

Valve-in-valve Matryoshka doll

Antonio Hanžek^{1*},
Vlatka Rešković Lukšić¹,
Joško Bulum^{1,2},
Zvonimir Ostojić¹,
Sandra Jakšić Jurinjak^{1,2},
Blanka Glavaš Konja¹,
Marija Brestovac¹,
Jadranka Šeparović Hanževački^{1,2}

¹University Hospital Centre
Zagreb, Zagreb, Croatia

²University of Zagreb, School
of Medicine, Zagreb, Croatia

KEYWORDS: aortic stenosis, transcatheter aortic valve replacement, valve-in-valve, echocardiography.

CITATION: Cardiol Croat. 2025;20(5-6):134-5. | <https://doi.org/10.15836/ccar2025.134>

***ADDRESS FOR CORRESPONDENCE:** Antonio Hanžek, Klinički bolnički centar Zagreb, Kišpatićeva 12, HR-10000 Zagreb, Croatia. / Phone: +385-98-9426-056 / E-mail: antoniohanzek0@gmail.com

ORCID: Antonio Hanžek, <https://orcid.org/0000-0003-2308-3518> • Vlatka Rešković Lukšić, <https://orcid.org/0000-0002-4721-3236> Joško Bulum, <https://orcid.org/0000-0002-1482-6503> • Zvonimir Ostojić, <https://orcid.org/0000-0003-1762-9270> Sandra Jakšić Jurinjak, <https://orcid.org/0000-0002-7349-6137> • Blanka Glavaš Konja, <https://orcid.org/0000-0003-1134-4856> Marija Brestovac, <https://orcid.org/0000-0003-1542-2890> • Jadranka Šeparović Hanževački, <https://orcid.org/0000-0002-3437-6407>

Introduction: Transcatheter aortic valve replacement (TAVR) is a well-established procedure for the treatment of severe aortic stenosis (AS)¹. Durability of those valves is still an issue concerning structural degeneration with obstruction or severe regurgitation (AR). Based on the limited literature, TAVR-in-TAVR seems to be a valid option in such cases².

Case report: 80-year-old female who previously underwent implantation of a bioprosthetic valve (Labcor 23) in 2014 for severe AS presented to our Department in 2021 for evaluation of severe paravalvular and intravalvular AR and secondary valvular cardiomyopathy with reduced left ventricular ejection fraction (LVEF). At first, she was planned for re-do surgery but was declined by the Heart team due to high periprocedural risk. As an alternative, she was treated with valve-in-valve TAVR, followed by a cardiac resynchronization device implantation in November 2021. During follow-up, she had frequent spells of fast atrial fibrillation accompanied by acute heart failure episodes and was eventually treated with atrioventricular node ablation in May 2023. In July 2024, combined transthoracic and transesophageal echocardiography revealed severe intravalvular AR (**Figure 1**), presumably due to damaged struts, with significant paravalvular leak (**Figure 2**), confirmed by a cardiac computed tomography scan. Based on the anatomical features, the Heart Valve Team concluded that the patient was suitable for the implantation of additional prosthesis in the form of the TAVR-in-TAVR technique. The procedure was successfully performed in October of 2024, with the implantation of the Edwards Sapien S3 valve (size 23). The new valve was positioned deeper in the left ventricular outflow tract, without impeding the anterior mitral cusp motion, and without coronary ostia obstruction (**Figure 3**). Postprocedural imaging revealed a significant reduction of AR, now only moderate in severity, with improved LVEF and without significant obstruction of forward flow (mean pressure gradient (PG) of 16 mmHg, and peak PG of 33 mmHg). Based on the last ambulatory visit, the patient is doing well.

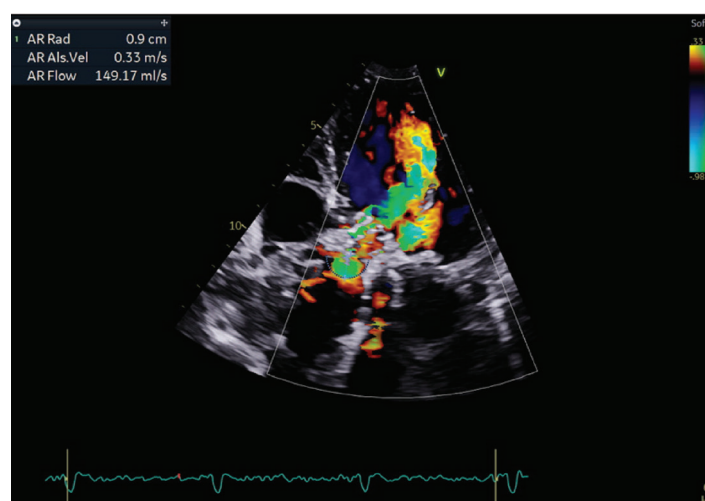


FIGURE 1. Severe intravalvular aortic regurgitation (transthoracic echocardiography).

