Percutaneous implantation of a 26 mm Edwards SAPIEN-XT aortic valve prosthesis in a degenerated 30 mm mitral annuloplasty ring

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A 80-year-old male presented with New York Heart Association (NYHA) IV functional class and peripheral oedema 6 years after mitral valve (MV) surgery comprising restrictive annuloplasty (St Jude Medical Seguin ring, 30 mm), implantation of neo-chordae and pericardial patch plastic of the posterior MV leaflet. Echocardiography showed severe MV stenosis [Panel A, two-dimensional (2D) Doppler trace of the MV; Panel B, 3D transoesophageal echocardiography (TEE) of the annuloplasty ring and MV orifice]. Open-heart surgery was declined because of relevant co-morbidities (logistic EuroSCORE 37.4%; STS-Score: 9.3%). Therefore, a percutaneous transvenous MV implantation with a ‘valve-in-ring’ technique was planned. To assess feasibility, ex vivo implantation of a transfemoral balloon expandable aortic valve (TAVI) bioprosthesis (Sapien XT, Edwards Life-sciences, Irvine, CA, USA) in a SJM Seguin 30 mm ring was performed, which confirmed stable positioning of a 26 mm prosthesis inside the rounded MV ring with some extend of a periprosthetic leakage (Panel C, * indicates periprosthetic leakage). Therefore, we planned the valve expansion with adding 2 mL of extra fluid to the recommended balloon-volume for this TAVI prosthesis. Thereafter, a transfemoral delivery system for TAVI was used to deliver the stented valve in the mitral position over a transvenous, transseptal antegrade approach (Panel D, fluoroscopy of the aortic valve insertion). The bioprosthesis was deployed successfully within the non-fluoroscopic MV ring under TEE guidance. Three-dimensional echocardiography confirmed proper positioning and function of the bioprosthesis with acute reduction of the measurable transvalvular pressure gradient, and without periprosthetic leakage (Panel E, 3D TEE en face view of the acute procedural result; Panel F, 2D TEE with Doppler trace of the MV). The patient was discharged on Day 7 after the procedure with improved functional NYHA class II.

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