

IMAGES IN INTERVENTION

# Percutaneous Closure of Peridevice Leak After Left Atrial Appendage Occlusion



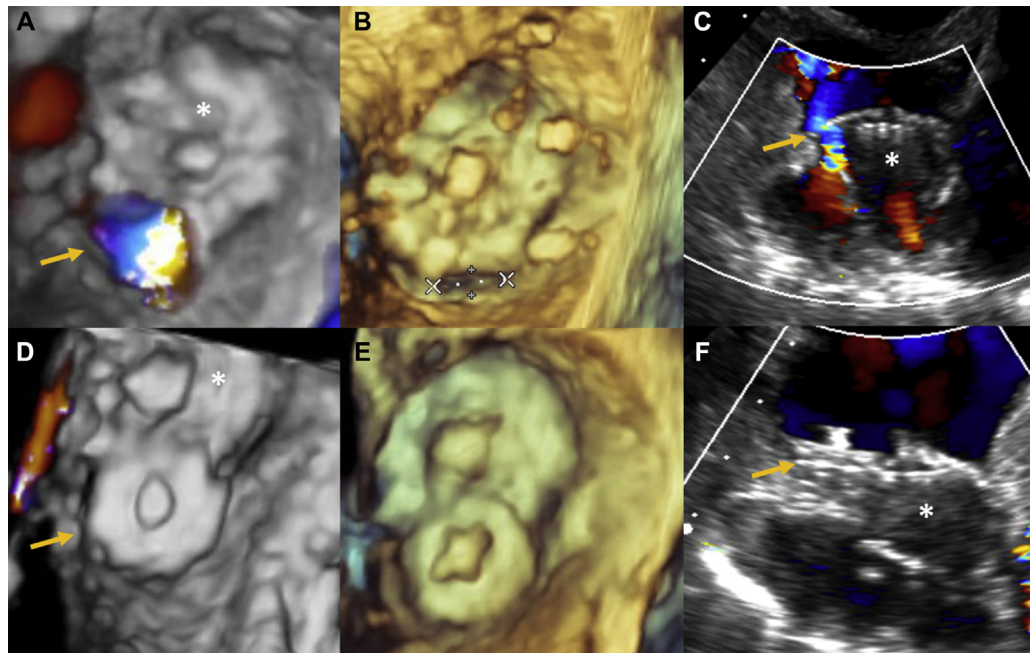
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Left atrial appendage occlusion (LAAO) is an effective stroke prevention method in atrial fibrillation patients who are not suitable for long-term anticoagulation. However, persistent leak is seen in up to 12% of patients following LAAO with the currently available devices (1). Continuation of anticoagulation and serial imaging are recommended in patients with residual leaks >5 mm (1). Alternatively, percutaneous closure of these leaks has been reported, but experience with this approach is limited (2).

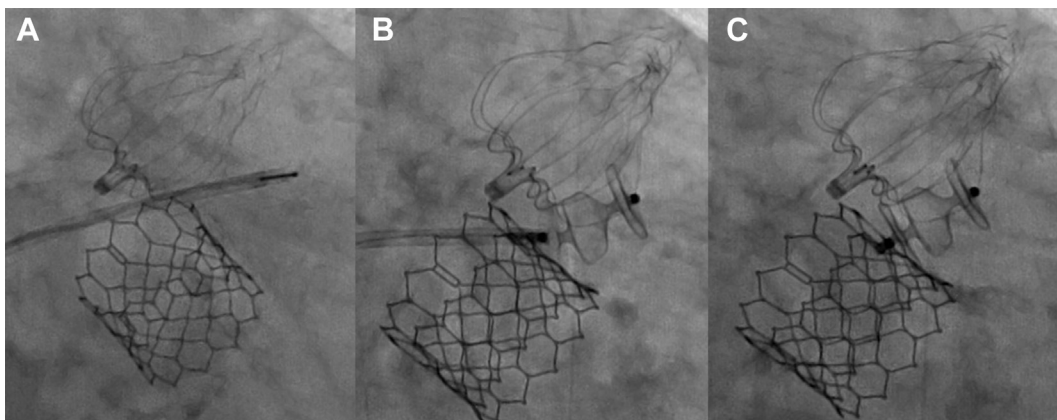
An 81-year-old woman with a history of transcatheter aortic valve replacement, atrial fibrillation (CHADS<sub>2</sub>VASC<sub>2</sub> score 6), hypertension, diabetes, and heart failure was referred for LAAO due to recurrent gastrointestinal bleeding on apixaban. She underwent an uneventful LAAO with a 33-mm Watchman device (Boston Scientific, Marlborough, Massachusetts). At the conclusion of the procedure, no peridevice leak was noted on transesophageal echocardiogram (TEE) (Online Video 1). On 45-day follow-up TEE, significant peridevice leak was noted (Online Video 2, Figures 1A to 1C); therefore, Warfarin was continued. Repeat TEE after 3 months showed

