Development of heart simulator (Heart-S) on the left ventricle for measuring the blood circulation during cardiac cycle

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ABSTRACT

Heart is a complex structure which acts as a blood pump in mammal's body. It is important to have detail study for the heart structure. Modeling of heart structure gives a better understanding and figure of the heart valve's movement as well as the fluid flow movement in the heart chamber. In this paper, the heart simulator (Heart-S) on the left ventricle for measuring the blood circulation during cardiac cycle was proposed. Throughout the experimental modeling of heart valve structure by using rhythmic fluid flow in a closed chamber, the relationship between heart valve elasticity and heart valve angle position to the valve opening width were investigated. The main aspect of the present development is to provide a heart simulator apparatus to obtain data for development of artificial heart and for observing the blood circulation measurement. The result shows good agreement on valve elasticity and the velocity of the fluid from the vortex in the heart chamber can be found after the experiment. The novelty of this development is contributing to the study of the optimal vortex formation in the heart chamber and observe the blood circulation measurement.

KEYWORDS

Blood circulation; Cardiac cycle; Heart apparatus; Heart simulator; Left ventricle

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