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Electromechanical Cycle Length Mapping For Atrial Arrhythmia Detection And Cardioversion Success Assessment

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Abstract:

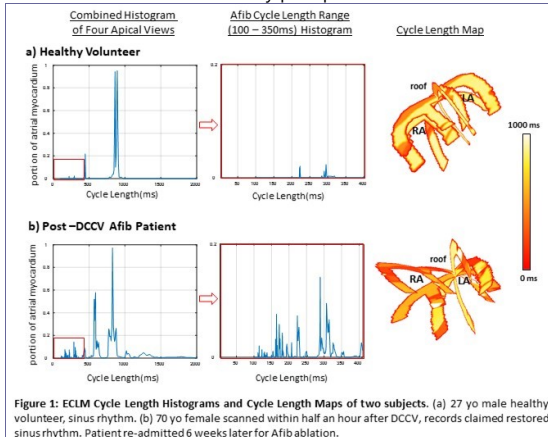
Background: Electromechanical Cycle Length mapping (ECLM) is a high frame rate (2000 fps) ultrasound-based frequency analysis technique, previously shown to non-invasively map atrial electromechanical activation in paced canines and re-entrant flutter (AF) patients.

Objective: The standard of care for arrhythmia diagnosis is a 12 lead ECG. More accurate localization before or during procedure may help decision making. This study tests ECLM feasibility of mapping atrial fibrillation (Afib) activation rate, monitor post-procedure recovery and potentially infer cardioversion (DCCV) failure in humans.

Methods: Eleven subjects (45.63±19.43 yo; 82% male; 2 AF; 3 Afib; 6 healthy volunteers) underwent transthoracic ECLM in four standard apical echocardiographic views. Afib patients were scanned pre and post DCCV. ECLM histograms were generated and the four 2D maps were co-registered spatially for each subject. Post DCCV results were then compared to healthy volunteers' ground truth.

Results: ECLM successfully identified the activation rate in all subjects. For the Afib cases, irregular activation rates were detected pre-DCCV and ECLM analysis suggested that 2 patients did not fully recover back to sinus rhythm post-DCCV, compared to healthy patterns (Fig.1). These results were later confirmed clinically as patients were re-admitted for re-do DCCV or follow-up ablation.

Conclusion: ECLM was shown capable of non-invasively mapping the electrical activation in AF, Afib and post DCCV, as well as potentially identifying unsuccessful DCCV immediately post procedure. ECLM could be used by clinicians as a helpful treatment assessment and monitoring tool for these patients.



Author Disclosure Information:

M. Tourni: Nothing relevant to disclose.

Category (Complete): Mapping & Imaging

Keywords (Complete): C -> Cardioversion ; E -> Echocardiography, transthoracic

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:** : understand how electromechanical cycle length mapping can assist for atrial arrhythmia detection and cardioversion success assessment immediately after cardioversion.

Abstract Awards (Complete):

None : True

Payment (Complete): Your credit card order has been processed on Monday 9 December 2019 at 10:05 AM.

Status: Complete

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