persistent (6 × 3 mm) peridevice leak (Online Video 3), and hence, percutaneous closure was planned. The residual atrial septal defect was crossed with an Agilis steerable sheath (St. Jude Medical, Saint Paul, Minnesota). The leak was crossed with a 0.035-inch Wholey wire (EV3, Plymouth, Minnesota) and a 5-F multipurpose catheter. The Wholey wire was then exchanged with a 0.035-inch Amplatz extra-stiff wire (Cook, Bloomington, Indiana). A 6-F multipurpose guiding catheter was then advanced over the extra-stiff wire, and was used to deliver a 10-mm Amplatzer Vascular Plug-II (St. Jude Medical) (Online Videos 4 and 5, Figures 1D to 1F and 2). There was no residual leak on follow-up TEE after 45 days (Online Video 6), and complete thrombosis of the LAA was confirmed on cardiac computed tomography imaging (Figure 3).

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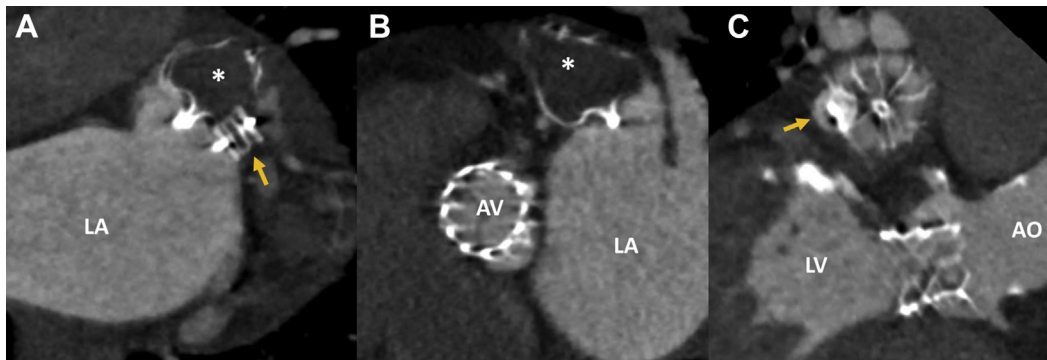
**FIGURE 1** TEE Illustrating the Peri-Watchman Leak Before and After Percutaneous Closure

(A to C) Peri-Watchman leak before closure (Online Videos 1, 2, and 3). (D to F) Peri-Watchman leak after closure (Online Videos 4, 5 and 6). (A and D) Three-dimensional color images. (B and E) Three-dimensional color images. (C and F) Two-dimensional color images at a 135° angle. **Yellow arrows** = peridevice leak and the Amplatzer Vascular Plug-II; **asterisks** = Watchman device. TEE = transesophageal echocardiography. The borders of the leak in **panel B** are demarcated with the x/+ signs.

**FIGURE 2** Cine Still Images of Percutaneous Closure of the Peri-Watchman Leak

(A) Accessing the leak with a Wholey wire. (B) Delivery and deployment of a 10-mm Amplatzer Vascular Plug-II. (C) Final results after plug release.

**FIGURE 3** Multiplanar Reconstruction of Cardiac Computed Tomography at 45 Days Following Leak Closure



The reconstruction demonstrates thrombosis of the left atrial appendage **Yellow arrow** = Amplatzer Vascular Plug-II, **asterisks** = Watchman device with complete thrombosis of the appendage. AO = aorta; AV = transcatheter aortic valve; LA = left atrium; LV = left ventricle.

## REFERENCES

1. Asmarats L, Rodes-Cabau J. Percutaneous left atrial appendage closure: current devices and clinical outcomes. *Circ Cardiovasc Interv* 2017;10:e005359.
2. Hornung M, Gafoor S, Id D, et al. Catheter-based closure of residual leaks after percutaneous occlusion of the left atrial appendage. *Catheter Cardiovasc Interv* 2016;87:1324-30.

**KEY WORDS** atrial fibrillation, left atrial appendage occlusion, peri-device leak, stroke

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