

Complex left atrial appendage closure in multimorbid patient using AVP II occluder: A case report

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A 69-year-old multimorbid man with paroxysmal atrial fibrillation (CHA₂DS₂-VASC score 4, HAS-BLED score 5) was referred for left atrial appendage (LAA) closure due to multiple contraindications to oral anticoagulation [1]. His complex medical history included hypertrophic cardiomyopathy, coronary artery disease necessitating recent percutaneous coronary intervention, peripheral arteriopathy, chronic kidney disease (Cr 24 ml/min/1.73 m²), and anemia. The patient's warfarin intolerance, severe kidney disease, high bleeding risk, and requirement for dual antiplatelet therapy post-percutaneous coronary intervention further precluded anticoagulation use.

Recent studies have shown promising long-term outcomes for LAA occlusion procedures [2]. While both percutaneous and surgical approaches are viable options for LAA closure [3], in this case the percutaneous approach was deemed most appropriate due to the patient's multiple comorbidities. This decision was further supported by the patient's unique anatomical features, which required careful device selection and procedural planning.

Pre-procedural computed tomography (CT) and transesophageal echocardiography (TEE) showed an unusual LAA anatomy with an oval-shaped orifice (7 × 16 mm) and a landing zone of 11–18 mm (Figure 1A–C). Virtual and augmented reality (VR/AR) planning based on CT data guided device selection. While various occluders were considered, including the Amplatzer Septal Occluder, the

Amplatzer Vascular Plug II (AVP II) was ultimately chosen for its optimal anatomical fit and softer composition, which mitigated risks of embolization and erosion (Supplementary material, Video S1). The AVP II, typically used for paravalvular leak closure, was sized following paravalvular leak closure protocols with 30%–50% oversizing.

To the best of our knowledge, this is the first reported case of LAA closure using an AVP II occluder in a patient with native LAA anatomy. While there have been a few reported cases of an AVP II (Abbott, Plymouth, MN, US) occluder being used for failed surgical suture of the LAA [4, 5], our case demonstrates the successful use of this device in a patient with no previous surgical intervention.

The procedure was performed under general anesthesia using a standard transseptal approach. A Fustar 12F steerable sheath (Lifetech Scientific, Shenzhen, China) and a Flexor 7F delivery catheter (Cook Medical, Bloomington, IN, US) (the “mother and child technique”) were used to deploy the AVP II occluder, with the distal disc and sealing mid-portion in the LAA and the proximal disc covering the LAA ostium. Procedural TEE and X-ray angiography showed a stable position. The patient was discharged on dual antiplatelet therapy, and remained asymptomatic at 3-month follow-up. Two-dimensional (2D) and three-dimensional (3D) TEE and CT confirmed stable device position with no residual leaks or device-related thrombi (Figure 1D–F). VR/AR evaluation showed complete LAA occlusion (Supplementary material, Video S2).

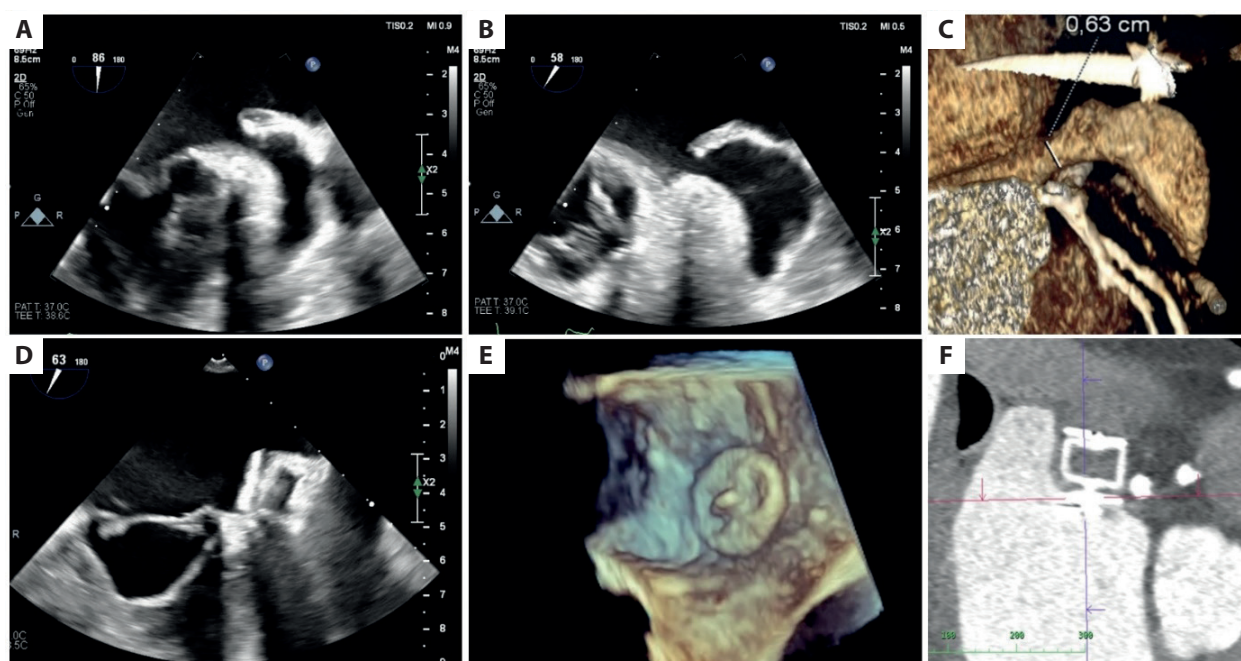


Figure 1. Pre- and post-procedural imaging. **A, B.** Transesophageal echocardiography (TEE) of left atrial appendage (LAA) before occlusion, showing atypical anatomy of LAA. **C.** Computed tomography (CT) three-dimensional reconstruction of LAA with thin neck. **D.** Two-dimensional TEE at 3-month follow-up showing AVP II occluder (Amplatzer Vascular Plug II, Abbott, Plymouth, MN, US) successfully closing LAA. **E.** Three-dimensional TEE at 3-month follow-up showing ostium of LAA completely covered by proximal occluder disc. **F.** CT at 3-month follow-up showing no contrast leak behind proximal occluder disc, confirming complete LAA occlusion

This case highlights the challenges posed by unusual LAA anatomy in patients undergoing closure procedures. The incorporation of VR/AR planning based on CT data allowed the choice of an appropriate occluder device and facilitated the successful off-label use of the AVP II occluder. The complexity of this case required a multidisciplinary approach with close collaboration between interventional cardiologists, imaging specialists and anesthetists. The favorable outcome achieved in this case suggests that the AVP II occluder may be a valuable option for complex LAA closure when standard devices are not suitable.

In conclusion, complex LAA closure in patients with unusual anatomy requires careful pre-procedural planning, innovative approaches, and a multidisciplinary team. VR/AR planning based on CT data and off-label use of the AVP II occluder proved effective in achieving complete LAA occlusion in this challenging case. The successful outcome highlights the importance of individualized patient care and the need for a diverse toolkit in complex structural interventions.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/polish_heart_journal.

Article information

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