Accepted Manuscript

Modelling and simulation of flow and agglomeration in deep veins valves using discrete multi physics

M. Ariane, W. Wen, D. Vigolo, A. Brill, F.G.B. Nash, M. Barigou, A. Alexiadis

PII: S0010-4825(17)30244-5

DOI: 10.1016/j.compbiomed.2017.07.020

Reference: CBM 2731

To appear in: *Computers in Biology and Medicine*

Received Date: 8 May 2017

Revised Date: 10 July 2017

Accepted Date: 28 July 2017

Please cite this article as: M. Ariane, W. Wen, D. Vigolo, A. Brill, F.G.B. Nash, M. Barigou, A. Alexiadis, Modelling and simulation of flow and agglomeration in deep veins valves using discrete multi physics, *Computers in Biology and Medicine* (2017), doi: 10.1016/j.compbiomed.2017.07.020.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Modelling and simulation of flow and agglomeration in deep veins valves using Discrete Multi Physics.

M. Ariane[a,*], W. Wen[a], D. Vigolo[a], A. Brill[b], F. G.B Nash[b], M. Barigou[a], A. Alexiadis[a,*]

[a] School of Chemical Engineering, University of Birmingham, Birmingham, United Kingdom

[b] Institute of Cardiovascular Sciences, University of Birmingham, Birmingham, United Kingdom

Abstract

The hemodynamics in flexible deep veins valves is modelled by means of discrete multi-physics and an agglomeration algorithm is implemented to account for blood accrual in the flow. Computer simulations of a number of valves typologies are carried out. The results show that the rigidity and the length of the valve leaflets play a crucial role on both mechanical stress and stagnation in the flow. Rigid and short membranes may be inefficient in preventing blood reflux, but reduce the volume of stagnant blood potentially lowering the chances of thrombosis. Additionally, we also show that in venous valves, cell agglomeration is driven by stagnation rather than mechanical stress.

Keywords: Discrete Multi-Physics, Smoothed Particle Hydrodynamics, biological venous valve, Clot, Deep Venous Thrombosis.

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات