Interventional closure of paravalvular leakage after transcatheter aortic valve implantation

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An 83-year-old female patient presented with pulmonary oedema 2 months after transcatheter aortic valve implantation (TAVI) with a balloon-expandable transcatheter heart valve (THV) (Edwards SAPIEN XT 23 mm). The THV had been properly sized [maximum annulus diameter 21 mm in three-dimensional transoesophageal echocardiography (3D-TEE) and 24 × 20 mm in computed tomography], but the severely calcified non-coronary cusp prevented tight sealing of the native aortic annulus resulting in Grade 3 aortic regurgitation (AR) (Panels A and B). As moderate-to-severe peri-prosthetic AR after TAVI is associated with increased mortality, measures were taken to reduce the AR. At first, the THV was dilated with a 22 mm valvuloplasty balloon, unfortunately without any significant improvement (AR index = 21.7). Implantation of another, for example, self-expandable valve was considered but then rejected, since placement and implantation height of the prosthesis in place appeared appropriate. Therefore, the interventional closure of the paravalvular leakage with the Amplatzer Vascular Plug III (AGA Medical Corporation, Plymouth, MA, USA) remained as a viable option. Passage into the left ventricle was obtained using a JR4 catheter and a straight Terumo wire, avoiding crossing through the prosthesis stent struts. Prior to introduction of the 9 F delivery sheath in the paravalvular space (Panel C), the THV was secured with insertion of a transvalvular Amplatz Super Stiff wire via a pigtail catheter placed in the left ventricle in order to be able to control the valve prosthesis during possible peri-interventional dislodgement (Panel D). Secure placement and deployment of the plug was performed with 3D-TEE and angiographic guidance. Post-procedure, the AR index increased to 30.8 and only trivial AR was seen in 3D/biplanar TEE and aortography, respectively (Panels E and F). The functional status of the patient improved immediately after the procedure and she was discharged on Day 5 after the procedure.

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