

Simulation of blood flow in abdominal aortic aneurysms treated with suprarenal and fenestrated stent grafts

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Abstract

Purpose: The purpose of this study was to simulate the blood flow features in patients with abdominal aortic aneurysms treated with suprarenal and fenestrated stent grafts, which are two commonly used endovascular techniques to deal with complicated aneurysm necks.

Content organization

- A. Segmentation of CT volume data for acquisition of aorta model
- B. Generation of CAD aorta model
- C. Creation of aorta mesh for flow analysis
- D. Addition of physiological parameters to the aorta model
- E. Application of pulsatile pressure to inlet and outlets
- F. Performance of computational fluid analysis
- G. Measurements of flow rate, wall pressure and shear stress in pre-and post-stent grafting

Conclusion (and teaching points):

Simulation of blood flow features in abdominal aortic aneurysms treated with suprarenal and fenestrated stent grafts was successfully performed in this study. This exhibits reviews:

- A. The methodology to generate aorta model and meshes for performing simulation of blood flow in aortic aneurysm and its branches
- B. To understand the flow changes in situations pre-and post-stent grafting, so as to assist endovascular specialists understand the treatment outcomes of endovascular repair
- C. To analyse the shear stress of aortic aneurysm with aim of identifying the potential risk of rupture