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**Effects of stenotic mitral valve on left ventricle hemodynamics**

ROBERTO VERZICCO, VALENTINA MESCHINI, Univ of Roma "Tor Vergata", FRANCESCO VIOLA, GSSI Gran Sasso Science Institute (L'Aquila) IT — The mitral valve is a bi-leaflet passive structure that, driven by pressure differences between the left atrium and ventricle of the heart, opens and closes during the heartbeat to ensure the emptying and filling of the chambers and the correct flow direction. In elderly individuals or because of particular pathologies, the valve leaflets can stiffen thus impairing the valve functioning and, in turn, the pumping efficiency of the (left) heart. Using the multi-physics left heart model of Viola et al. (2020) [Eur. J. Mech. B/fluids, 79,212], accounting for the electrophysiology, the active contraction of the myocardium and the hemodynamics, we have investigated the changes in the flow structures and in the cardiac output for different severities of the mitral valve stenosis. We have found that, in addition to the expected increase of the transvalvular pressure drop, and decrease of the pumping efficiency, a stenotic mitral valve alters the large scale recirculation of the left ventricle that is beneficial to prevent hemostasis and clot formation.

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