Transesophageal echocardiography guided transseptal puncture for atrial fibrillation ablation in a patient with a 30 mm atrial septal closure device

Robert Sabiniewicz[1], Tomasz Królak[2], Lidia Woźniak[1], Szymon Budrejko[2], Grzegorz Raczak[2]

[1]Department of Pediatric Cardiology and Congenital Heart Diseases, Medical University of Gdansk, Gdansk, Poland
[2]Department of Cardiology and Electrotherapy, Medical University of Gdansk, Gdansk, Poland

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Percutaneous device closure is a well-established treatment of atrial septal defects (ASD) and the method of stroke prevention in a selected group of patients with patent foramen ovale (PFO). However, in case of drug-refractory atrial fibrillation (AF), when catheter ablation of pulmonary veins (PV) is required, the access to the left atrium is more difficult due to the ASD/PFO closure device.

We report a case of a 58-year-old man with PFO closure performed due to recurrent stroke (Nit-Occlud PFO device 30 mm in diameter). 3.8 years after the successful procedure the patient suffered from frequent, symptomatic episodes of drug-refractory AF. Before the pulmonary vein isolation (PVI) procedure a computed tomography scan was obtained to access the PV anatomy and to visualize the device position (Figure 1 A).

During PVI four venous accesses were obtained: two in the right and two in the left femoral veins. Diagnostic catheters were placed in coronary sinus and His bundle position. Left atrial access was obtained with a double transseptal puncture under both fluoroscopic and transesophageal echocardiography (TEE) guidance (Vivid q). Two 8.5-Fr transseptal sheaths were advanced over a guide wire to the superior vena cava. Then a transseptal needle was introduced into the sheath, and the whole unit was withdrawn under the fluoroscopic antero-posterior view and TEE guidance. The typical "jump" of the needle could not be observed due to device presence. The optimal site of the transseptal puncture was determined mostly on TEE guidance. In the bicaval view the correct position in the vertical axis was fixed. In the short axis view the position of the puncture needle was corrected in the anterior-posterior (A-P) axis (Figure 1 B). The transseptal system was positioned in relation to the interatrial septum, visualized by TEE and directed to the thinner part of the septum, below and posterior to the occluder device. When the transseptal unit was placed in the desired location, the position was confirmed by the typical tenting of the septum caused by the transseptal unit, and the needle was advanced through the septum. Effectiveness of the puncture was confirmed by saline injection to the left atrium and assessed by TEE (Figure 1 C). Finally, the transseptal sheath was advanced over the wire to the left atrium. A second transseptal puncture was performed using a similar technique, slightly inferior to the first access.

The ablation strategy consisted of PVI with two wide antral circumferential RF ablations around ipsilateral PV using an electroanatomical mapping system (CARTO 3), a 3.5-mm irrigated-tip catheter and a circular mapping catheter. All four PV were isolated with confirmed entrance and exit block (Figure 1 A). There were no procedure-related complications.

More and more patients after device PFO/ASD closure will undergo procedures requiring transseptal access. As described in this case and several previous reports [1–4], transseptal access in a patient with an atrial septal occluder device can be performed successfully and allow pulmonary vein isolation. The TEE is an effective method to guide transseptal puncture in this group of patients.

Conflict of interest

The authors declare no conflict of interest.

