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Renal hemodynamics: the influence of the renal artery ostium flow diverter JENN STROUD ROSSMANN, SCOTT ALBERT, Lafayette College, ROBERT BALABAN, National Institutes of Health — The recently identified renal artery ostium flow diverter may preferentially direct blood flow to the renal arteries, and may also influence flow patterns and recirculation known to be involved in atherogenesis. Three-dimensional computational fluid dynamics (CFD) simulations of steady and pulsatile blood flow are performed to investigate the influence of diverter size and position, and vascular geometry, on the flow patterns and fluid mechanical forces in the neighborhood of the diverter. CFD results show that the flow diverter does affect the blood distribution: depending on the diverter's position, the flow to the renal arteries may be increased or reduced. The results of simulations also show the diverter's effect on the Wall Shear Stress (WSS) distribution, and suggest that the diverter contributes to an atherogenic environment in the abdominal aorta, while being atheroprotective in the renal arteries themselves. These results support previous clinical findings, and suggest directions for further clinical study. The results of this work have direct implications in understanding the physiological significance of the diverter, and its potential role in the pathophysiological development of atherosclerosis.

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