The first pulmonary Venus valve implantation in Poland

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Since the first transcatheter valve implantation in Poland in 2008, we have implanted 115 Melody (available diameters from 18 to 22 mm) and Edwards-SAPIEN (SE) (available diameters from 23 to 29 mm) valves in patients with congenital heart defects with pulmonary valve dysfunction, after right ventricular outflow tract (RVOT) surgery [1, 2]. However, the use of these valves is impossible in the majority of patients after patch correction and severe pulmonary regurgitation, due to their RVOT diameters exceeding 29 mm. Implementation of Venus P-valve (Venus Medtech, Hangzhou, China) enables to perform the preferred transcatheter procedure [3] in a substantial group of patients [4, 5]. We present the first Venus pulmonary valve implantation in Poland, which took place in the Cardinal Wyszyński National Institute of Cardiology in Warsaw on February 15, 2023.

We describe a case of a 30-year-old man with tetralogy of Fallot, after total correction with a patch in 1994, with severe pulmonary regurgitation (pulmonary regurgitation fraction of 40% according to cardiac magnetic resonance [CMR]), severe right ventricular (RV) enlargement (CMR: RV end-diastolic volume/body surface area = 220 ml/m^2), and RV ejection fraction of 42%. He was disqualified from SE valve implantation because of the RVOT diameter exceeding 29 mm; however, CT measurements (Figure 1A) showed favorable anatomical conditions for Venus valve implantation.

The implantation was performed under general anesthesia, from the femoral venous approach. In pre-procedural planning, we used data from computed tomography, right heart catheterization with angiography, and balloon sizing with estimation of coronary anatomy in relation to the pulmonary artery. The minimal diameter of the "valve landing zone", measured by a balloon, was 27 mm (Figure 1B). A Venus self-expandable valve, 34 mm in diameter and 25mm long was implanted (Figure 1C–E, Supplementary material, *Video S1*). Repeated pressure measurements with angiography revealed a well-functioning valve without significant pressure gradient or regurgitation (Figure 1F, Supplementary material, *Video S2*).

One day after the procedure 2D echocardiography/Doppler showed an insignificant pulmonary pressure gradient (19/12 mm Hg) and mild central pulmonary regurgitation. The patient was discharged in good condition 48 hours after the valve implantation. We observed no procedural complications. Six months of dual antiplatelet therapy with acetylsalicylic acid (ASA) and clopidogrel, followed by lifelong ASA was recommended to prevent valve thrombosis.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

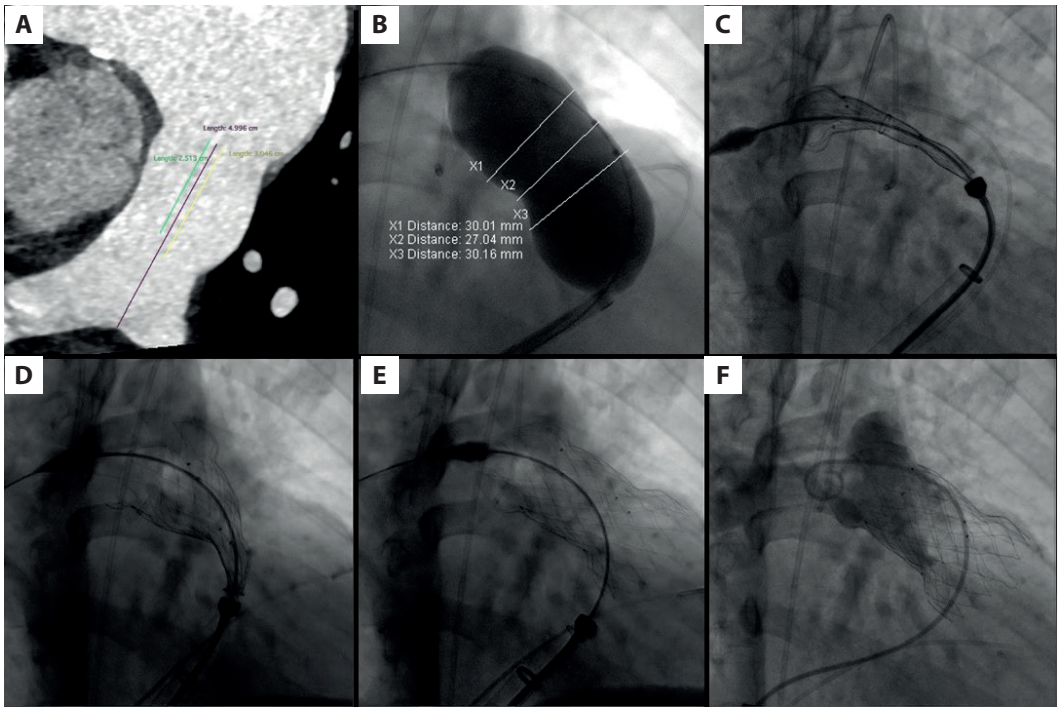

Figure 1. A. Computed tomography measurements of the main pulmonary artery before Venus valve implantation. **B.** Invasive balloon measurement — X1 on the level of the main pulmonary artery, X2 on the level of the pulmonary valve, and X3 on the level of the right ventricular outflow tract. **C, D.** Venus valve implantation — valve partially expanded. **E.** Venus valve implantation — valve fully expanded, released from the delivery system. **F.** Main pulmonary artery angiography after Venus valve implantation

Article information

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