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Infectious endocarditis after valve-in-valve transcatheter aortic valve implantation.

Reoperative treatment of infectious endocarditis

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The rate of intervention due to a biological aortic valve prosthesis dysfunction is approximately 15% per 10 years [1]. Performed since 2007, valve-in-valve transcatheter aortic valve implantation (ViV TAVI) is a less invasive alternative for surgical reoperation (SAVR). A 73-year-old male patient was admitted with infectious endocarditis (IE) three months after ViV TAVI with Medtronic Evolut R 26. ViV TAVI was performed in October 2018 because of rapid degeneration of Hancock II 23 surgical aortic valve bioprosthesis (an increase in maximum and mean gradients from 42 to 108 mmHg and 27 to 58 mmHg), implanted 3 years earlier with concomitant CABG (LIMA to LAD, SVG to RCA). History of LIMA grafting, comorbidities (atrial fibrillation, chronic renal insufficiency, chronic pulmonary obturation, anemia, history of gastrointestinal tract bleeding), and high mortality risk (8.66%) according to the EuroSCORE II were indications for ViV TAVI rather than repeat SAVR. TAVI procedure was uneventful, and showed improvements of heart failure symptoms. Three months after TAVI the patient presented with fever, dyspnoea and heart failure relapse to NYHA class III. Labwork showed high CRP levels (140mg/dl), positive blood cultures (Enterococcus faecalis), increased creatinine (2.27 mg/dl) and reduced GFR of 22 ml/min/1.73 m² and anemia (hemoglobin of 9.9g/dl). Echocardiography revealed severe paravalvular aortic regurgitation with a ‘rocking’ effect (Fig. 1A, 1B, 1C), non-coronary sinus aortic abscess with a reduced left ventricle ejection fraction of 40%. Medical treatment (targeted antibiotic therapy, inotropes, and diuretics) was unsuccessful, and the heart failure progressed to NYHA III/IV, so the Heart-Team decided to perform life-saving surgery. The estimated mortality risk was at 59.98% according to EuroSCORE II. During the reoperation in moderate hypothermia (34°C) the degenerated Hancock II with dehiscence of ¾ of its circumference and implanted Evolute R TAVI prostheses were removed (Fig. 1D). Due to the massive tissue destruction, Core-Matrix patch was used to reconstruct the LVOT. Next, the Medtronic Hancock 25 biological prosthesis was implanted (Fig. 1E). Additionally, the
dissected segment of the ascending aorta at the circumference of Evolute R crown was replaced with Vascutec Gelweave 32 vascular prosthesis (Fig. 1F). The extent and length of the procedure (170 minutes of clamped aorta), together with intraoperative complications and no possibility to appropriately protect the myocardium (no option to administer cardioplegia to the LIMA-LAD bridge) led, consequentially in the postoperative period, to refractory heart failure, multiorgan failure, and patient’s death. Even though TAVI has low 30-day (2.2-2.7%) and one-year (12.4-14.6%) mortality irrespective of the prosthesis used (balloon or self-expanding) the frequency of IE after TAVI amounts to 1.1% patients annually and has a poor prognosis [2-5]. In the case of IE in ViV TAVI with unsuccessful antibiotic therapy and instability of the prostheses, surgical reoperation remains the only possibility. Also, due to the expanding indications for TAVI and a growing number of treated patients worldwide, IE may become more frequent.

References


Fig 1A. Echocardiography imaging of implanted valvular prostheses - long axis.
Fig 1B. Echocardiography imaging of implanted valvular prostheses - short axis.
Fig 1C. Echocardiography imaging of implanted valvular prostheses after severe paravalvular regurgitation – long axis.
Fig 1D. Removed infected valvular prostheses.
Fig 1E. Implantation of Medtronic Hancock 25 valve to a reconstructed left ventricle tract.
Fig 1F. A fragment of the ascending aorta replaced with a vascular prosthesis.