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LAVA sites are histologically closely related to Critical Isthmus sites in Post-Infarct Ventricular Tachycardia

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Abstract:

Introduction

Elimination of low amplitude ventricular activities (LAVA) with catheter ablation portends a better prognosis for post-MI VT. We hypothesised that LAVAs are an intermediary cellular substrate between scar border zone remote to the VT circuit (BZ), and the CI. Using an in vivo swine model of post-MI re-entrant VT we performed a detailed histological analysis of LAVA, BZ and CI sites.

Methods

Domestic pigs (n=15) underwent MI by catheter based LAD balloon occlusion (120 min). VT studies (n=12) were performed 6 weeks post-MI identifying LAVAs, BZ and the CI. Electroanatomic-histological overlay was achieved with epicardial points. Hearts were formalin fixed with histological analyses performed on paraffin embedded tissue.

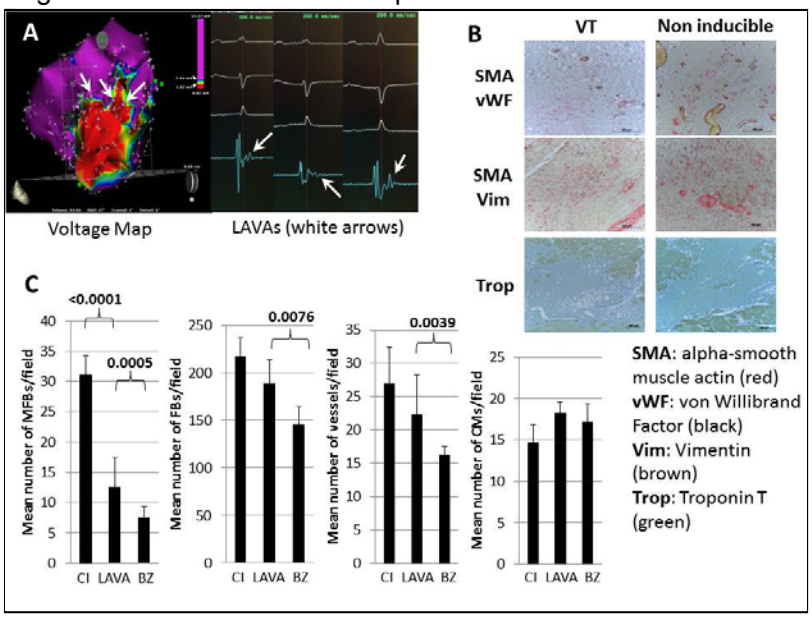
Results

VT was induced in 6/12 pigs. Mapping of LAVAs in VT inducible (VTi) hearts demonstrated a mean of 10$\pm$3 sites/heart compared to 4$\pm$1 sites/VT non-inducible (VTni) hearts. Figure 1A shows representative examples of LAVA potentials with the corresponding histology (B) in VTi hearts compared to LAVAs identified in VTni hearts. The mean densities of myofibroblasts (MFBs), fibroblasts (FBs), vessels and cardiomyocytes (CM) were similar in both groups. LAVA cell profile was compared to CI and BZ sites remote to the VT circuit as shown in figure 1C.

Conclusion

The cellular profile of sites pertaining to LAVAs is intermediary between CI and BZ sites

remote to the VT circuit, consistent with the mechanism whereby LAVA elimination improves ablation outcome. MFB densities were significantly greater than BZ sites remote to the VT circuit however not as 'evolved' as within the CI. The MFB may be a potential target for cell based ablation of post-MI re-entrant VT.



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Author Disclosure Information:

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Category (Complete): 08 Whole Animal Electrophysiology and Pharmacology (includes Neurohumoral Modulation)

Keywords (Complete): V -> Ventricular tachycardia ; A -> Arrhythmias - mechanism ; LAVA, myofibroblast

Additional Information (Complete):

Presentation Preference: Oral or Poster

I am interested in submitting an abstract for one of the Late-Breaking Trials sessions.

: No

At the conclusion of this presentation, attendees will be able to: (Maximum character limit 250)

***Learning Objective:** : define the cellular profile of LAVA sites and understand the potential mechanism whereby complete elimination of LAVAs portends to a better catheter ablation outcome for post-infarct re-entrant VT.

Abstract Awards (Complete):

The Eric N. Prystowsky Early Career Researcher Award : True

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