)	Fluoroscopy time (min)	RF time (sec)	Nº points PVC map	Area of DP (cm^2)	Local activation time (ms)
107 (84-132)	30 (19-52)	5.5 (4.3-13)	450 (336-675)	24 (18-31)	2.7 (1.8-6.8)	-39 (-44-49)

ACUTE AND SHORT-TERM FOLLOW-UP

The acute success rate was 100%.
After a median follow-up time of 4 (3-6) months one patient had recurrence.



Conclusion

In these group of patients with very low PVC burden during the procedure, this approach partially based on substrate mapping, made ablation of the PVCs feasible, in a fast and efficient way.

1.Bogun F, et al. Heart Rhythm 2008; 5:339-344
2.Baser K, et al. J Cardiovasc Electrophysiol 2014; doi: 10.1111/jce.12454
3. Parreira L, et al. PLoS ONE 2019 14(2): /doi.org/10.1371/journal.pone.0211232