

Abstract Submitted
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Towards the evaluation of the pathological state of ascending thoracic aneurysms: integration of in-vivo measurements and hemodynamic simulations ALESSANDRO BOCCADIFUOCO, Scuola Superiore Sant'Anna, ALESSANDRO MARIOTTI, DICI - University of Pisa, SIMONA CELI, NICOLA MARTINI, Fondazione Toscana Gabriele Monasterio, MARIA VITTORIA SALVETTI, DICI - University of Pisa — Ascending thoracic aortic aneurysms are cardiovascular diseases consisting in a dilation of the ascending thoracic aorta. Since indicating a weakness of the arterial wall, they can lead to major complications with significant mortality rate. Clinical decisions about surgery are currently based on the maximum aortic diameter, but this single index does not seem a reliable indicator of the pathological state of the aorta. Numerical simulations of the blood flow inside the aneurysm may give supplementary information by quantifying important indices that are difficult to be measured, like the wall shear stress. Our aim is to develop an efficient platform in which in-vivo measurements are used to perform the hemodynamic simulations on a patient-specific basis. In particular, we used real geometries of thoracic aorta and focused on the use of clinical information to impose accurate boundary conditions at the inlet/outlets of the computational model. Stochastic analysis was also performed, to evaluate how uncertainties in the boundary parameters affect the main hemodynamic indicators, by considering both rigid and deformable walls. Stochastic calibration of numerical parameters against clinical data is in progress and results will be possibly shown.

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