

## Cardiac Imaging

# Left Atrial Appendage Closure. Initial Single-Center Experience with the Watchman Device

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**A**trial fibrillation (AF) is the most common cardiac arrhythmia. Its increasing incidence has serious socioeconomic consequences, because of its strong association with ischemic stroke. Patients with AF have an average 5% annual risk of ischemic stroke and a 5-fold higher risk compared to an age-matched population in sinus rhythm.

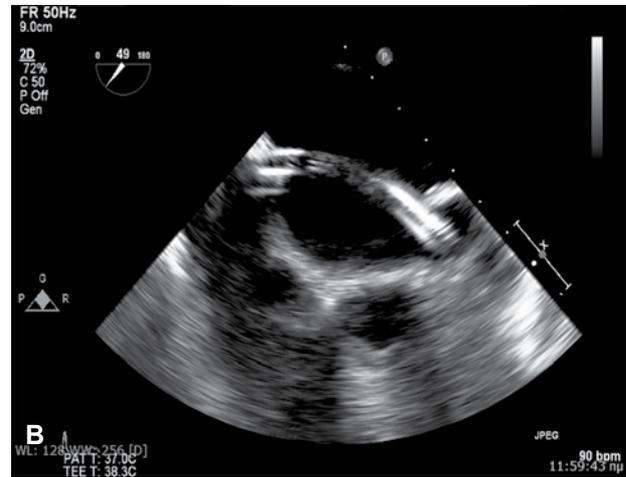
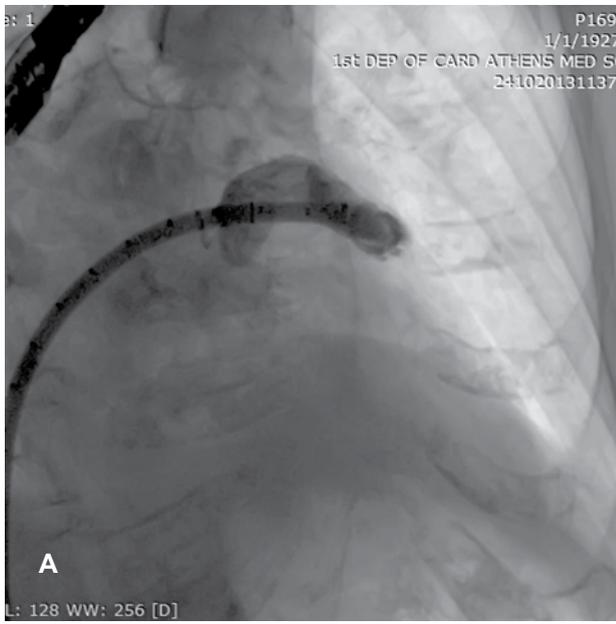
The most important aspect of the treatment of patients with AF is the prevention of stroke. According to echocardiographic data, the left atrial appendage (LAA) is considered to be the main site of emboli in patients with AF.<sup>2,3</sup> LAA closure is already an available alternative strategy to the long-term use of oral anticoagulants, when these are contraindicated.<sup>4</sup> The occlusion of the LAA has been included in the latest Guidelines of the European Society of Cardiology for the management of patients with atrial fibrillation (Class IIb, level of evidence B).<sup>5</sup>

In October 2013, in the Hippokration General Hospital of Athens, the first in Greece LAA closure procedure with a “Watchman” (Boston Scientific) device was conducted in an 82-year-old woman. The Watchman device consists of a self-expandable nitinol frame structure with fixation barbs and a permeable polyester cloth that covers the atrial surface of the device, which may be partially recaptured

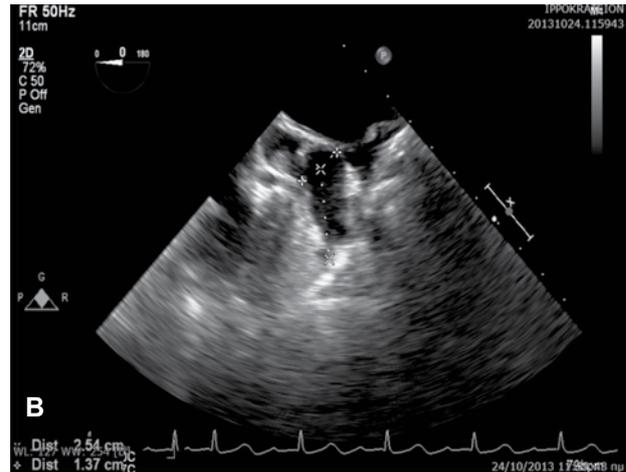
and redeployed if the implant location is deemed unsatisfactory.

The patient had a history of paroxysmal non-valvular AF and arterial hypertension under treatment with irbesartan. Anticoagulation with Dabigatran 110 mg × 2 caused significant skin bruising and an episode of gastrointestinal bleeding. Bleeding complications also occurred with acenocoumarol, with an international normalized ratio value of 2.3 causing extensive skin bruising and eye bleeding with partial loss of vision. No history of diabetes mellitus, smoking, dyslipidemia or previous stroke was reported. The estimated CHA<sub>2</sub>DS<sub>2</sub>-VASc score was 4, with an estimated annual risk of stroke 4% and the HAS-BLED score was calculated as equal to 4.

