A NEW ELECTROPHYSIOLOGICAL TRIAD FOR ATRIAL FLUTTER CRITICAL ISTHMUS IDENTIFICATION AND LOCALIZATION

Pedro Adragão, MD, PhD; Daniel Matos, MD; Francisco Moscoso Costa, MD; Pedro Galvão Santos, MD; Gustavo Rodrigues, MD; João Carmo, MD; Pedro Carmo, MD; Diogo Cavaco, MD; Francisco Morgado, MD; Miguel Mendes, MD. .
Cardiology and Arrhythmology Department, Hospital de Santa Cruz, CHLO, Lisbon, Portugal.

Introduction

- In a previous retrospective 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

- This study aimed to prospectively assess the ability of an electrophysiological triad to identify and localize the AFL's critical isthmus.

Methods

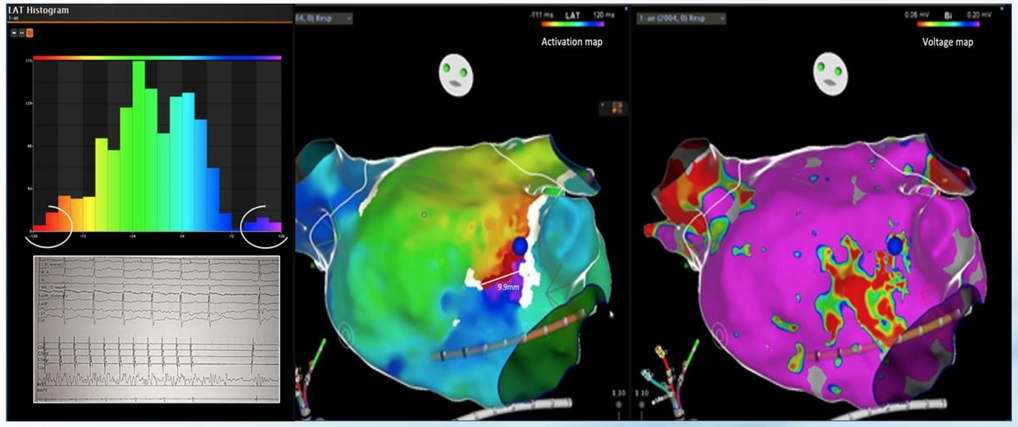
- Prospective analysis of a unicentric registry of individuals who underwent left AFL ablation with Carto® EAM.
- All patients with non-left AFL, lack of high-density EAM, less than 2000 collected points or lack of mapping in any of the left atrium walls or structures were excluded.

Methods II

- Ablation sites of arrhythmia termination were compared to an electrophysiological triad constituted by: areas of low-voltage (0.05 to 0.3mV), sites of deep histogram valleys (LAT-Valleys) with less than 20% density points relative to the highest density zone and a prolonged LAT-Valley duration that included 10% or more of the TCL.
- The longest LAT-Valley was designated as the primary valley, while additional valleys were named as secondary.

Results

- A total of 12 patients (9 men, median age 72 IQR 67-75 years) were included.
- All patients presented with left AFL and 67% had a previous atrial fibrillation and/or flutter ablation.
- The median TCL and number collected points were 250 (230–290) milliseconds and 3150 (IQR 2340–3870) points, respectively.
- All AFL presented with at least 1 LAT-Valley in the analysed histograms, which corresponded to heterogeneous low-voltage areas (0.05 to 0.3mV) and encompassed more than 10% of TCL.
- Eleven of the 12 patients presented with at least 1 secondary LAT-Valley.
- All arrhythmias were effectively terminated after undergoing radiofrequency ablation in the primary or the secondary LAT-Valley location.



- Figure 1: Flutter around an anterior wall scar and a corresponding LAT-Valley (blue, purple, red and orange bars); RF application stopped the AFL (blue tag).

Conclusions

- **In a prospective analysis, an electrophysiological triad was able to identify the AFL critical isthmus in all patients.**
- **Further studies are needed to assess the usefulness of this algorithm to improve catheter ablation outcomes.**