

Perfusion optimisation for vascular grafts design used in the treatment of aortic disease

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Regions of the aortic arch affected by an aneurysm or dissection may require surgical intervention using vascular grafts, which includes a means of re-perfusing the supra-aortic branch vessels. However, graft configuration to ensure optimal post-surgical perfusion is currently poorly understood. Therefore, enhanced understanding of perfusion in patient-specific cases is critical to improving clinical practice and patient outcomes. In this work, a combination of computational and experimental models of the aortic arch were created to investigate the pre-surgical haemodynamics of the aortic arch, using a coupled 3D-0D numerical framework to simulate a range of downstream conditions, both healthy and pathological.

Keywords: aortic arch, patient outcomes, haemodynamics

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