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### 3D Rendered Electromechanical Wave Imaging: A Novel Technique For Localization Of Arrhythmias Prior to Catheter Ablation

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#### Abstract:

**Background:** Localization of the arrhythmia source prior to catheter ablation is based on ECG. Electromechanical Wave Imaging (EWI) is a high frame rate ultrasound technique that can non-invasively localize and visualize myocardial activation in 3D.

**Objective:** Localization of the site of origin prior to ablation can facilitate pre-procedural planning and may reduce procedure times. This study assesses the use of EWI in identifying the locations and origins of various arrhythmias.

**Methods:** 18 patients presented for AFL (n=6), AP (n=7), or PVC (n=5) ablation. Patients underwent transthoracic EWI prior to ablation. Three blinded electrophysiologists reviewed the ECG of each patient and estimated the location or origin. EWI results were compared to the site of successful catheter ablation.

**Results:** Mean age was 49.3±5.0 years and 61% were male. 3D rendered EWI maps were generated for each patient. Three examples are shown in Figure 1. ECG analysis correctly predicted 75% of AFL, 74% of AP, and 60% of PVC locations. Types of AFL predicted by EWI included cavotricuspid isthmus dependent (4), left atrial roof (1) and mitral isthmus dependent (1). AP locations included left lateral (3), anteroseptal (2) and posteroseptal pathways (2). PVC origins included right ventricular outflow tract (3), left anterior papillary muscle (1) and posterior tricuspid papillary muscle (1). The site of successful catheter ablation confirmed 100% of EWI locations.

**Conclusion:** EWI can non-invasively localize a diverse set of arrhythmias such as AFL, APs, and PVCs. EWI may identify locations with greater accuracy than standard ECG interpretation.

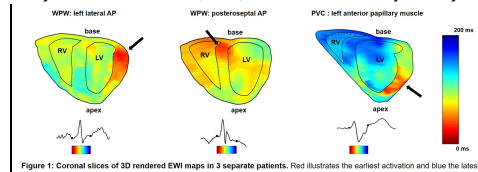


Figure 1: Coronal slices of 3D rendered EWI maps in 3 separate patients. Red illustrates the earliest activation and blue the latest.

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#### Author Disclosure Information:

C.S. Grubb: None. L. Melki (co-first): None. D.Y. Wang: None. J. Peacock: None. J.M. Dizon: None. V. Iyer: None. C.A. Sorbera: None. A.B. Biviano: None. M. Waase: None. R.R. Shah: None. H. Garan: None. E.

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**Presentation Preference:** Oral or Poster

: True

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

**\*Learning Objective:** : Understand the value of Electromechanical Wave Imaging in localizing arrhythmias.

**Abstract Awards (Complete):**

**Status:** Complete

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