Computers in Biology and Medicine

Volume 42, Issue 8, August 2012, Pages 863-870

Fluid-dynamics modelling of the human left ventricle with dynamic mesh for normal and myocardial infarction: Preliminary study

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https://doi.org/10.1016/j.compbiomed.2012.06.010

Abstract

Pulsating blood flow patterns in the left ventricular (LV) were computed for three normal subjects and three patients after myocardial infarction (MI). Cardiac magnetic resonance (MR) images were obtained, segmented and transformed into 25 frames of LV for a computational fluid dynamics (CFD) study. Multi-block structure meshes were generated for 25 frames and 75 intermediate grids. The complete LV cycle was modelled by using ANSYS-CFX 12. The flow patterns and pressure drops in the LV chamber of this study provided some useful information on intra-LV flow patterns with heart diseases.

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Keywords

Left ventricle; CFD; MRI; Dynamic mesh; Vortices; Pressure difference

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(2008); â€œDistributed Diagnosis and Home Healthcare, D2H2 v.1 & 3â€ (2009, 2012); â€œPerformance Evaluation in Breast Imaging, Tumor Detection & Analysisâ€ (2010); â€œComputational Analysis of Human eye with Applicationsâ€ (2011); â€œMultimodality Breast Cancer Imagingâ€ (2012); â€œHuman Eye Imaging and Modelingâ€ (2012); Co-authored a book: â€œCompressor Instability with Integral Methodsâ€ by Springer (2007). More details are available upon request and in URL: http://www.researcherid.com/rid/A-1375-2011.

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