

Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Hemodynamics of the left heart with physiologic and pathologic mitral valve: the chordae tendinae effect ROBERTO VERZICCO, Uniroma2, UTwente, GSSI, VALENTINA MESCHINI, Uniroma2, FRANCESCO VIOLA, UTwente — One of the advantages of computational engineering is the possibility to vary one factor of a system, while leaving all the others unchanged, and to assess its effect. In cardiovascular flows this strategy allows to selectively investigate modifications of the intraventricular hemodynamics produced by myocardial tissue remodeling or pathologies. In this study, we rely on our in-house multi-physics numerical model that dynamically couples electrophysiology, tissue mechanics and hemodynamics in physiological and pathological conditions to carry out direct numerical simulations of the left heart dynamics. Here, we present the effect of loose or broken chordae tendinae of the mitral valve on the ventricular pumping efficiency in terms of cardiac output, valve regurgitation and large scale flow structures. The results are seen to agree with the available clinical data, thus suggesting that this computational tool could be used to predict the effects of a valve sparing procedure and to improve the outcome of a surgical interventions.

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Date submitted: 26 Jul 2019

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