

Innovative Mitral Valve Replacement Procedure Shows Promise for High-Risk Patients in Miller School Study

An innovative mitral valve replacement procedure shows promise for high-risk patients in a new University of Miami Miller School of Medicine study led by Joseph Lamelas, M.D., chief and program director of cardiothoracic surgery.

“Limited surgical treatments are available for high-risk patients with severe mitral annular calcification, a hardening of the ring at the base of the valve,” said Dr. Lamelas. “Our team has achieved good outcomes with a minimally invasive transcatheter aortic valve prosthesis in the mitral valve position (MVR-TAVR).”



Dr. Joseph Lamelas

Dr. Lamelas was the lead author of the study, “Early Outcomes for Surgical Minimally Invasive SAPIEN 3 Transcatheter Mitral Valve Replacement,” [published in *Annals of Thoracic Surgery*](#), the journal of American Thoracic Society. His co-author was Ahmed Alnajjar, M.D., an analyst in Dr. Lamelas’ laboratory. The study findings were presented at the 2020 meeting of the Society for Thoracic Surgeons.

Mitral annular calcification is a chronic, degenerative calcification of the fibrous tissue surrounding the mitral valve, which sits on a circular or oval annular ring in the heart. “This is a very threatening disease that occurs in up to 15 percent of high-risk patients, which contributes to high rates of adverse outcomes and mortality,” said Dr. Lamelas.

To treat this condition, Dr. Lamelas takes an expandable SAPIEN 3 aortic valve made by Edwards Lifesciences, flips it around and delivers it into the patient's mitral valve. "It must be carefully positioned to avoid blood leaks through small gaps around the annular ring," he said. "Also, if the new valve is placed too deeply, it can obstruct the blood flow leaving the heart, so careful imaging is required throughout the procedure."

The Miller School study focused on 16 patients from age 53 to 88 who underwent MVR-TAVR procedures between 2017 and 2019. All had serious comorbidities, including previous heart surgery, right ventricular dysfunction, severe pulmonary hypertension, and chronic kidney disease. The 30-day mortality rate was estimated at 12.5 percent – well below the 30 percent recorded in a recent registry for transcatheter MVR and 20 percent for the surgical transatrial approach reported in the same study.

"Our experience is associated with a high rate of technical success, a low complication rate, and an acceptable 30-day mortality rate in patients with significant and extensive mitral annular calcification," he said. "It is a feasible alternative to conventional mitral valve replacement, although it requires a significant learning curve given the variable anatomy and comorbidities of individual patients."

Looking ahead, Dr. Lamelas said treating these high-risk patients will require enhanced surgical techniques, additional valve design, careful patient selection, thorough imaging, and extensive surgical experience. He added, "Our goal is to obtain safe and satisfactory outcomes for patients with these

severe heart problems.”
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