

IMAGES IN INTERVENTION

Transseptal Closure of Left Ventricular Pseudoaneurysm Post-Transapical Transcatheter Aortic Valve Replacement



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An 81-year-old woman presented for a scheduled 1-month follow-up after an uneventful valve-in-valve transapical transcatheter aortic valve replacement (TA-TAVR) using a 23-mm Sapien XT prosthesis (Edwards Lifesciences, Irvine, California). Although the patient remained asymptomatic after discharge, a transthoracic echocardiogram revealed a left ventricular (LV) pseudoaneurysm, with a 10-mm neck, at the location of the transapical

access site (Figure 1A, Online Video 1). Subsequent heart team discussion led to the decision to proceed with percutaneous closure via an antegrade transseptal approach. The procedure was performed under general anesthesia and transesophageal echocardiographic guidance. Following transseptal puncture, an 8-F Mullins sheath was further advanced into the LV through the mitral valve with a support of a 6-F balloon floating catheter, and then an initial LV

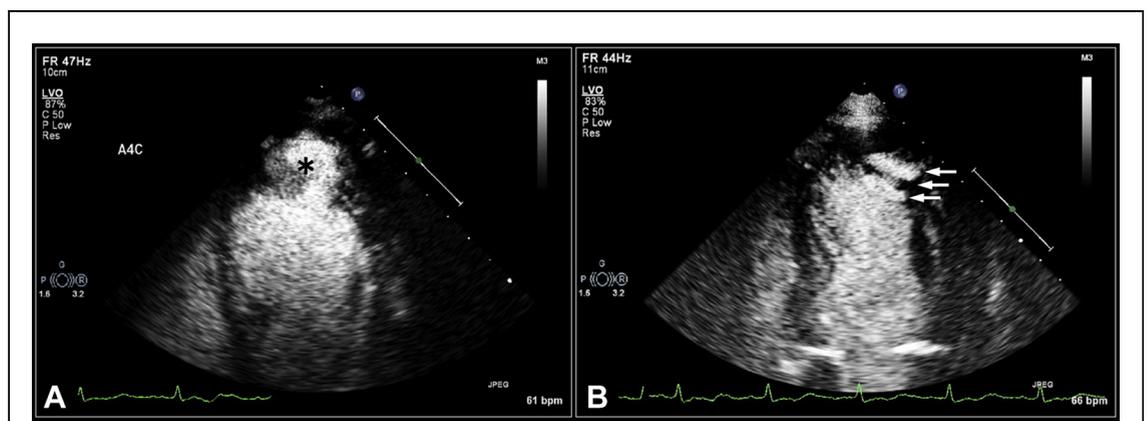


FIGURE 1 Transthoracic Echocardiogram With Contrast (Apical 4-Chamber View)

(A) Transthoracic echocardiogram with contrast at 1-month follow-up post-transapical transcatheter aortic valve replacement revealed a left ventricular (LV) pseudoaneurysm (asterisk) with a neck (Online Video 1). (B) Transthoracic callouts echocardiogram with contrast after pseudoaneurysm closure showed a well-seated 12-mm Amplatzer Muscular ventricular septal defect occluder (white arrows) across the neck of the LV pseudoaneurysm without significant shunt (Online Video 2).

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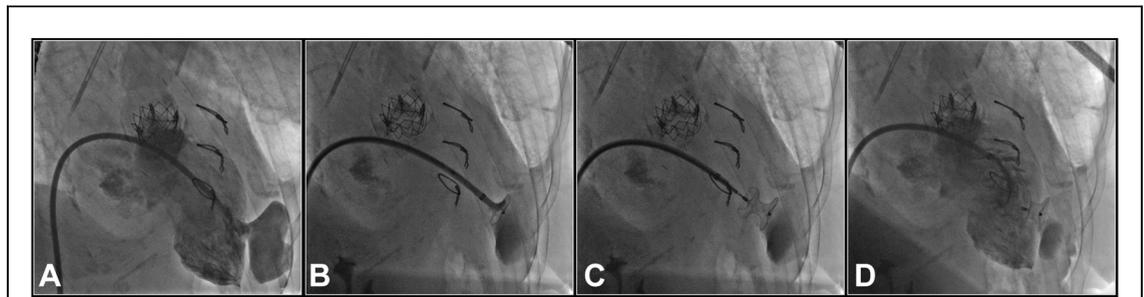


FIGURE 2 Cine Angiography

(A) Initial left ventriculogram demonstrated left ventricular (LV) pseudoaneurysm with a neck. (B) A distal disk of the occluder device was deployed. (C) A proximal disk of the occluder device was deployed. (D) The final left ventriculogram showed occlusion of the pseudoaneurysm with the 12-mm Amplatzer Muscular ventricular septal defect occluder.

angiogram was performed (Figure 2A). A 6-F multipurpose catheter was manipulated into the pseudoaneurysm; the catheter was then exchanged for an 80-cm 8-F Amplatzer TorqVue sheath (St. Jude Medical, Minneapolis, Minnesota). On the basis of echocardiographic and balloon-sizing measurement, a 12-mm Muscular ventricular septal defect occluder (St. Jude Medical) was prepared in standard fashion and deployed successfully (Figures 2B and 2C). The final angiogram showed a well-seated device without significant shunt (Figure 2D). At discharge (post-operative day 2), a transthoracic echocardiogram showed the occluder device completely sealing the pseudoaneurysm (Figure 1B, Online Video 2).

LV pseudoaneurysm is a rare but serious complication after TA-TAVR (1). Percutaneous pseudoaneurysm

closure after TA-TAVR via a retrograde transfemoral approach was previously reported (2), but this technique has some concerns, including the long access route to the LV apex and potential risk of valve injury. By contrast, the antegrade transseptal approach provides an appropriate access route, allowing the usage of a standard delivery system for the occluder device, and eliminates the risk of damaging the implanted valve. Therefore, it is suggested that the present technique be considered as the first-line option for LV pseudoaneurysm closure after TA-TAVR.

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REFERENCES

1. Pasic M, Unbehaun A, Dreyse S, et al. Transapical aortic valve implantation in 175 consecutive patients: excellent outcome in very high-risk patients. *J Am Coll Cardiol* 2010;56:813-20.
2. Bortnick AE, Gordon E, Gutsche J, et al. Percutaneous closure of a left ventricular pseudoaneurysm after Sapien XT transapical transcatheter aortic valve replacement. *J Am Coll Cardiol Intv* 2012;5:e37-8.

KEY WORDS left ventricular pseudoaneurysm, percutaneous closure, transcatheter aortic valve replacement, transseptal approach

APPENDIX For the supplemental videos, please see the online version of this article.