

## عنوان مقاله:

Study of Pulsatile Flow in Common Carotid Artery with Different Stenosis' Shapes within Various Wall Conditions

## محل انتشار:

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## خلاصه مقاله:

Recently, due to the development of CFD techniques, many attempts have been made to simulate the initiation and progression of atherosclerosis. In recent works, various curves have been suggested to model the stenosis shape. However, little effort has been made to study the importance of the stenosis shape on the flow behavior. In this study, four types of stenosis with asteroid, Gaussian, semi-circle, and sinusoidal shapes were simulated in order to study the effect of the stenosis shape on flow behavior and diagnosis parameters. Shear stress and flow behavior were investigated in the common carotid artery with stenosis severities of ۳۰%, ۴۰%, and ۵۰%. Flow was assumed to be unsteady and the inlet to be a pulsatile flow. Two cases of Newtonian and non-Newtonian fluids were simulated. The no-slip and permeable boundary conditions were imposed on the outer walls. To examine the effect of the location of stenosis, modeling was conducted at various locations. The results showed that the maximum shear stress occurs in the Gaussian stenosis at the opening of the stenosis. Semi-circle, sinus, and asteroid shapes had the next largest shear stress values. Additionally, the location of stenosis had a negligible effect on the maximum shear stress. However, flow resistance increased with increasing the stenosis's distance from the beginning of the artery. This study indicates that stenosis shape highly affects the flow characteristics, and stenosis severity is not the only parameter .that is important. Hence, the stenosis shape should be considered when simulating atherosclerosis

## کلمات کلیدی:

Pulsatile flow, Common carotid artery, Permeable walls, Stenosis, Newtonian fluid

## لینک ثابت مقاله در پایگاه سیویلیکا:

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