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Assessment of transmitral flow after mitral valve edge-to-edge repair using High-speed particle image velocimetry MORTEZA JEYHANI, Mech. Eng. Dept., Concordia Univ., Montreal, Canada, SHAHROKH SHAHRIARI, University of Montreal Hospital Research Center (CRCHUM), Montreal, Canada, MICHEL LABROSSE, Mech. Eng. Dept., University of Ottawa, Ottawa, Canada, LYES KADEM, Mech. Eng. Dept., Concordia Univ., Montreal, Canada — Approximately 500,000 people in North America suffer from mitral valve regurgitation (MR). MR is a disorder of the heart in which the mitral valve (MV) leaflets do not close securely during systole. Edge-to-edge repair (EtER) technique can be used to surgically treat MR. This technique produces a double-orifice configuration for the MV. Under these un-physiological conditions, flow downstream of the MV forms a double jet structure that may disturb the intraventricular hemodynamics. Abnormal flow patterns following EtER are mainly characterized by high-shear stress and stagnation zones in the left ventricle (LV), which increase the potential of blood component damage. In this study, a custom-made prosthetic bicuspid MV was used to analyze the LV flow patterns after EtER by means of digital particle image velocimetry (PIV). Although the repair of a MV using EtER technique is an effective approach, this study confirms that EtER leads to changes in the LV flow field, including the generation of a double mitral jet flow and high shear stress regions.

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