

Transcatheter mitral valve replacement with Tendyne™ Device: overview of three-dimensional echocardiography monitoring

Vincenzo Polizzi¹, Amedeo Pergolini¹, Giordano Zampi², Giulio Cacioli¹, Daniele Pontillo³, Francesco Musumeci¹

¹Department of Cardiovascular Science "S. Camillo-Forlanini" Hospital, Rome, Italy

²Department of Cardiology, Belcolle Hospital, Viterbo, Italy

³Cardiac Intensive Care Unit, Belcolle Hospital, Viterbo, Italy

Correspondence to:

Giordano Zampi, MD,
Department of Cardiology,
Belcolle Hospital,
Strada Sammartinese s.n.c.,
01100, Viterbo, Italy
phone:
+39 0761 339 435/278,
e-mail:
giordano.zampi@alice.it

Copyright by the Author(s),
2021

Kardiol Pol. 2021;
79 (10): 1161–1162;
DOI: 10.33963/KPa2021.0080

Received:

June 16, 2021

Revision accepted:

August 4, 2021

Published online:

August 4, 2021

A 77-year-old Caucasian male with post-ischemic dilated cardiomyopathy was referred to our Emergency Department with recurrent acute pulmonary edema. He reported multiple previous hospitalizations for heart failure despite maximal tolerated medical therapy.

Echocardiography showed a dilated left ventricle with systolic dysfunction and severe secondary mitral regurgitation (left ventricular end diastolic volume of 135 ml/m²; ejection fraction of 25%; effective regurgitant orifice area of 0.42 cm²; regurgitant fraction of 53%). These features, together with the above-mentioned clinical history, posed a very high surgical risk to the patient in the absence of feasibility criteria for a percutaneous edge-to-edge mitral valve repair ("proportionate" mitral valve regurgitation with inadequate coaptation length, borderline valve area). Therefore, our local Heart Team suggested the procedure of a transcatheter mitral valve replacement as an alternative therapeutic option [1].

The Tendyne Mitral Valve System (Tendyne Holdings, LLC, a subsidiary of Abbott Vascular, Roseville, MN, USA) consists of a delivery system, an 18 G needle; a 36 French sheath and a D-shaped tri-leaflet porcine pericardial valve, supported by a synthetic circular inner frame. The replacement procedure is performed by a trans-apical approach. An alternative hybrid technique for transcatheter mitral valve replacement has been previously adopted with success in a different high-risk setting, such as infective endocarditis in pediatric patients [2].

In this surgical setting, echocardiography plays a paramount role both in procedure planning and intra-operative monitoring. Initially, after having identified the thoracic access, the sheath is inserted rigorously orthogonally to the mitral annulus plane (Figure 1A). Subsequently, the sheath is advanced and stopped 1 cm above the mitral annulus (Figure 1B), and the valve is finally deployed (Figure 1C–D).

Postprocedural transesophageal echocardiography showed correct valve seating with no residual motion of the prosthesis and no left ventricular outflow tract obstruction (Figure 1E–F).

This case underscores the paramount relevance of 3D echocardiographic monitoring in interventional cardiology in order to achieve the most favorable procedural outcomes.

Article information

Acknowledgments: IRB approval, consent statement and clinical trial registration are not applicable for this study.

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Conflict of interest: None declared.

Open access: This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially. For commercial use, please contact the journal office at kardiologiapolska@ptkardio.pl.

How to cite: Polizzi V, Pergolini A, Zampi G, et al. Transcatheter mitral valve replacement with Tendyne™ Device: overview of three-dimensional echocardiography monitoring. *Kardiol Pol.* 2021; 79(10): 1161–1162, doi: 10.33963/KPa2021.0080.

