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Effect of mitral valve prosthesis design and orientation on intraventricular flow and blood stasis KAREN MAY-NEWMAN, J CAMPOS, R MONTES, V RAMESH, J MOON, C REIDER, San Diego State University, P MARTINEZ-LEGAZPI, J BERMEJO, Hospital Gregorio Maran, LORENZO ROSSINI, JUAN C DEL ALAMO, UC San Diego — Abnormal blood flow patterns are linked with thromboembolism (TE), especially in the presence of medical devices such as mitral valve prostheses (MVP). We performed PIV on a customized silicone left ventricle (LV) in a mock circulatory loop. We measured the velocity field in the long-axis midplane for 3 different MVP: a porcine bioprosthesis (BP), a tilting disk valve in two orientations: towards the LV lateral (TD-L) or the anterior wall (TD-A), and a bileaflet valve with anti-anatomical orientation (BL). Diastolic LV vortices were tracked and related to measures of blood stasis based on LV residence time. The BP and the TD-L produced flow patterns similar to those measured in patients. The TD-A showed a complete reversal of diastolic vortices. The BL design had increased apical blood stasis, which may lead to increased TE risk.

Juan Carlos del Alamo
University of California at San Diego

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