

Images in Cardiovascular Medicine



Perioperative Detection of Paravalvular Leak After Sutureless Aortic Valve Replacement

Yan-Cheng Chen , MD^{1,*}, Tzu-Yu Lin , PhD^{1,2}, and Cheng-Wei Lu , PhD^{1,2,*}

¹Department of Anesthesiology, Far Eastern Memorial Hospital, New Taipei City, Taiwan

²Department of Mechanical Engineering, Yuan Ze University, Taoyuan City, Taiwan

OPEN ACCESS

Received: Jul 20, 2022

Revised: Aug 9, 2022

Accepted: Aug 24, 2022

Published online: Oct 12, 2022

Correspondence to

Yan Cheng Chen, MD

Department of Anesthesiology, Far Eastern Memorial Hospital, Number 21, Section 2, Nanya South Road, Banqiao District, New Taipei City, Taiwan.

Email: chenyancheng0904@gmail.com

*Yan-Cheng Chen and Cheng-Wei Lu contributed this article equally.

Copyright © 2022. The Korean Society of Cardiology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Yan-Cheng Chen

<https://orcid.org/0000-0002-2154-2138>

Tzu-Yu Lin

<https://orcid.org/0000-0002-1374-5189>

Cheng-Wei Lu

<https://orcid.org/0000-0002-2217-3231>

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The authors have no financial conflicts of interest.

A 65-year-old woman presented to hospital with progressive exertional dyspnea. Transthoracic echocardiography (TTE) revealed severe aortic stenosis with estimated aortic valve area 0.85 cm² (aortic valve annulus diameter: 23 mm). Minimally invasive cardiac surgery with sutureless aortic valve (perceval valve size M) replacement (SU-AVR) via right mini-parasternotomy was performed. After replacement, transesophageal echocardiography (TEE) revealed paravalvular leak (PVL) near the right coronary cusp (**Figure 1A-C**). Then, stent

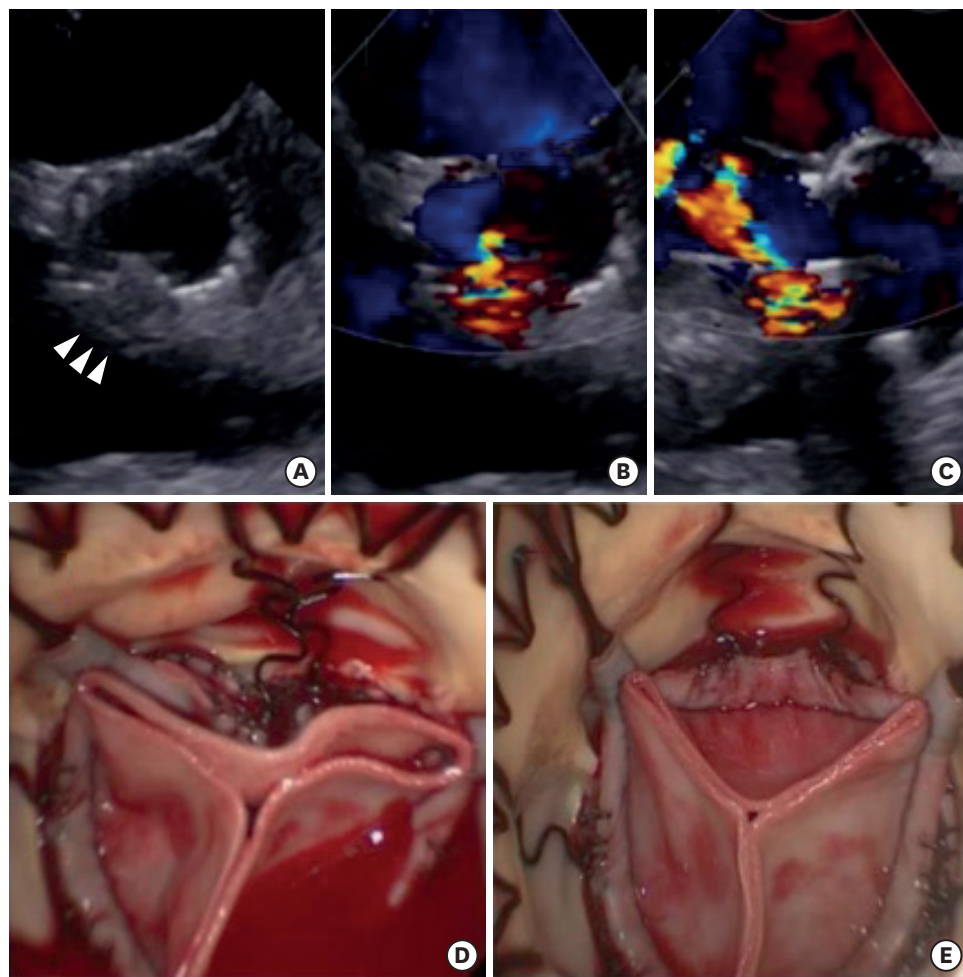


Figure 1. Arrow heads indicate distortion of a Perceval sutureless aortic valve stent (A). Aortic valve short axis view (B) and long axis view (C) showed PVL. Surgical images before revision (D) and after revision (E). PVL = paravalvular leak.

Data Sharing Statement

The data generated in this study is available from the corresponding author upon reasonable request.

Author Contributions

Conceptualization: Chen YC, Lin TY, Lu CW; Supervision: Lin TY, Lu CW; Validation: Chen YC, Lu CW; Visualization: Chen YC, Lu CW; Writing - original draft: Chen YC; Writing - review & editing: Chen YC, Lu CW.

inversion was confirmed by surgeon (**Figure 1D**). After surgical revision by adjustment of the inverted stent (**Figure 1E**), no PVL was detected afterward. We had obtained informed consent from the patient.

SU-AVR is associated with improved hemodynamics when compared with conventional AVR.¹⁾ Rarely, the PVL of SU-AVR results from stent distortion due to oversizing or malposition of the implanted valve.²⁾ TEE is a useful tool to confirm the diagnosis of PVL and multimodality imaging is essential to detect and quantify PVL.³⁾ Careful investigation of postoperative TEE and TTE helped physicians to detect the possibility of PVL or other cardiac abnormalities.

REFERENCES

1. Bilkhu R, Borger MA, Briffa NP, Jahangiri M. Sutureless aortic valve prostheses. *Heart* 2019;105:s16-20. [PUBMED](#) | [CROSSREF](#)
2. Baert J, Astarci P, Noirhomme P, de Kerchove L. The risk of oversizing with sutureless bioprosthesis in small aortic annulus. *J Thorac Cardiovasc Surg* 2017;153:270-2. [PUBMED](#) | [CROSSREF](#)
3. Bernard S, Yucel E. Paravalvular leaks-from diagnosis to management. *Curr Treat Options Cardiovasc Med* 2019;21:67. [PUBMED](#) | [CROSSREF](#)