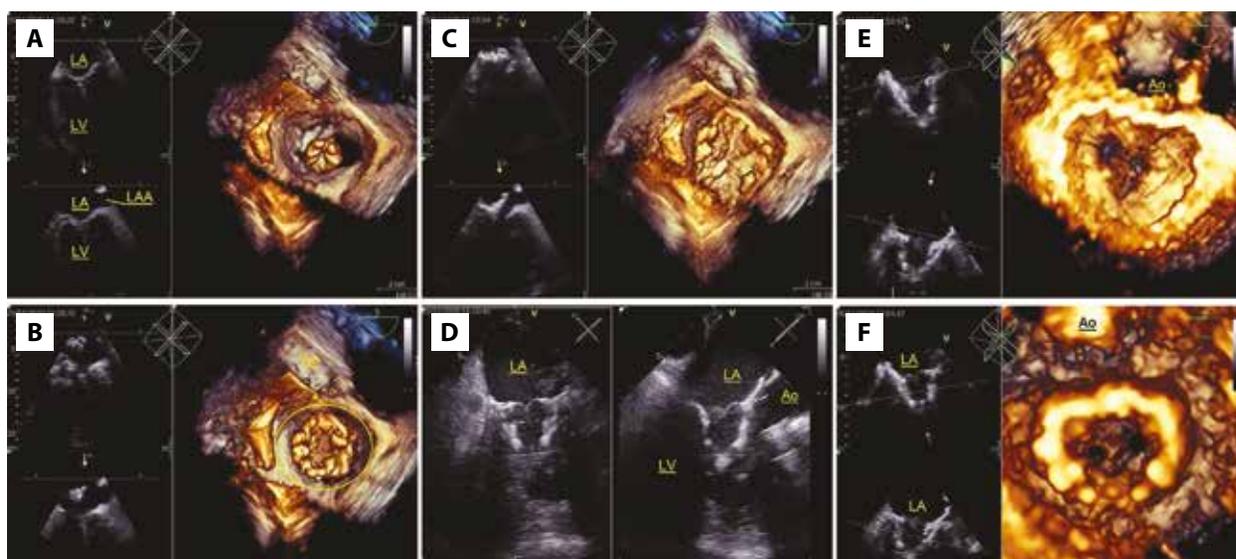


Figure 1. **A.** Transesophageal echocardiography, biplanar imaging, obtained from inter commissural view showing the Tendyne valve partially deployed within the mitral annulus. **B.** 3D transesophageal echocardiography surgeon's view, showing sheath positioning (asterisk showing the part facing LVOT; circle showing the D-shape of the valve). **C.** 3D transesophageal echocardiography en face (surgeon's view). Valve clocking (determining the radial orientation of the valve) should be performed to align the anterior cuff of Tendyne with A2 scallop, along the anterior atrial wall and behind the aortic valve. **D.** Transesophageal echocardiography, orthogonal biplanar imaging obtained from inter commissural view (left panel) showing the correct valve seating with no residual motion of the prosthesis and no LVOT obstruction (right panel: long axis view). **E.** 3D transesophageal echocardiography en face (surgeon's view) — the final result. **F.** 3D transesophageal echocardiography ventricular view showing the final result

Abbreviations: Ao, aorta; LA, left atrium; LAA, left atrial appendage; LV, left ventricle

REFERENCES

1. Muller DWM, Farivar RS, Jansz P, et al. Tendyne Global Feasibility Trial Investigators. Transcatheter mitral valve replacement for patients with symptomatic mitral regurgitation: a global feasibility trial. *J Am Coll Cardiol.* 2017; 69(4): 381–391, doi: [10.1016/j.jacc.2016.10.068](https://doi.org/10.1016/j.jacc.2016.10.068), indexed in Pubmed: 28040318.
2. Haponiuk I, Chojnicki M, Paczkowski K, et al. Pediatric Melody mitral valve replacement in acute endocarditis: 2 consecutive cases operated on with an alternative hybrid technique. *Kardiol Pol.* 2020; 78(1): 75–77, doi: [10.33963/KP.15132](https://doi.org/10.33963/KP.15132), indexed in Pubmed: 31922500.