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Computational Study of Hemodynamic Effect of False Lumen Partial Thrombosis of Type B Aortic Dissection for various Tear Size and Configuration

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The aim of this investigation is to study numerically the hemodynamic effect of false lumen partial thrombosis of an aortic dissection for various tear size and configuration. The numerical model will be validated against the experimental results from a bench-top-model in the absence of thrombus. Various numerical meshes will be constructed using a finite-volume based Computational Fluid Dynamics (CFD) solver (ANSYS Fluent 15) to simulate pulsatile flow and pressure in dissected aorta models. The κ-ω Shear Stress Transport (SST) turbulence model will be imbedded. All simulations will be carried out for enough cardiac cycles to achieve a periodic solution, and the results obtained in the last cycle will be used in the validation. The effect of false lumen partial thrombosis for various tear size and configuration will be presented in this investigation. We anticipate that the presence of thrombus will affect significantly the pressure difference between the false lumen and true lumen as well as the flow pattern and wall stresses.

Biography

Khalil Khanafer has completed his PhD in Mechanical Engineering from Ohio State University. He has several years of experience in modeling thermal and biomedical applications. He is the head of Mechanical Engineering Department at Australian College of Kuwait. He has published more than 40 peer-reviewed journals and has been serving as an Associate Editors for Journal of Porous media and Special Topics & Reviews in Porous Media: An International Journal, and in the editorial board of Annals of Vascular Surgery.

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