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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

Transcatheter implantation of self-expanding valve for failed stentless aortic root bioprosthesis

Przezcewnikowa implantacja samorozprężalnej zastawki po niepowodzeniu wszczepienia bezstentowej bioprotezy opuszki aorty

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Although repeat aortic valve replacement (AVR) remains the standard treatment for failed bioprostheses, the feasibility of transcatheter aortic valve implantation (TAVI) has also been demonstrated. We report the successful implantation of a CoreValve™ self expanding aortic prosthesis (Medtronic, Inc) in a patient with a degenerated BioConduit™ stentless valve conduit (Shelhigh, Inc).

A 63 year-old man was admitted due to NYHA class IV heart failure symptoms. He had a history of triple percutaneous coronary intervention followed by AVR plus LIMA to LAD grafting. Two years after the first surgery, acute dissection of the ascending aorta occurred and the mechanical valve along with the proximal ascending aorta were replaced by a stentless 25 mm valve conduit. Postoperative mediastinitis and atrio-ventricular block warranted sternum refixation and pacemaker implantation. Another year later, the patient underwent conservative treatment for prosthetic valve endocarditis.

On current admission, transthoracic and transoesophageal echocardiography (TTE, TEE) revealed left ventricle (LV) end-diastolic diameter (EDD) of 62 mm and ejection fraction (EF) of 25%. Bioprosthetic cusps were opening well but seemed perforated and had attached two additional structures of ultrasound intensity, irregular shape and high mobility corresponding to organised bacterial vegetations. Consequently, severe aortic regurgitation (AR) was present. On coronary angiography, the arterial graft was occluded and no revascularisation within native coronaries was required. The unfavourable anatomical environment expected after mediastinitis accompanied by high STS scoring (16%) and wide peripheral arteries contributed to a decision to reject reoperation in favour of the transcatheter approach. On multi-detector computed tomography (MDCT), the prosthesis length was 45 mm with significant angulation of neighbouring ascending aorta and coronaries reimplanted 12 mm and 17 mm above the valve (Fig. 1). Laboratory findings excluded active infective endocarditis. After induction of general anaesthesia, a Prostar XL (Abbott) device was introduced into the right common femoral artery. Next, a 26 mm CoreValve prosthesis (the size had been selected according to the inner BioConduit diameter of 22 mm by TEE, standard delivery system) was positioned and deployed in a retrograde manner. Lack of fluoroscopy markers such as calcifications or rigid ring rendered the procedure more TEE-dependent. After completion, no transprosthetic gradient was measured and residual paravalvular AR was trivial. Nevertheless, deficient expansion of the stent frame distal part within the non-pliable BioConduit was noted. The time from arterial puncture to closure was 65 min with 22 min of fluoroscopy, and 180 mL of contrast agent was used. The post-procedural course was uneventful and the patient remained asymptomatic at 12-month follow-up. A remarkable improvement in LV performance was noted, with EDD of 54 mm and EF of 56% by TTE. Repeated MDCT visualised uncompromised coronaries ostia and persistent distal stent frame deformation. Proximal circularity remained however unaffected, which corresponded to the valve's excellent function (Figs. 2, 3).

Initial balloon valvuloplasty may optimise transcatheter valve stent alignment at the expense of degenerated bioprosthesis fragmentation and peripheral embolisation. The anticipated fragility of the thin-walled bioprosthetic cuff further added to our refraining from the manoeuvre. Lack of natural aorta sinus widening in patients with full root prostheses renders coronary flow impairment during TAVI more likely. This was avoided by careful positioning of the CoreValve sealing skirt below the coronaries' ostia.

Figure 1. Initial MDCT, volume rendering: assessment of coronaries' reimplantation level and aorta angulation above the BioConduit

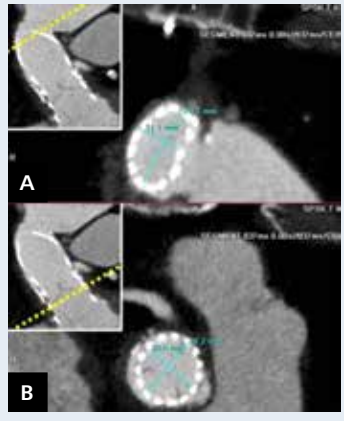

Figure 2. Follow-up MDCT, maximal intensity projection (MIP): CoreValve stent frame cross-section shape at distal (**A**) and cusps level (**B**)

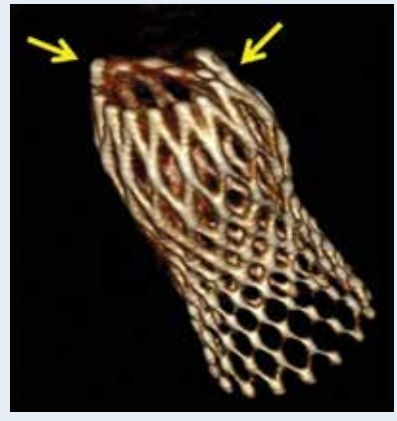

Figure 3. Follow-up MDCT, volume rendering: distortion (arrows) of the distal part of CoreValve stent frame

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