CoreValve Degeneration With Severe Transvalvular Aortic Regurgitation Treated With Valve-in-Valve Implantation

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A 77-year old woman presented with sudden onset of dyspnea New York Heart Association functional class IV, bilateral pleural effusion, and acute renal failure (serum creatinine 2.1 mg/dl) occurring 3 years after transcatheter aortic valve replacement (TAVR) with use of a self-expanding...
CoreValve 29-mm prosthesis (Medtronic, Minneapolis, Minnesota).

Five months ago, routine follow-up after TAVR had been uneventful with only trace paravalvular aortic regurgitation (AR). Echocardiography revealed the new onset of severe degenerative transvalvular AR with holodiastolic flow reversal in the aorta due to prolapse of 1 bioprosthetic valve cusp, however, without signs of underlying prosthetic valve endocarditis (Figs. 1A and 1B, Online Videos 1, 2, and 3). The patient’s medical history was free of fever or other signs of systemic inflammation (white blood cell count 7.88 g/l; C-reactive protein 15.1 mg/l; procalcitonin 0.08 μg/l). Serial blood cultures were without evidence for bacteremia.

Due to a Society of Thoracic Surgeons score of 9.6% and previous TAVR in 2010, the Heart Team decided to perform transcatheter heart valve (THV)-in-THV implantation. The new prosthesis was successfully implanted at the same height as the previous valve without pre-dilation. Transesophageal echocardiography confirmed competent aortic valve leaflet coaptation without trans- or paravalvular AR (Figs. 1D and 1E, Online Videos 4, 5, and 6). The hemodynamic AR index increased significantly from 18.8 to 34.6 (Figs. 1C and 1F) (1). After the procedure, the patient improved immediately to New York Heart Association functional class II (N-terminal pro-B-type natriuretic peptide decreased from 5,435 pg/ml to 970 pg/ml) and renal function restored to baseline values (serum creatinine 1.4 mg/dl).

Here, we report the first case of a late-onset degenerative transvalvular AR in a patient with the self-expanding Medtronic CoreValve bioprosthesis, which was treated successfully by THV-in-THV implantation as an easily feasible treatment strategy for long-term THV failure. Furthermore, the order of events demonstrates the detrimental effect of severe AR on renal function culminating in cardio-renal syndrome, which appears to be potentially reversible after restoration of valve and heart function (1,2).

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REFERENCES

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APPENDIX

For supplemental videos, please see the online version of this article.