

FLOW CHARACTERISTICS IN A VASCULAR TUBE WITH AN OVERLAPPING CONSTRICTION

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A numerical solution to the unsteady blood flow in the neighbourhood of an overlapping constriction is obtained under laminar flow conditions. Blood is modelled as a viscous, incompressible and of Newtonian type fluid. A finite-difference staggered grid has been used to solve the unsteady incompressible Navier-Stokes equations in cylindrical polar co-ordinates under the axi-symmetric conditions. A co-ordinate transformation has been employed to map the constricted tube into a straight tube. The effect of flow characteristics in this type of constriction and its consequences in arterial diseases are investigated. Flow features such as velocity, pressure and wall shear stress distributions are presented graphically. The secondary separation has been noted in the downstream of the overlapping constriction when the Reynolds number of the flow is about 205.

Key words: overlapping constriction, staggered grid, finite-difference scheme, axi-symmetric flow.

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