Simulation and Assessment the Heart Defect of the Patent Ductus Arteriosus Based on Hemodynamic Parameters

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Heart is one of the most important and vital body organs, which is responsible for pumping blood to different body tissues. Abnormalities in each part of heart can lead to lack of proper blood circulation. Arterial duct is one of major parts of embryonic cycles which may provide the possibility for a relationship between aorta and pulmonary artery. Closure of this duct causes the abnormality of patent ductus arteriosus(PDA). In this paper we propose a novel model for human heart for accurate simulation of Patent Ductus Arteriosus abnormality. The model is obtained by exploiting the mathematical relation between hemodynamic parameters of heart, including pressure, blood, volume, and flow. The proposed model is verified using clinical data.