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Digital Automatic Chest Palpography Derived Mechanical Dyssnchrony Indices Increase with Right Ventricular Pacing

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QRS width and echocardiography derived indices are limited in the prediction of response to resynchronization therapy. We applied digital palpography using a new vibration resonance imaging technique to evaluate timing of mechanical events.

Aim: Evaluate and correlate parameters of mechanical dyssynchrony and left ventricular ejection fraction (LVEF).

Methods: Forty nine subjects were examined, 24 were normal controls, 18 subjects with right ventricular apical pacing 12 of them had reduced LVEF, and 7 subjects with reduced LVEF and narrow QRS. Digital measurement of QRS width was performed. Mechanical dyssynchrony was evaluated form digitally recorded chest palpogram using a matrix of 5x5 transducers. The interval between the onset of q-wave and the peak of the amplitude of vibration for each transducer was measured and a colored three dimensional map for the whole matrix of transducers was generated. Mean values (QE1) were measured. Mechanical vibration systolic dyssynchrony index (VSDI) for each subject was determined as the standard deviation of the difference between the median value and each transducer interval.

Results: Mechanical dyssynchrony indices were larger with pacing and reduced LVEF. QRS width correlated with QE1 (r2=0.75).

Conclusions: Digital chest palpogarphy derived dyssnchrony indices are larger with right ventricular pacing and reduced LVEF.