Numerical Investigation of Blood Flow around a Leaflet Valve through a Perforating Vein

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Abstract : Diseases related to leg venous system are common worldwide. An incompetent vein with deformed wall and insufficient valves affects flow field of blood and disrupts the process of blood circulating system. Having enough knowledge about the flow field through veins will help find new ways to cure the related diseases. In the present study, blood flow around a leaflet valve of a perforating vein is investigated numerically by Finite Element Method. Flow behavior and vortexes, generated around the leaflet valves, are studied considering valve opening percentage. Obtained velocity and pressure fields show mechanical stresses on vein wall and these valves and consequently introduce the regions susceptible to deformation.

Keywords : fluid flow, leaflet valve, numerical investigation, perforating vein
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