

# Transcatheter tricuspid valve-in-valve replacement due to severe bioprosthesis dysfunction in a patient with endocardial leads

Karolina Plaskota<sup>1</sup>, Marcin Demkow<sup>2</sup>, Ilona Michałowska<sup>3</sup>, Maciej Sterliński<sup>4</sup>, Mirosław Kowalski<sup>1</sup>, Piotr Hoffman<sup>1</sup>

<sup>1</sup>Department of Adult Congenital Heart Disease, National Institute of Cardiology, Warszawa, Poland

<sup>2</sup>Department of Coronary and Structural Heart Disease, National Institute of Cardiology, Warszawa, Poland

<sup>3</sup>Department of Radiology, National Institute of Cardiology, Warszawa, Poland

<sup>4</sup>1<sup>st</sup> Department of Arrhythmia, National Institute of Cardiology, Warszawa, Poland

## Correspondence to:

Karolina Plaskota, MD, PhD,  
Department of Adult Congenital  
Heart Disease,  
National Institute of Cardiology,  
Alpejska 42, 04–462 Warszawa,  
Poland,  
phone: +48 22 343 44 00,  
e-mail: kplaskota@ikard.pl

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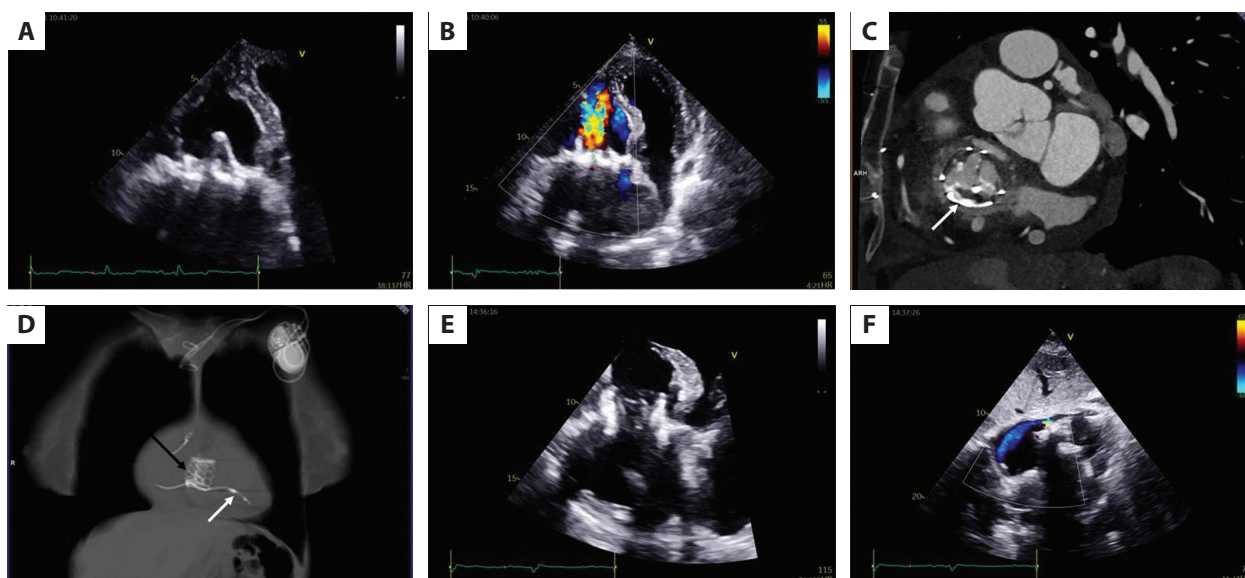
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The safety and efficacy of transcatheter valve-in-valve implantation have led to the rapid growth of this treatment strategy especially in high surgical risk patients with aortic valve prosthetic dysfunction [1]. Although less proven, transcatheter tricuspid valve-in-valve replacement has also good short-term outcomes. Performing such a procedure in patients with endocardial leads poses an additional risk. Potential concerns include the impact of the pacemaker lead on the valve deployment, the presence and the extent of the perivalvular leak along with the pacemaker lead, and the risk of jailed lead dysfunction during the procedure and in the long-term follow-up [2–5].

