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Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction (BASILICA) in valve-in-valve Transcatheter Aortic Valve Implantation (ViV-TAVI): First experience in Poland

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Short title: BASILICA in valve-in-valve TAVI: first experience in Poland

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Valve-in-valve Transcatheter Aortic Valve Implantation (ViV-TAVI) is an established treatment option for surgical bioprosthetic valve deterioration. Despite being less invasive than redo surgery, it may be accompanied by a risk of coronary obstruction, an uncommon but usually life-threatening adverse event [1, 2]. Traditional approaches to avoid coronary obstruction include intubation of coronary ostium at risk with guidewire or stent, however, rescue interventions are often unsuccessful and may lead to stent deformation, thrombosis, and ischemic complications. Unfortunately, emergency surgery is also a high mortality procedure [3]. Novel Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction (BASILICA) technique may be considered as an alternative approach, which prevents coronary

artery obstruction by splitting targeted leaflets in two and maintaining the blood flow through a gap in lacerated leaflet [4].

Herein we present a case of a 70-year-old man with exacerbation of chronic heart failure (New York Heart Association class III) caused by severe aortic regurgitation (AI ERO, 0.72 cm²; AI volume 107 ml, Vmax 3.9 m/s. PG mean/max 30/62 mm Hg, AVA VTI 1.2 cm², reversed flow in ascending aorta 21 cm/s) of failed 23 mm Trifecta GT (St. Jude Medical, St. Paul, MN, US), a stented valve with externally mounted bovine pericardial leaflets potentially interfering with the left main coronary artery ostium. Preoperative computed tomography showed a low take-off of the left coronary artery (4.9 mm, top at 10.9 mm), left coronary leaflet measuring 12.2 mm, virtual valve-to-coronary (VTC) distance of 3.2 mm, virtual valve-to-sinotubular junction (VTSTJ) distance of 1.7 mm, the annulus diameter of 18.2 mm, the sinus of Valsalva height of 12.8 mm. Taking into consideration numerous aggravating comorbidities (including chronic coronary artery syndrome in CCS2 class and history of LIMA-LAD coronary artery bypass grafting), worsening clinical symptoms, high operative risk (EuroSCORE II 18.5%), and high risk of left main coronary artery obstruction, the Heart Team qualified patient to 26 mm Evolut R (Medtronic, Minneapolis, MN, US) ViV-TAVI with BASILICA procedure to protect the perfusion area of the circumflex artery.

The procedure was performed under general anesthesia with right ventricular pacing lead placed through the right internal jugular vein. Sentinel™ Cerebral Protection System (Claret Medical, Santa Rosa, CA, US) was positioned in the brachiocephalic trunk and left carotid artery to reduce the embolic risk of catheter manipulations and leaflet laceration debris. BASILICA snare was positioned in the left ventricle outflow tract and the transversal catheter was positioned and aimed in fluoroscopic side and midline projections to perform puncture of the left coronary leaflet. The leaflet was punctured using 50 W electrosurgical energy, subsequently the wire was snared and externalized. Then, after achieving V-shape at the leaflet level, 50W electrosurgical energy was applied again and the whole system was pulled to lacerate the targeted leaflet. Next, successful ViV-TAVI with self-expandable 26 mm Evolut R was performed, subsequent angiography showed undisturbed blood flow to the left coronary artery. Postoperative echocardiography showed good hemodynamic results and correct function of the implanted bioprosthesis, BASILICA procedure is a novel and challenging technique that requires numerous steps to complete, hence it should ideally be performed by experienced operators in high-volume centers or under the supervision of

experienced proctor [5]. It is feasible and often the only way of treatment for specific patients with unfavorable coronary artery anatomy and the necessity of transcatheter aortic valve implantation. Specifically designed devices for leaflet laceration are needed for the simplification and broader availability of this approach.

