A diameter matched comparison of wall stress and rupture potential index for abdominal aortic aneurysm

Increased blood pressure and arterial wall degradation lead to formation of abdominal aortic aneurysms (AAA). As elective AAA surgery is not without potential risk it is common practice to balance risk of rupture against risk of intervention. Usually a max. AAA diameter is the clinically accepted parameter where diameter > 55mm indicates intervention. However, it has been shown that computational wall stress analyses is a better indicator for rupture risk, e.g. by Fillinger et al 2003. In the presented study we use highly advanced FEA and statistical wall strength models to investigate whether current computational biomechanics analyses yields significant results when applied to groups of AAA with matched diameter in the decision-critical regime of approx. 55mm. For this purpose diameter matched groups of asymptomatic and ruptured/symptomatic AAA are examined and significance of computational rupture risk predictors is studied.