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Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

NOVEL 3D NONINVASIVE ULTRASOUND IMAGING LOCALIZES ACCESSORY PATHWAYS IN ADULTS AND ADOLESCENTS WITH WOLFF-PARKINSON-WHITE SYNDROME

Poster Contributions
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Authors: *Christopher Grubb, Lea Melki, Leonardo Liberman, Eric Silver, Carmine Sorbera, Daniel Y. Wang, Vivek Iyer, Rina Shah, Marc Waase, Hasan Garan, Elisa Konofagou, Elaine Wan, Columbia Univeristy Medical Center, Division of Cardiac Electrophysiology, New York, NY, USA, Columbia University, Department of Biomedical Engineering, New York, NY, USA*

Background: Electromechanical Wave Imaging (EWI) is a novel non-invasive imaging modality utilizing high frame rate ultrasound to visualize cardiac electromechanical activation. This is the first study to utilize EWI to localize accessory pathways (AP) in patients with Wolff-Parkinson-White (WPW) syndrome.

Methods: Ten patients with evidence of ventricular pre-excitation on resting EKG underwent transthoracic EWI prior to mapping and catheter ablation. Four clinical electrophysiologists predicted the location of the AP with 12-lead ECG using a standardized segmented template of both ventricles. AP locations predicted by a 3D EWI map and by electrophysiologists were compared to the subsequent catheter mapping. Each arm of the study was blinded to the results of the other.

Results: Mean age was 23.0±3.1 years and 6 were male. Catheter mapping located APs in 10 patients: 3 anteroseptal, 3 posteroseptal, 2 left lateral, 1 left anterolateral, and 1 fasciculoventricular pathway. Interpretation of 12-lead ECG by clinicians using the standardized template correctly identified 72.5±4.8% of the AP locations. EWI using the same template correctly predicted 100% of the AP locations. A representative image is shown in Fig. 1.

Conclusion: EWI is a novel noninvasive imaging tool which may be more accurate than EKG for localization of APs in WPW syndrome.

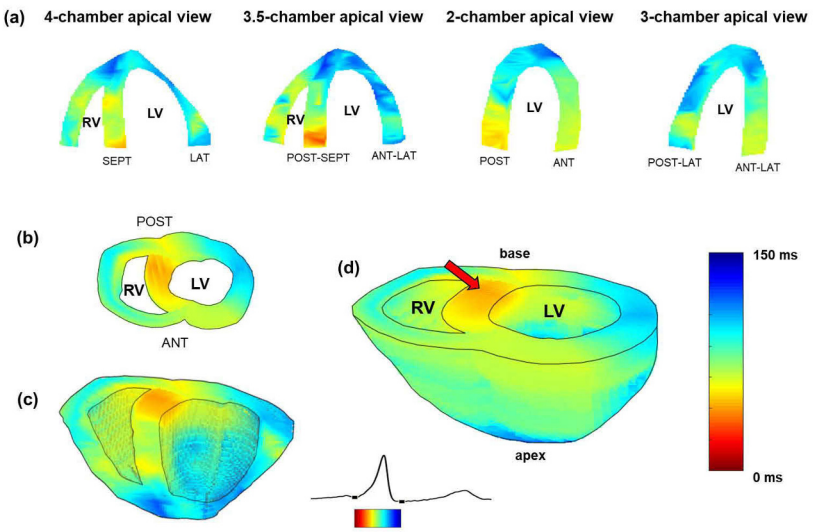

Figure 1: 3D rendered ultrasound imaging using EWI from a patient with WPW with a posteroseptal AP. Red shows earliest depolarization and location of AP. (**a**) 2D apical echocardiography views of the ventricles. (**b**) horizontal cross section shows septal location of earliest activation. (**c**) coronal cross section shows basal posteroseptal location of AP. (**d**) 3D view demonstrating location of the AP.