Supplementary material

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

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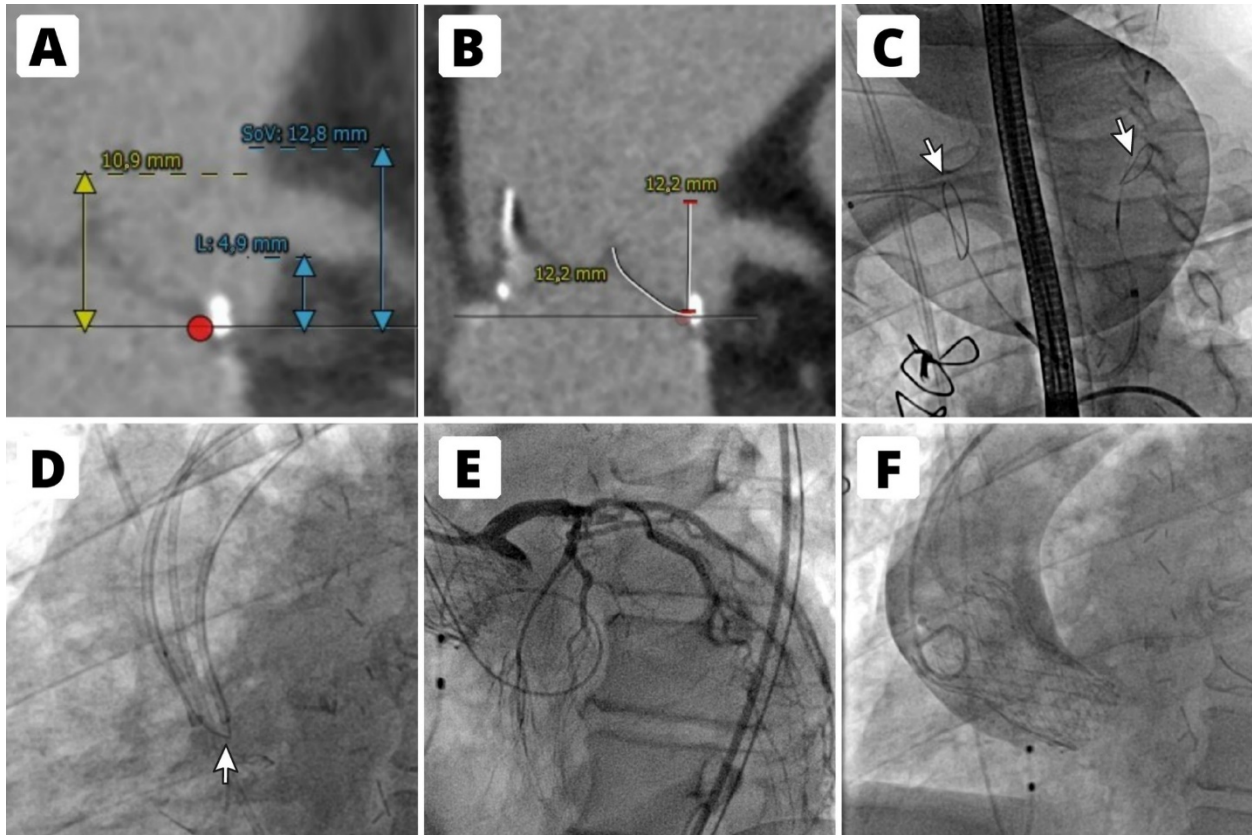


Figure 1. **A.** Preoperative computer tomography measurements of left coronary artery and sinus of Valsalva. **B.** Preoperative computer tomography measurements of left coronary leaflet. **C.** Successful implantation of the Sentinel™ Cerebral Protection System in the brachiocephalic trunk and left carotid artery. **D.** V-shaped wire passing through left coronary leaflet and ready to lacerate. **E.** Postoperative angiography showing preserved blood flow to left coronary artery. **F.** Angiography after effective valve-in-valve transcatheter aortic valve implantation of 26 mm Evolut R into failed 23mm Trifecta GT