

SINUS RHYTHM ENDOCARDIAL MAPPING FOR CHANNELS' IDENTIFICATION IN ISCHEMIC VENTRICULAR TACHYCARDIA USING A MODIFIED ELECTROPHYSIOLOGICAL TRIAD

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Introduction

- In a previous study it was demonstrated that an electrophysiological triad was able to identify critical isthmus in atrial flutter (AFL) patients.
- This triad is based in the Carto® electroanatomical mapping (EAM) version 7, which displays a histogram of the local activation times (LAT) of the tachycardia cycle length (TCL), in addition to the activation and voltage maps.

Purpose

- To prospectively assess the ability of a modified electrophysiological triad to identify and localize the ventricular tachycardia's (VT) channels and entrance zones during sinus rhythm mapping.

Methods

- Prospective analysis of a unicentric registry of individuals who underwent ischemic VT ablation with Carto® EAM, all in sinus rhythm.
- All patients with non-ischemic etiology, lack of high-density EAM or lack of mapping in any of the left ventricle walls or structures were excluded.
- We assessed the relationship between the pre-valley bar (the LAT histogram bar immediately before the prolonged LAT-Valley) and the channel entrances.

Methods II

- Areas of late potentials and possible channels of re-entry were compared to a modified electrophysiological triad constituted by:
 - **areas of low-voltage (<0.5mV);**
 - **a deep histogram valley (LAT-Valley) with less than 20% density points relative to the highest density zone;**
 - **a prolonged LAT-Valley duration that included 10% or more of the total mapped activation time.**

Results

- A total of 14 patients (14 men, median age 70 IQR 64-78 years) were included.
- All patients presented with ischemic VT and 86% had a previous inferior myocardial infarction.
- The median number of collected points were 1733 (IQR 1363–2729).
- All sinus rhythm maps presented with at least 1 LAT-Valley in the analyzed histograms.
- All arrhythmias were effectively treated after undergoing radiofrequency in the LAT-Valley location, either by blocking the channel entrances or scar homogenization ablation strategy.
- The pre-valley bar in the histogram marked all the channel entrances in the scar borders.
- No patient had relapse after a clinical follow up of over 6 months.

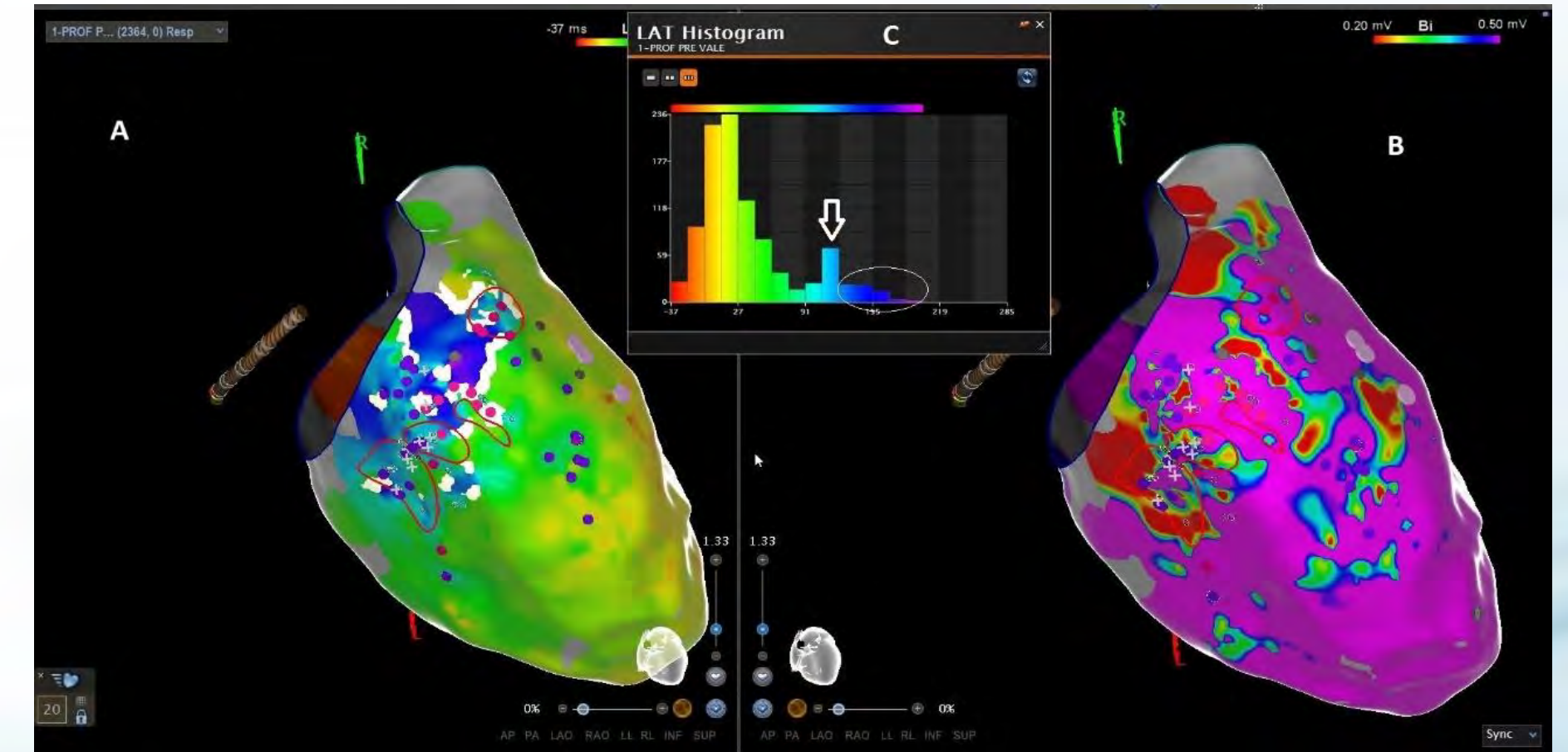


Figure 1: Sinus rhythm activation (A), voltage mapping (B) and LAT Histogram (C). The LAT-Valley (white line) contains the channel. The pre-valley histogram bar (arrow) contains the channel entrances zones (red lines).

Conclusions

- **In a prospective analysis, a modified electrophysiological triad was able to identify the scar channels in sinus rhythm in all patients.**
- **The pre-valley bar in the histogram disclosed the channel entrances.**
- **Further studies are needed to assess the usefulness of this algorithm to simplify catheter ablation and improve clinical outcomes.**