



Modeling Internal Carotid Aneurysm Utilizing Lumped Method to Assess the Effect of Anatomical Variation on Efferent Arteries Pressures

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Lumped method (Electrical analogy) is one of the reliable ways to model human cardiovascular system. In this study, cardiovascular system is simulated using lumped method and complemented by extra compartments. New compartments start at largest arteries that supply the circle of Willis, and follows by circle of Willis arteries and finally ends with efferent arteries as a subset of cardiovascular system. A network of collateral vessel that called circle of Willis support adequate blood supply to the brain. Each vessel is modeled by resistor, capacitor and inductor. By using MATLAB software, the left and right ventricles are modeled by controlled voltage sources and diodes. In this study, internal carotid artery aneurysm with various incremental rates in fusiform shape is studied to assess the effects of aneurysm incremental rate as well as anatomical variation of circle of Willis (CoW) on efferent arteries pressure.