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### Measurement Of Ventricular Repolarization Using A Novel QDOT-Micro Catheter: A Preclinical Proof Of Concept Study

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#### Abstract:

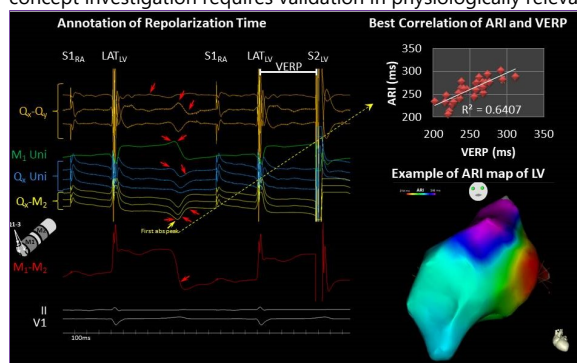
**Background:** Reentrant ventricular tachycardias occur due to local heterogeneity in activation and repolarization. However, clinical substrate mapping techniques only measure activation. This is because measurement of recovery time (RT) requires special catheters with small electrodes pressed against tissue, producing monophasic action potentials (MAP). We hypothesized that a novel catheter with microelectrodes can record electrograms (EGMs) for producing RTs.

**Objective:** To develop a method to measure local RT with a microelectrode catheter.

**Methods:** In 5 healthy swine, the LV was mapped using Carto 3<sup>®</sup> and a novel catheter with 3 distal microelectrodes surrounding the ablation electrode (QDOT-Micro™; Biosense Webster). Unipolar EGMs from all 5 electrodes (M<sub>1-2</sub> and Q<sub>1-3</sub>) were recorded using a 0.5Hz high-pass filter and contact force >5gr. RT was annotated at 12 potential time points and activation recovery interval (ARI) was calculated. All possible EGM configurations were correlated with local VERP.

**Results:** A total of 30 local measurements with corresponding VERPs were made and constituted the basis of this investigation. A bipolar between any of the microelectrodes to the proximal electrode (Q<sub>x</sub>-M<sub>2</sub>) with annotation of the local RT at the earliest T wave peak produced the best ARI correlation to local VERP (R<sup>2</sup>=0.64; Figure). The other 11 unipolar and bipolar configurations yielded suboptimal ARI-VERP correlation.

**Conclusion:** This novel catheter combining contact force with microelectrodes produces EGMs that can be utilized for creation of ARI maps. This proof-of-concept investigation requires validation in physiologically relevant atrial and ventricular substrates..



Author Disclosure Information:

**J. Sroubek:** Nothing relevant to disclose.

**Category (Complete):** Experimental methods

**Keywords (Complete):** R -> Repolarization ; V -> Ventricular tachycardia

**Additional Information (Complete):**

**Presentation Preference:** Oral or Poster

**Proof of Concept/Innovation :** True

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

**\*Learning Objective:** : To understand that the new microelectrode catheter can be used to assess and map local repolarization times in the ventricle. This may facilitate VT substrate characterization.

**Abstract Awards (Complete):**

**Young Investigators Awards (YIA) Competition :** True

**Fellow with the Highest Scoring Abstract Award :** True

**The Eric N. Prystowsky Fellow's Clinical Research Award :** True

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