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Quantification of synchronous contraction of left ventricle in normal subjects using ECG-gated-SPECT images

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Intact heart muscles are believed to contract synchronously to produce maximum effective work at a minimum energy cost. Temporal correlation coefficients between the left ventricular volume and muscle contraction were introduced to assess the synchronicity of left ventricular contraction (synchronous contraction index, SCI), and applied to eight normal volunteers.

Area-contraction and length-shortening parallel to and perpendicular to the long axis were computed from electrocardiogram (ECG)-gated single-photon emission computed tomographies (SPECT) using a homemade computer programme. The cardiac wall was divided into nine segments, and the average values of accumulation of perfusion agents, amplitude of contraction and SCI were obtained in each segment. The area-SCI was 91.4% Å} 4.3% and relatively uniform over the whole cardiac wall (p= 0.014, analysis of variance (ANOVA)), whereas the accumulation and amplitude of contraction varied significantly in different segments (p<0.0001, ANOVA). This study suggested that in normal subjects the myocardial contraction was synchronous, and that the amplitude of contraction was not spatially uniform.

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.

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