Corresponding author:
Lidia Woźniak MD, Department of Pediatric Cardiology and Congenital Heart Diseases, Medical University of Gdansk, 7 Debinki St, 80-211 Gdansk, Poland, phone: +48 502 544 330, e-mail: lidiawozniak@yahoo.com
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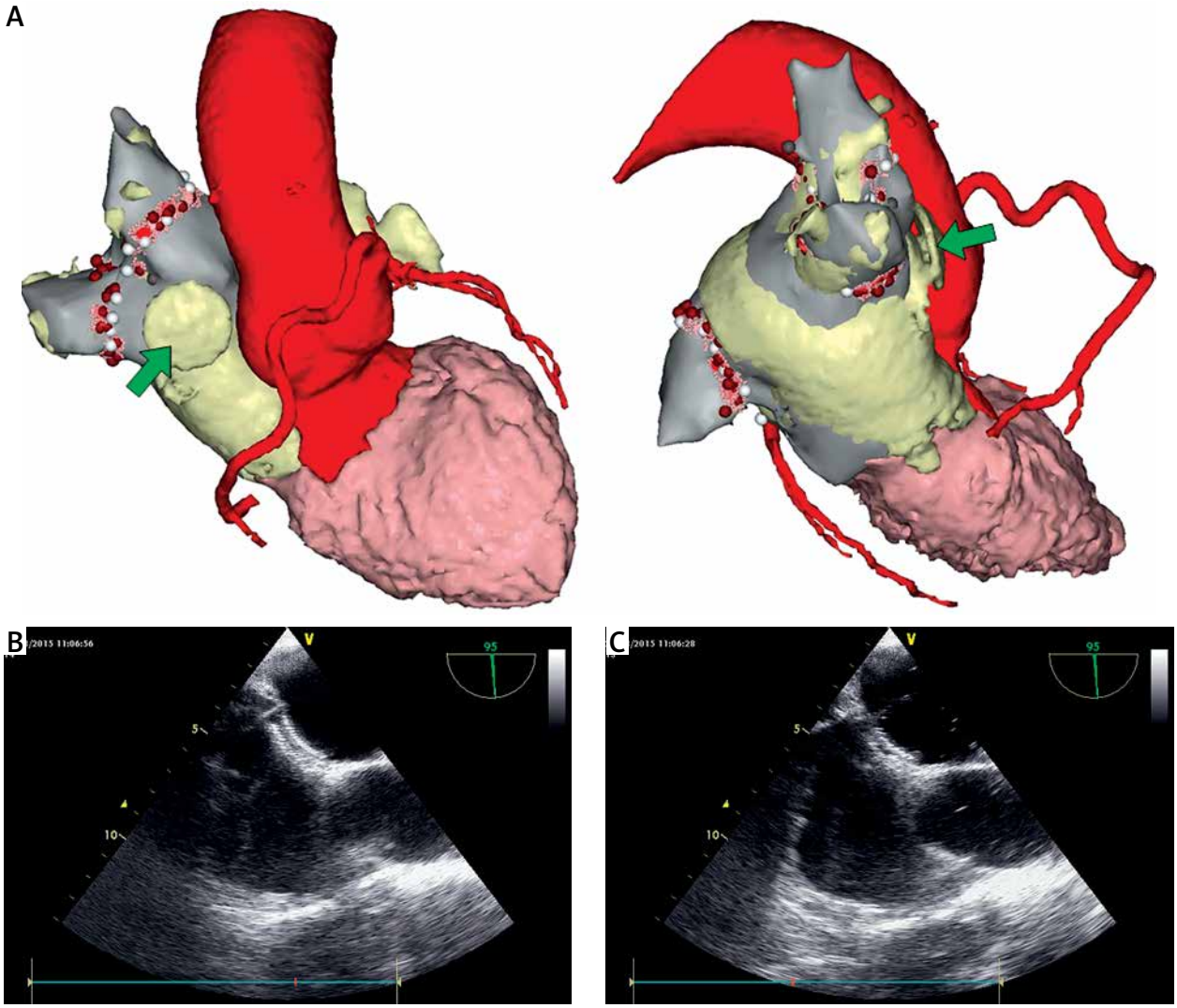

Figure 1. A – Computed tomography scan merged with CARTO map of left atrium (LA) indicating relation of the device (green arrows) to the anatomical structures and ablation line (red dots). Projections shown in Figure 1: right anterior oblique (RAO) 46° caudal 25°, RAO 147° caudal 12°. **B** – TEE short axis view. Tenting of the septum caused by the transseptal unit in posterior part of the interatrial septum closed to the device. **C** – TEE short axis view. Transseptal needle in LA. The control contrast echo shows microbubbles in LA

References

1. Li X, Wissner E, Kamioka M, et al. Safety and feasibility of transseptal puncture for atrial fibrillation ablation in patients with atrial septal defect closure devices. Heart Rhythm 2014; 11: 330-5.
2. Lakkireddy D, Rangisetty U, Prasad S, et al. Intracardiac echo-guided radiofrequency catheter ablation of atrial fibrillation in patients with atrial septal defect or patent foramen ovale repair: a feasibility, safety, and efficacy study. J Cardiovasc Electrophysiol 2008; 19: 1137-42.
3. Chen K, Sang C, Dong J, et al. Transseptal puncture through Amplatzer septal occluder device for catheter ablation of atrial fibrillation: use of balloon dilatation technique. J Cardiovasc Electrophysiol 2012; 23:1139-41.
4. Knecht S, Sticherling C, Kühne M. Entering through the back-door: remotely navigated ablation of left atrial tachycardia in the presence of a large atrial septal defect occluder. Europace 2013; 15: 943.