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Influence of surgical implantation angle of left ventricular assist device outflow graft and management of aortic valve opening on the risk of stroke in heart failure patients V. KESHAV CHIVUKULA, PATRICK MCGAH, U. Washington, ANTHONY PRISCO, U. Minnesota, JENNIFER BECKMAN, Div. Cardiology, NANUSH MOKADAM, Div. Cardiothoracic Surgery, CLAUDIUS MAHR, Div. Cardiology, ALBERTO ALISEDA, U. Washington — Flow in the aortic vasculature may impact stroke risk in patients with left ventricular assist devices (LVAD) due to severely altered hemodynamics. Patient-specific 3D models of the aortic arch and great vessels were created with an LVAD outflow graft at 45, 60 and 90^o from centerline of the ascending aorta, in order to understand the effect of surgical placement on hemodynamics and thrombotic risk. Intermittent aortic valve opening (once every five cardiac cycles) was simulated and the impact of this residual native output investigated for the potential to wash out stagnant flow in the aortic root region. Unsteady CFD simulations with patient-specific boundary conditions were performed. Particle tracking for 10 cardiac cycles was used to determine platelet residence times and shear stress histories. Thrombosis risk was assessed by a combination of Eulerian and Lagrangian metrics and a newly developed thrombogenic potential metric. Results show a strong influence of LVAD outflow graft angle on hemodynamics in the ascending aorta and consequently on stroke risk, with a highly positive impact of aortic valve opening, even at low frequencies. Optimization of LVAD implantation and management strategies based on patient-specific simulations to minimize stroke risk will be presented

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