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Changes in wall shear stresses in abdominal aortic aneurysms with increasing wall stiffness ANNE-VIRGINIE SALSAC, University College London, MIGUEL FERNANDEZ, INRIA Rocquencourt — During the growth of abdominal aortic aneurysms, local changes occur in the composition and structure of the diseased wall, resulting in its stiffening. A numerical simulation of the fluid structure interactions is performed in idealized models of aneurysms using a finite element method. A full coupling of the equations governing the pulsatile blood flow and the deformation of the compliant wall is undertaken. The effect of the progressive stiffening of the wall is analyzed at various stages in the growth of the aneurysm. Increasing the wall stiffness alters the distribution of wall shear stresses and leads to an increase in their magnitude. The wall compliance is shown to have a more pronounced effect on non-axisymmetric aneurysms, which sustain large displacements. The overall movement of the aneurysm models increases the three-dimensionality of the flow.

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