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Regional Assessment of Ventricular Hypokinesia by Magnetic Resonance Imaging (MRI)

Narjes Benameur and Tarek kraiem
Tunis El Manar University, Tunisia

Magnetic resonance imaging is the most used technique for the quantification of cardiac movement thanks to the tagged MRI sequence considered as the reference technique for the quantitative assessment of the heart's contraction. Nevertheless, this technique suffers from some limitations such as the fading of the tags before the cardiac cycle and its acquisition protocol which causes a loss of some of the quality characteristics of MRI image in particular its contrast. The objective of this work is to propose a method to calculate from the cine-MRI sequence, a parametric image showing the quantification of cardiac motion. The proposed method allows quantifying all the contraction amplitudes during a cardiac cycle into one image calculated from the analytical signals extracted from each pixel of the cine-MRI images. The originality of the proposed method is to calculate and quantify the instantaneous amplitudes of contraction through the mathematical tool "the Hilbert transform" which is well suited for cardiac signals characterized by their non-stationary aspect. We tested this method on a population consisting of healthy and pathological cases carriers of myocarditis and infarction. Comparing the results to those obtained with other methods, the proposed method shows a better performance for regional localization of cardiac contraction.

Biography

Narjes Benameur is pursuing her Doctoral degree in Biophysics at High Institute of Medical Technologies of Tunis-Tunisia. She is a member of Biophysics and Medical Technologies Laboratory at the same institute. She contributed to many conferences in the area of Medical Image Analysis and Cardiology with oral presentations. Her research interest includes "Cardiac imaging and new methods for the quantification of cardiac contraction".

narjes.benameur@yahoo.fr

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