

Successful transcatheter treatment of late complications after the Bentall procedure

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A 50-year-old man presented with symptoms of progressive exertional dyspnea. He had a history of bicuspid aortic valve stenosis with valve replacement at the age of 16 years (21-mm Bjork-Shiley mechanical valve). Due to the structural valve deterioration and progressive dilatation of the thoracic aorta, the Bentall procedure was performed 25 years later. A mechanical valved 23-mm St. Jude conduit was implanted. The postoperative period was complicated by infective endocarditis and reoperation was performed after 3 months with the implantation of a 25-mm Biovalsalva conduit. The patient remained asymptomatic until 2 months before the index hospitalization.

Diagnostic imaging (FIGURE 1A, 1C, and 1D; Supplementary material, *Video S1*) revealed a huge pseudoaneurysm, extending from the aortic valve to the distal anastomosis at the level of the brachiocephalic trunk. The pseudoaneurysmal cavity bordered with the right coronary ostium; however, surgical stitches from a previous coronary reimplantation probably prevented its further progression into that direction, since there were no clinical signs of myocardial ischemia. The ostia of the left and right coronary arteries were located 18 and 28 mm above the aortic annulus with no risk of closure after valve-in-valve implantation. The pseudoaneurysm cavity communicated with the left ventricular outflow tract through a 4 × 18 mm fistula just beneath the noncoronary side of the aortic annulus. Severe aortic regurgitation (pressure half-time, 215 ms, holodiastolic flow reversal in the ascending aorta with end-diastolic velocity >20 cm/s) resulting from the aortic

valve cusp prolapse was found on transthoracic and transesophageal echocardiography, together with the shunt from the left ventricle to the aneurysmal cavity.

In order to avoid another thoracotomy, transcatheter treatment was recommended. Because of the atypical anatomy, a 3-dimensional printed model was used for planning the procedure (FIGURE 1B). The angiographic working projection was calculated based on data from computed tomography angiography, and set at the angle perpendicular to both the aortic annulus and the fistula orifice.

The fistula was closed through an apical access, with simultaneous implantation of 2 Amplazer Vascular Plugs III (12 × 4 mm) through a 12F sheath, followed by the implantation of a 26-mm Sapien 3 valve (FIGURE 1F; Supplementary data, *Videos S2–S6*). Multislice computed tomography performed 3 days later revealed a thrombus occupying the larger part of the aneurysm (FIGURE 1E). There was no visible shunt on control echocardiography. After discharge, the patient remained asymptomatic and follow-up multislice computed tomography was scheduled 12 months after the procedure.

Although surgical re-do operations for pseudoaneurysm and structural valve deterioration are still the most common choice after the Bentall procedure,^{1,2} a growing number of patients will be treated endovascularly in the near future. In our opinion, nowadays, every case of a reintervention after previous heart valve surgery should be assessed by the heart team for a transcatheter treatment option, provided there are no signs of an active infection, when a surgical procedure is still warranted.³

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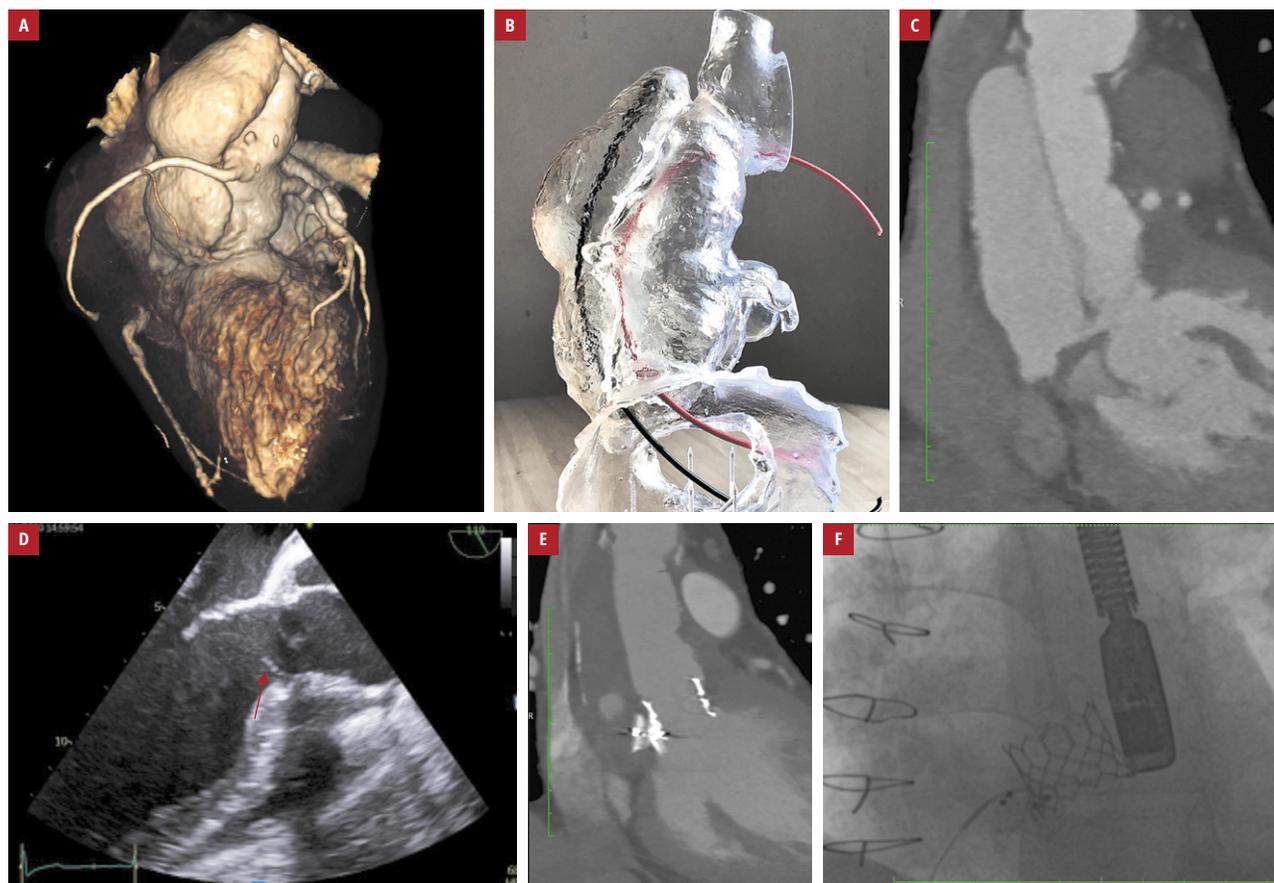


FIGURE 1 Imaging of the aortic root and the aneurysm before and after intervention; **A** – multislice computed tomography reconstruction of the heart and ascending aorta; **B** – 3-dimensional printed model with red probe inside the true lumen and black entering the aneurysmal cavity; **C** – multislice computed tomography showing the thrombosed aneurysmal cavity before intervention; **D** – transthoracic echocardiography image showing degenerated biological valve leaflet prolapse (arrow); **E** – multislice computed tomography showing the thrombosed aneurysmal cavity after intervention; **F** – final angiographic view after intervention

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

ARTICLE INFORMATION

CONFLICT OF INTEREST DJ is a proctor for Edwards Lifesciences, Meril Lifesciences. Other authors declare no conflict of interest.

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