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Transcatheter aortic valve implantation after transcatheter mitral valve implantation

Short title: TAVI after TMVI

Elmar W. Kuhn¹, M.D; Volker Rudolph², M.D; Stephan Baldus³, M.D; Matti Adam³, M.D

1 – Department of Cardiothoracic Surgery, Heart Center of the University of Cologne, Cologne, Germany

2 – General and Interventional Cardiology, HDZ NRW Bad Oeynhausen, Ruhr University Bochum, Germany

3 – Department of Cardiology, Heart Center of the University of Cologne, Cologne, Germany

Corresponding author:

Elmar W. Kuhn, M.D.

Department of Cardiothoracic Surgery

Heart Center of the University of Cologne

Kerpener Str. 62, 50924 Cologne, Germany

Email: elmar.kuhn@uk-koeln.de

Classifications

- Prior cardiovascular surgery
- Aortic stenosis
- Mitral valve disease
- Degenerative valve
- Imaging modalities
- TAVI

Conflict of interest statement

The authors have no conflicts of interest to declare.

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A patient was admitted with dyspnea after prior transcatheter mitral valve implantation (TMVI, Edwards Lifesciences, CardiAQ) [1]. Echocardiography showed a good result after TMVI but revealed a low-flow low-gradient aortic valve stenosis on the basis of valvular calcification.

The patient was accepted for transcatheter aortic valve implantation (TAVI). Protrusion of left ventricular anchors of the CardiAQ into the left ventricular outflow tract (LVOT; **figure 1A**) challenged the use of a balloon-expandable prosthesis since the stiffness of the CardiAQ was unpredictable. Simulated implantation using a self-expandable prosthesis (**figure 1B, moving image 1**) illustrated the optimal position. Transfemoral implantation of a 34 mm CoreValve® Evolut™ prosthesis (Medtronic, Minneapolis, USA) was planned.

Intraprocedural echocardiography revealed trivial paravalvular leak, maximal pressure gradient of 9 mmHg and no alteration of the CardiAQ prosthesis (**figure 1C**).

After two months, the patient presented with clinical improvement. CT analysis and echocardiography confirmed the desired position with no interaction with the CardiAQ valve (**figure 1D; moving image 2**).

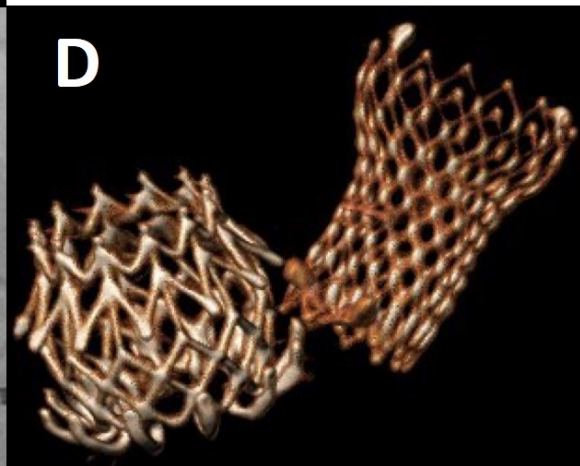
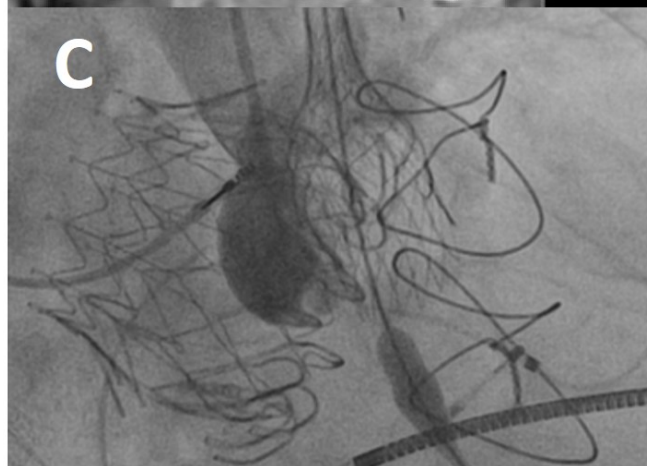
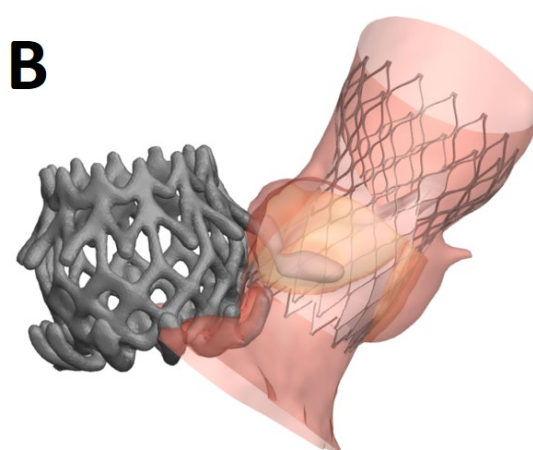
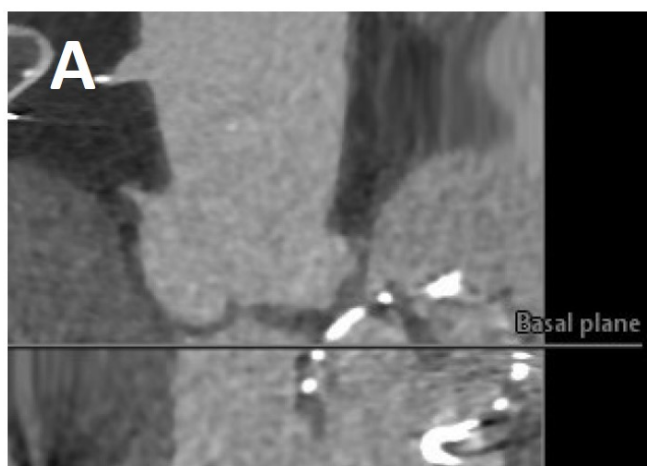
Various devices have been successfully implanted in patients with prior MV surgery; mitral valve prostheses were identified as risk factor for TAVI-device embolization [2]. This case presented with protruded mitral prosthesis into the LVOT. Preprocedural simulation was helpful to assess the optimal position of the prosthesis. Intraprocedural post-dilatation would have been performed in case of a relevant paravalvular leak using a larger balloon but was not necessary since optimal positioning with further expansion of the valve due to the nitinol frame resulted in a good primary result.

Figure legends

- A** – Preprocedural CT-scan illustrating a protrusion of the CardiAQ prosthesis into the LVOT.
- B** – Preprocedural simulated implantation of Evolut prosthesis (FEops TAVIguide™, Belgium).
- C** – Intraoperative fluoroscopic view with partial deployment of the prosthesis.
- D** – Postprocedural CT-scan analysis using 3mensio (Medical Imaging, Netherlands) showing the final position of the two prostheses.

References

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Supplementary material

Moving Image 1

Pre-procedural simulation based on the routine computer tomography of the aortic root to assess the optimal positioning of the Evolut R prosthesis in relationship to the CardiAQ valve illustrated using FEops TAVIguide™ software.

Moving Image 2

Parasternal long-axis echocardiographic view at two-month follow-up showing good flow patterns of both the mitral and aortic valve prostheses and with trivial paravalvular leak of the aortic prosthesis.