RECEIVED:
March 16, 2025

ACCEPTED:
April 2, 2025



Conclusion: Transcatheter treatment for the failing TAVR seems to be a reasonable option for properly selected patients. Proper preprocedural planning with multimodality imaging is paramount to prevent specific periprocedural complications, such as acute coronary obstruction³.

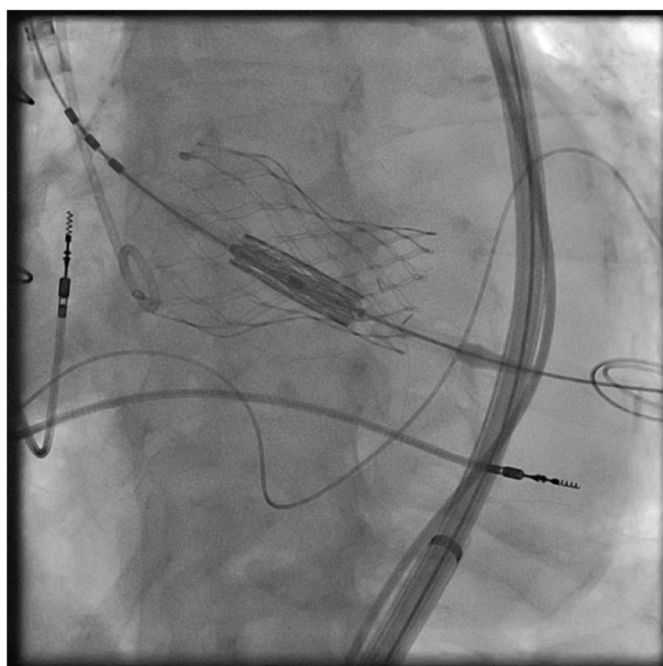
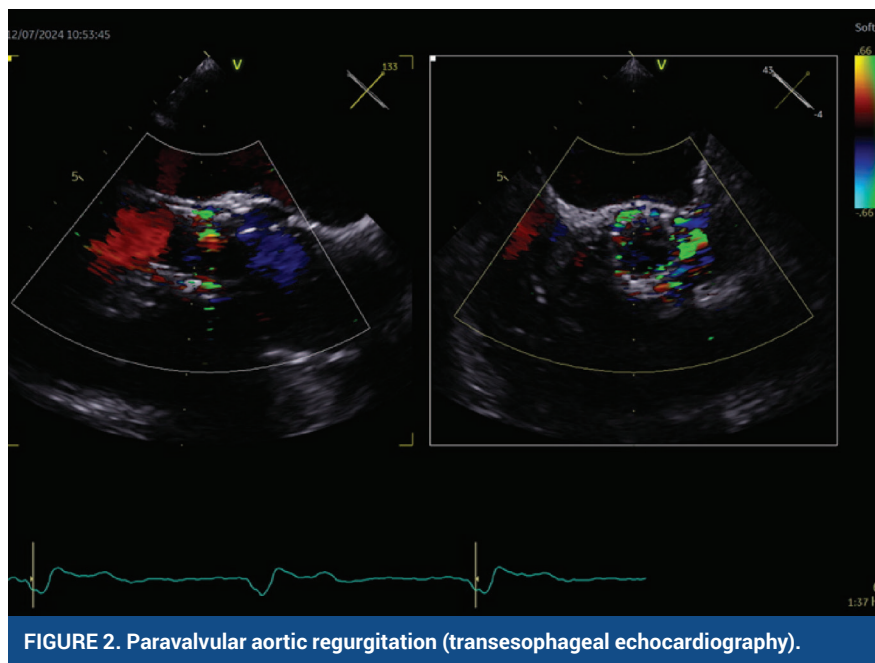


FIGURE 3. Position of the new transcatheter aortic valve (diascopy).

LITERATURE

1. Mahmalji H, Tawney A, Young M. Transcatheter Aortic Valve Replacement. 2023 Jul 24. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. PubMed: <https://pubmed.ncbi.nlm.nih.gov/28613729/>
2. Gallo M, Fovino LN, Blitzler D, Doulami IP, Guariento A, Salvador L, et al. Transcatheter aortic valve replacement for structural degeneration of previously implanted transcatheter valves (TAVR-in-TAVR): a systematic review. Eur J Cardiothorac Surg. 2022 May 2;61(5):967-976. <https://doi.org/10.1093/ejcts/ezab443>
3. Tarantini G, Fabris T, Nai Fovino L. TAVR-in-TAVR and coronary access: importance of preprocedural planning. EuroIntervention. 2020 Jun 12;16(2):e129-e132. <https://doi.org/10.4244/EIJ-D-19-01094>