

Abstract Submitted
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A hemodynamic-based dimensionless parameter for predicting rupture of intracranial aneurysms.¹ HAFEZ ASGHARZADEH, NICOLE VARIABLE, HUI MENG, IMAN BORAZJANI, The State University of New York at Buffalo — Rupture of an intracranial aneurysm (IA) is a disease with high rates of mortality. Given the risk associated with the aneurysm surgery, quantifying the likelihood of aneurysm rupture is essential. There are many risk factors that could be implicated in the rupture of an aneurysm. However, the hemodynamic factors are believed to be the most influential ones. Here, we carry out three-dimensional high resolution simulations on human subjects IAs to test a dimensionless number, denoted as An number, to classify the flow mode. An number is defined as the ratio of the time takes the parent artery flow transports through the expansion region to the time required for vortex formation. Furthermore, we investigate the correlation of IA flow mode and WSS/OSI on the human subject IAs. Finally, we test if An number can distinguish ruptured from unruptured IAs on a database containing 204 human subjects IAs.

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