

Numerical Study on the Hazards of Gravitational Forces on Cerebral Aneurysms

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Abstract : Aerobatic and military pilots are subjected to high gravitational forces that could cause blackout, physical injuries or death. A CFD simulation using fluid-solid interactions scheme has been conducted to investigate the gravitational effects and hazards inside cerebral aneurysms. Medical data have been used to derive the size and geometry of a simple aneurysm on a T-shaped bifurcation. The results show that gravitational force has no effect on maximum Wall Shear Stress (WSS); hence, it will not cause aneurysm initiation/formation. However, gravitational force cause causes hypertension which could contribute to aneurysm rupture.

Keywords : aneurysm, cfd, wall shear stress, gravity, fluid dynamics, bifurcation artery

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