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Treatment of mitral bio-prosthetic valve deterioration using trans-apical valve in valve technique: Intermediate-term outcomes

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Objective: The transcatheter approach for a failed bio-prosthetic valve is an emerging alternative to redo-valve surgery in patients at high surgical risk. We aim to analyze the mid-term outcomes of patients undergoing valve-in-valve implantation in the mitral position.

Methods: A dual center clinical experience in treating consecutive patients with symptomatic structural bio-prosthetic mitral valve deterioration using the valve-in-valve technique via the transapical approach. Outcomes were rigorously assessed and reported based on VARC 2 criteria definitions.

Results: The valve-in-valve procedure in the mitral position was performed in 30 patients, mean age 76±12 years, mean STS score 10.7±6.0. Balloon-expandable sapien devices were used in all patients. The composite endpoint of device success was achieved in 29/29 (100%) of patients. The operative mortality was 3.5% (sepsis). Follow up (up to 6 years, mean 29 months) demonstrated survival rates of 90% and 83.3% during first and second year, respectively and remain constant afterward. Only one patient had cardiovascular related mortality (endocarditis) during this period. Most of surviving patients (96%) are in NYHA-FC I/II. No valve migration was observed. The mitral regurgitation degree among patients with predominant mitral regurgitation dropped immediately after the operation and remains constant during follow-up period (from 3.9±0.3 to 0.2±0.6 and 0.3±0.5, respectively. Post procedural mean mitral transvalvular gradient was 6.4±3.0 mmHg and remain constant during follow-up (6.3±1.6 mmHg, ns). Only one patient had mild para-valvular (PVL) leak. All other patients had no PVL. The pre-operative pulmonary artery pressure decreased from 67.2±18.4 to 43.8±11.2 at follow-up ($p>0.01$).

Conclusions: Intermediate-term clinical outcomes of transcatheter valve-in-valve implantation for the treatment of mitral prosthetic valve deterioration in high risk patient are encouraging. Despite significant clinical improvement, residual elevated gradients across the valve, unrelated to the original deteriorated valve size were observed. This novel approach allows good survival rate and satisfactory quality of life during mid-term follow-up period.

Biography

Ram Sharony is the Director of Minimally Invasive Cardiac Surgery at Rabin Medical Center, Israel. He is a Graduate of Ben Gurion University. He completed his Residency in Cardiothoracic Surgery. As an attending surgeon, he was recruited by Tel Aviv Medical Center and shortly thereafter he was sent to a fellowship at New York University (NYU), USA. In his first year, he performed a basic research and focused on expression of Serine protease inhibitors and MAP kinases pathway in vein grafts remodeling and published his basic science research in leading scientific journals. In the second year of fellowship, he focused on clinical activity of minimally invasive valve surgery. He published his clinical research on the topic of mitral valve repair, outcomes of AVR among patients with reduced LV function, and his manuscripts on the survival benefit of off pump CABG in patients with atheromatous aorta contribute to the popularity of this operation in this subset population. In addition, his papers regarding the advantages of minimally invasive AVR over median sternotomy has been cited by many authors and contributed to the development of less invasive approach. Since 2008, he serves as Director of minimally invasive unit at Rabin Medical Center, Israel, where he performs various types of mitral valve operations (replacement or repair) and aortic valve surgeries via less invasive approach for patients from different places in Israel and international medical tourism. As part of his clinical activity he leads the collaboration with the invasive cardiologists (TAVI team) and performs surgical procedures with catheter valve technologies. In addition to trans apical approach for TAVI, various type of mitral valve in valve operation have been performed at Rabin medical center including direct Sapien valve deployment in severe mitral annular calcification (MAC). He is the director of medical student's program and the residency program. In addition to his contribution as chapter author in textbooks (including the chapter of acquired heart diseases in Schwartz's Principles of Surgery), Dr. Sharony has published on the topic of the myocardial protection (ischemic and pharmacologic preconditioning) and was involved in the research and development of heart assist device for the failing heart. His recent scientific activity is on the topics of valvular heart disease, mainly tricuspid valve and transcatheter valve procedures. Ram is a proctor of Perceval sutureless valve (Livanova, Italy) and have gained a large experience with rapid deployed valve in many international medical centers. He has been invited as a speaker and panel discussant in various scientific meetings.