BIVENTRICULAR PACEMAKER SYNCHRONIZATION: A NUMERICAL CARDIOCIRCULATORY MODEL APPLICATION TO REPRODUCE *IN VIVO* DATA

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Abstract

Cardiac Resynchronization Therapy (CRT) seems to be the most encouraging treatment to limit the damages of ventricular remodelling in patients with moderate-severe cardiac insufficiency. Mathematical modelling of the cardiovascular system is a tool potentially useful to understand how the Biventricular Pacemaker (BPM) must be synchronised during CRT. In this work a computer simulator reproduces clinical data measured, on different patients affected by asynchronous ventricular contraction, before and after CRT. Three patients, affected by asynchronous ventricular contraction, were monitored before and after biventricular stimulation through CRT. Measured and simulated data were compared. Results show that the software simulator can well reproduce in vivo data. Besides, simulated results from BPM together with drug therapy are in accordance with literature data. Numerical modelling could be a useful tool to optimize the BPM synchronization.

Keywords: circulatory system, hemodynamics, coronary circulation, left ventricle, computer simulation