

Abstract Submitted
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Rupture Risk Prediction of Abdominal Aortic Aneurysms (AAAs) RUBING TANG, UCSD, CHRISTIAN GEINDREAU, JUAN LASHERAS, UCSD — Currently there is no reliable method to predict the risk of rupture of AAAs. Our study seeks to improve the capabilities of biomedical techniques to better monitor the rupture risk of these aneurysms by quantifying the spatial and temporal distribution of mechanical stresses acting on the vessel walls. Specifically it aims at providing improved guidelines for surgical or endovascular intervention. Numerical simulations has been performed to calculate the wall stress distribution based on the peak blood pressure (static analysis) in both idealized and patient specific models of AAAs, using finite element method. Pulsatile blood flows were also simulated for idealized models with different parameters. Our results have shown that, in addition to the maximum AAA diameter, eccentricity and the presence of thrombus are also significant factors affecting the wall stress distribution, flow characteristics and hemodynamic forces in AAAs. Therefore, we confirmed that current criterion based solely on maximum diameter obtained from population-based statistics is not appropriate for the clinical management of AAA rupture, and other factors such as AAA shape and the presence of ILT should also be considered for a better assessment.

Rubing Tang
UCSD

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