

Three-dimensional analysis for the evaluation of left ventricular aneurysm and pseudo-aneurysm after myocardial infarction

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Myocardial Infarction (MI) is an ischemic heart disease representing one of the main causes of death for acute cardiac pathologies. Two important consequences of MI are left ventricular (LV) aneurysm and pseudo-aneurysm.

The aim of the present study is to highlight anatomical and functional changes in LV undergoing post-ischemic remodeling by means of three dimensional-Magnetic Resonance Imaging (MRI) and three dimensional-Computed Tomography (CT), which are useful techniques for the diagnosis and evaluation of accurate clinical and surgical approaches. In this way the surgeon can evaluate pro and counter of the classical approach or the parachute implant with possible promotion of minimvasive surgery [1]. Although to date MI consequences can be assessed with bidimensional technique (e.g. echocardiography and ventriculography), we want to suggest the use of three dimensional Direct Volume Rendering (DVR), which is a direct technique for visualizing primitive volumes without any intermediate conversion of the volume data to surface presentation [2].

DVR allows to better discriminate between aneurysm and pseudoaneurysm and to do a better evaluation of inclusion and exclusion criteria for the implant of a parachute device.

References

- [1] Bozdog-Turan I, Bermaoui B, Turan RG, Kische S, Paranskaya L, Kloker K, Ortak J, Akin I, Hauenstein K, Nienaber CA, Ince H. Parachute implant: CT morphological criteria of our center to identify the suitable patient. *Cardiovasc Ther.* 2014 Feb;32(1):26-31.
- [2] Anastasi G, Cutroneo G, Bruschetta D, Trimarchi F, Ielitto G, Cammaroto S, Duca A, Bramanti P, Favaloro A, Vaccarino G, Milardi D. Three-dimensional volume rendering of the ankle based on magnetic resonance images enables the generation of images comparable to real anatomy. *J Anat.* 2009 Nov;215(5):592-9.

Keywords

Aneurysm; direct volume rendering; myocardial infarction; pseudo-aneurysm.