Hisatoshi Maeda, J Clin Exp Cardiolog 2014, 5:3
http://dx.doi.org/10.4172/2155-9880.S1.021

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Clinical & Experimental Cardiology
April 14-16, 2014 Hilton San Antonio Airport, TX, USA

Evaluation of regional work from ECG-gated SPECT images through solution of equations of continuity for fluids–mechanical cardiac work calculated using thin wall model

Hisatoshi Maeda
Nagoya University, Japan

Regional contraction work (RCW) of left ventricle (LV) was evaluated from cardiac perfusion images of ECG-gated single photon emission computed tomography (ECG-SPECT). The mechanical work was computed as a product of force and displaced distance. Force was determined from Laplace's law under a rectangle pressure. Deformation of wireframe representing LV was calculated from equations of continuity for two-dimensional fluids. Experiments were performed with homemade life-sized cardiac models. Total contraction work (TCW) and stroke work (SW) were 524.0 Å} 166.1 mJ/beat and 709.8 Å} 169.5 mJ/beat, respectively, in normal subjects (n = 23). Moderate correlation was seen between TC WandSW(y=−43.4+0.779 x, r=0.815). The regional contraction amplitude (RCA), synchronous contraction index and RCW were 35.4 Å} 3.5%, 95.4 Å} 3.1% and 5.58 Å} 0.97 mJ cm−2/beat in normal subjects, whereas those in patients with decreased ejection raction (EF) 30% (n = 6) were 19.6 Å} 7.7%, 64.4 Å} 32.2% and 2.58 Å} 0.82 mJ cm−2/beat (p < 0.0001, Student's t-test). There was a poor correlation between RCW and RCA (y = 1.648 Å} 0.116 x, r = 0.501) in normal subjects, suggesting that it might not be suitable to use RCA as an alternative to evaluate RCW.

Biography

Hisatoshi Maeda is a Professor of Emeritus at Nagoya University. He got MS in engineering from Tokyo University and MD from Kyoto University, and has finished Ph.D. at California Institute of Technology.

maeda@met.nagoya-u.ac.jp