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**Activity:** Abstract Submission

**Current Date/Time:** 12/9/2019 5:06:50 PM

### Dielectric-based Real-time Imaging Of Radiofrequency Lesion Transmurality: A Preclinical Evaluation

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#### Abstract:

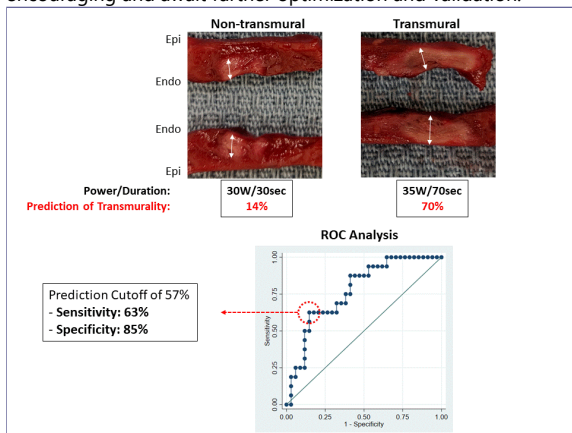
**Background:** Real-time detection of radiofrequency ablation (RFA) lesion transmuralty is desirable. A novel technology based on dielectric imaging from intracardiac signals at multiple frequencies has been developed in effort to provide insights into myocardial wall properties.

**Objective:** Test the accuracy of dielectric imaging-based software for predicting lesion transmuralty.

**Methods:** In 6 swine, the RA, RV and LV were mapped using KODEX-EPD (Philips) and Blazer™ OI catheter (Boston Scientific) and RFA applications were delivered. In order to create transmural and non-transmural lesions, a variety of power (20-40 W) and durations (10-70 sec) were applied. Hearts were harvested, and lesions were dissected for determination of transmuralty by a reviewer blinded to the real-time software measurement. A receiver operator characteristic curve of binary statistics compared software prediction of transmuralty to actual transmuralty.

**Results:** From a total of 55 RFA lesions, 50 (90%) were identified in pathology (RA-25, RV-18 and LV-7). Of the 16 actual transmural lesions, the prediction of transmuralty ranged from 12.8% - 89.2% (mean 55.3% ± 20.2%). Of the 34 non-transmural lesions, the prediction of transmuralty ranged from 1.4% - 98.2% (mean 32.7% ± 25.5%). The overall c-statistic was 0.77 (95% CI 0.64 - 0.91; Figure). At a prediction cutoff of 57%, the sensitivity and specificity of KODEX-EPD to predict RFA lesion transmuralty was 63% and 85%, respectively.

**Conclusion:** In this preclinical feasibility study, dielectric imaging with KODEX provided a reasonable predication to lesion transmuralty. These results are encouraging and await further optimization and validation.



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Author Disclosure Information:

**D. Shim:** Nothing relevant to disclose.

**Category (Complete):** Ablation Techniques

**Keywords (Complete):** A -> Ablation - catheter ; C -> Cardiac mapping

**Additional Information (Complete):**

**Presentation Preference:** Poster Preferred

**Proof of Concept/Innovation :** True

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

**\*Learning Objective :** To learn about new innovations in ensuring optimal ablation delivery

**Abstract Awards (Complete):**

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

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

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