In view of the above history, LAA occlusion was decided upon as an alternative therapeutic option to long-term anticoagulation. Transthoracic and transesophageal ultrasound, performed 24 hours before the intervention, excluded the presence of thrombus within the appendage, atrial septum defect or aneurysm, symptomatic valvular disease, aortic arch atheroma, prosthetic valve and ejection fraction <35%. The procedure was performed under general anesthesia with fluoroscopic and transesophageal ultrasound (TEE) guidance. The atrial septum puncture system (HeartSpan - Transeptal Needle and



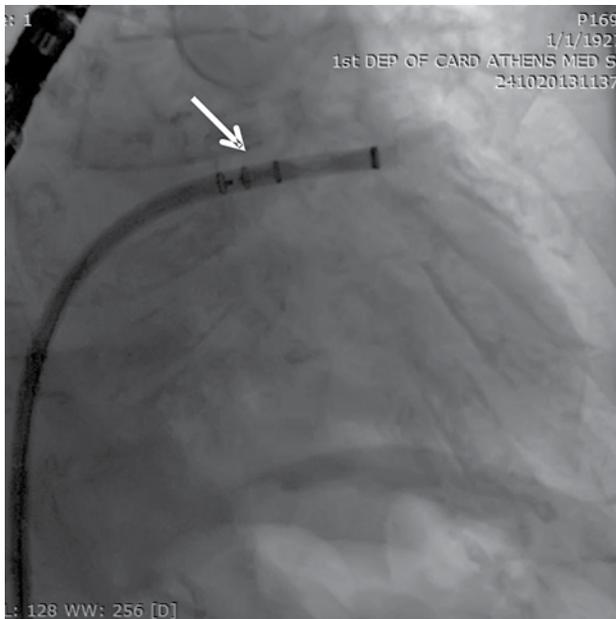
**Figure 1.** LAA angiography performed with a 5F pigtail catheter (Panel A). Ultrasound view of the 5F pigtail catheter in the LAA (white arrow) (Panel B)



**Figure 2.** Angiographic view for the measurement of the “neck” of the LAA (Panel A). Ultrasound view showing the measurement of the “neck” of the LAA (Panel B)

Styilet Kit) was introduced through the right femoral vein, assisted by an 11F-sheath. Intravenous heparin was administered with a target activated clotting time (ACT > 250 s). A 5 F pigtail catheter was advanced through the puncture sheath and LAA angiography was performed (view: RAO 28° cranial 20°) (Figure 1). Subsequently, appropriate measurements of the “neck” of the LAA were performed (Figure 2). Based on TEE, the diameter of the “neck” of the LAA was 18 mm. Accordingly, a 24 mm Watchman device was selected. The Watchman device was delivered through the dedicated 14 F access sheath, which also

served as a conduit for the delivery catheter (Watchman Access System, Boston Scientific) (Figure 3). The device was implanted successfully through the sheath to the predetermined position without residual communication between the LAA and left atrium. The complete occlusion of the LAA was confirmed by color-Doppler TEE (Figure 4,5). Moreover, the stability control test (TUG test) demonstrated that the device was stable. The final angiogram confirmed complete occlusion and good circumferential contact of the disk of the device with the orifice of the LAA. There was no pericardial effusion or other signifi-

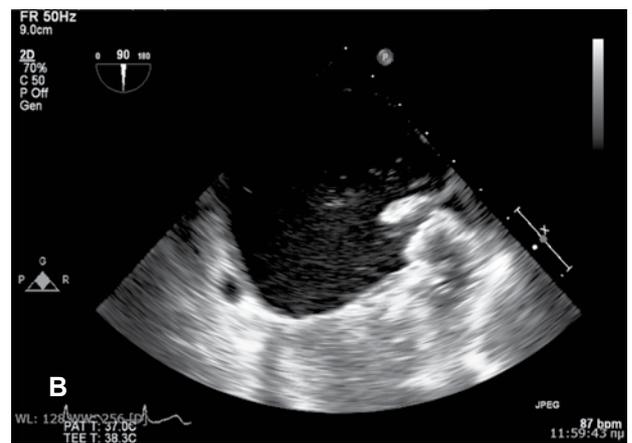


**Figure 3.** Launch of the Watchman device through the dedicated 14 F access-sheath. The arrow designates the desired position for the 24 mm Watchman in the orifice of the left atrial appendage.

cant complication. The total duration of the procedure was 90 minutes and 200 mL of contrast infusion were administered. After 24 h new fluoroscopic imaging confirmed the stability and the proper position of the device.

**References**

1. Sick PB, Schuler G, Hauptmann KE, et al. Initial worldwide experience with the WATCHMAN left atrial appendage system for stroke prevention in atrial fibrillation. *J Am Coll Cardiol* 2007; 49: 1490-1495.
2. Reddy VY, Holmes D, Doshi SK, Neuzil P, Kar S. Safety of percutaneous left atrial appendage closure: results from the Watchman Left Atrial Appendage System for Embolic Protection in Patients with AF (PROTECT AF) clinical trial and the Continued Access Registry. *Circulation* 2011; 123: 417-424.
3. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation as an independent risk factor for stroke: the Framingham Study. *Stroke* 1991; 22: 983-988.
4. Lerakis S, Synetos A, Toutouzas K, Stefanadis C. Transcatheter occlusion devices for the prevention of stroke in patients with atrial fibrillation. *Hellenic J Cardiol* 2008; 49: 33-36.
5. Camm AJ, Lip GY, De Caterina R, et al. 2012 focused update of the ESC Guidelines for the management of atrial fibrillation: an update of the 2010 ESC Guidelines for the management of atrial fibrillation. Developed with the special contribution of the European Heart Rhythm Association. *Eur Heart J* 2012; 33: 2719-2747.



**Figure 4.** A. Angiographic view with contrast injection of the released Watchman device (white arrow designates the left atrial appendage). B. Ultrasound view of the Watchman device deployed into the LAA during contrast infusion (white arrow designates the left atrial appendage and dashed white arrow the contrast).



**Figure 5.** The complete occlusion of the LAA was confirmed by color-Doppler TEE.