A 59-year-old female patient with Ebstein's anomaly, after surgical tricuspid valve replacement with a 31-mm Carpentier-Edwards bioprosthesis due to severe tricuspid regurgitation in 1987, after dual-chamber pacemaker implantation due to symptomatic second-degree atrioventricular heart block in 2003 was regularly followed-up in our outpatient clinic. From the beginning of 2021, she gradually started to present heart failure symptoms (exertional dyspnea with nausea and lower extremity edema) ultimately in class III according to the New York Heart Association classification. Laboratory tests revealed increased serum N-terminal prohormone for brain natriuretic peptide concentration of 1526 pg/ml (in comparison to 669 pg/ml a year before). Transthoracic

echocardiographic examination demonstrated tricuspid bioprosthesis dysfunction with a mean transvalvular gradient of 14.5 mm Hg and a small perivalvular leak in the lateral part of the tricuspid ring, the enlarged right ventricle with a preserved systolic function, and severely enlarged right atrium (Figure 1A, B). Cardiac computed tomography confirmed the diagnosis (Figure 1C). Taking into consideration prior sternotomy, benign thrombocytopenia, and her new affiliation with Jehovah's witness group, the Heart Team decided to refer her for percutaneous valve-in-valve implantation with right ventricle lead jailing. Pre-procedural pacemaker interrogation showed 88% pacing with underlying sinus rhythm with second to third-degree atrioventricular block resulting in the heart rate of 40–65 bpm, dual-chamber pacing mode, and correct right ventricle lead threshold. The patient underwent tricuspid valvuloplasty with a 25-mm Edwards balloon followed by valve-in-valve 29-mm Sapien 3 bioprosthesis implantation via the right femoral approach. The procedure was complicated by a femoral vein bleeding with an extensive hematoma and a hemoglobin concentration decrease not requiring blood transfusion. There were no changes in the device function in the post-procedural interrogation. Multimodality imaging using transthoracic echocardiography and cardiac computed tomography revealed correct position and good function of the bioprosthesis with a mean transvalvular



**Figure 1.** **A.** Transthoracic echocardiography. Four-chamber apical zoom view. Degenerated leaflets of the tricuspid bioprosthesis. **B.** Transthoracic echocardiography. Four-chamber apical view. Color Doppler flow. Turbulent flow through degenerated leaflets of the tricuspid bioprosthesis. **C.** Cardiac computed tomography. Multiplanar reconstruction, short-axis view. Bioprosthetic tricuspid valve degeneration (the arrow) — thickening and calcifications of the valve leaflets. **D.** Cardiac computed tomography after reimplantation of the tricuspid valve. Multiplanar reconstruction. Tricuspid valve bioprosthesis (the black arrow), pacemaker lead (the white arrow). **E.** Transthoracic echocardiography after the valve-in-valve procedure. Four-chamber apical zoom view. Correct position of the tricuspid valve-in-valve bioprosthesis. **F.** Transthoracic echocardiography after the valve-in-valve procedure. Substernal long-axis view. Color Doppler flow. Mild perivalvular leak in the lateral part of the tricuspid ring in the surrounding of the ventricular lead

gradient of 3.4 mm Hg and a mild perivalvular leak in the lateral part of the tricuspid ring in the surrounding of the ventricular lead (Figure 1D–F). At a three-month follow-up, the patient was free from heart failure symptoms, and her hemoglobin concentration was stable at the level of 13.3 g/dl.

Transcatheter tricuspid valve-in-valve implantation is a safe alternative to redo surgical tricuspid valve replacement, especially in high surgical risk patients. Reported data show that jailing of the right ventricle lead does not cause a severe perivalvular leak or pacemaker dysfunction in the short-term follow-up. Yet, more studies are required to evaluate long-term outcomes.

**Article information**

**Conflict of interest:** None declared.

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