

Left atrial appendage closure using Amulet device in a patient with prior percutaneous atrial septal defect closure

Daha önce perkütan yolla atriyal septal defekti kapatılan hastada sol atriyal apendiksin Amulet cihazı ile kapatılması

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Summary– Percutaneous left atrial appendage (LAA) occlusion is an alternative therapeutic option for stroke prevention in patients with atrial fibrillation and contraindications for oral anticoagulation. There are few data available regarding the technical success of percutaneous LAA closure in patients with the previous implantation of an atrial septal defect (ASD) or a patent foramen ovale closure device. This is the description of a case of a successful LAA closure performed with an Amplatzer Amulet occluder device (St. Jude Medical, Inc., St. Paul, MN, USA) in a patient with a previous history of percutaneous ASD.

Cerebral embolism, the most common complication of non-valvular atrial fibrillation (NVAF), typically occurs due to a thrombus formation in the left atrium (LA), predominantly in the left atrial appendage (LAA). Systemic anticoagulation is the standard of care for the prevention of cerebral and peripheral thromboembolism among NVAF patients with a high risk score. However, some patients with a high risk score are not suitable for anticoagulant therapy, particularly when there is the risk of bleeding. LAA occlusion is an effective therapeutic option (either percutaneous or surgical) for such patients.^[1,2] The transseptal puncture performed during a percutaneous closure of LAA is one of the most important and rate-limiting steps of the procedure. Previously, it has been proposed that percutaneous LAA closure was contraindicated in patients with a history of atrial septal defect (ASD), patent foramen ovale (PFO) clo-

Özet– Perkütan sol atriyal apendiks (SAA) kapatılması atriyal fibrilasyonu (AF) ve oral antikoagülasyona kontra-endikasyonu bulunan hastalarda inmenin önlenmesinde alternatif bir tedavi şeklidir. Ancak daha önce perkütan atriyal septal defekt (ASD) ya da patent foramen ovale (PFO) kapama cihazı konulan hastalarda perkütan SAA kapatılmasının teknik açıdan başarısı ile ilgili çok az bilgi vardır. Bu nedenle, bu olguda daha önce perkütan ASD kapama işlemi yapılan hastada Amplatzer™ Amulet™ kapama cihazı (St. Jude Medical) kullanılarak perkütan yolla başarılı SAA kapama işlemi sunulmuştur.

sure device, or surgical interatrial septal defect closure.^[3] There are few case reports in the literature regarding percutaneous LAA closure in patients with a previous ASD or PFO closure device.^[4,5] Therefore, herein, the case of a successful percutaneous LAA closure performed in a patient with a history of an ASD closure device is described.

Abbreviations:

AF	Atrial fibrillation
ASD	Atrial septal defect
LA	Left atrium
LAA	Left atrial appendage
NVAF	Non-valvular atrial fibrillation
PFO	Patent foramen ovale
TEE	Transesophageal echocardiography

CASE REPORT

A 79-year-old woman was referred to the clinic for a percutaneous LAA closure due to a history of recurrent lower gastrointestinal bleeding and blood transfusions under 2 different oral anticoagulants. She

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also had the complaints of exertional dyspnea and fatigue ongoing for 3 months. The physical examination was unremarkable, noting only conjunctival and palmar pallor. A review of the patient medical history revealed hypertension, paroxysmal atrial fibrillation (AF) (CHA₂DS₂VASc and HAS-BLED scores were both 4 points) and percutaneous ASD closure 2 years earlier using an Amplatzer septal occluder 18 mm in diameter (St. Jude Medical, Inc.; St. Paul, MN, USA). Electrocardiography indicated a normal sinus rhythm. Echocardiography revealed that left ventricular systolic functions were normal with minimal mitral insufficiency as well as the presence of an ASD closure device in the interatrial septum. Transesophageal echocardiography (TEE) demonstrated a well-seated ASD closure device with a device-free interatrial septal area, particularly in the inferoposterior septum. The medications used by the patient were apixaban 5 mg twice daily, oral iron capsules, metoprolol succinate 50 mg o.d and ramipril 5 mg o.d. Warfarin had been replaced with apixaban 6 months earlier due to labile international normalized ratio values and the history of gastrointestinal bleeding. The blood biochemistry parameters, including renal functions, were within the normal reference limits; however, a complete blood

count demonstrated a hemoglobin value of 6.4 g/dL, which was compatible with iron deficiency. She had undergone upper and lower endoscopic evaluation 3 months prior, which revealed minor bleeding in the descending colon and atrophic gastritis. Thus, we decided to perform a percutaneous LAA closure.

The LAA closure procedure was initiated after deep sedation. Using the right femoral vein access, a transseptal puncture was performed with a BRK transseptal needle (St. Jude Medical, Inc., St. Paul, MN, USA) and an 8.5-F transseptal introducer sheath (Fast-Cath Transseptal Guiding Introducer; St. Jude Medical, Inc., St. Paul, MN, USA) under fluoroscopy and transesophageal echocardiography guidance (Figs. 1a-d). The most critical step for LAA closure in this patient was positioning the transseptal puncture site in the inferoposterior region of the interatrial septum without touching the disc of the ASD closure device. After achieving left atrial access, a stiff wire and a 12-F Amplatzer Torqvue 45x45 delivery system (St. Jude Medical, Inc., St. Paul, MN, USA) was advanced into the LA. A 25-mm Amplatzer Amulet LAA occluder device (St. Jude Medical, Inc., St. Paul, MN, USA) was deployed successfully under fluoroscopy

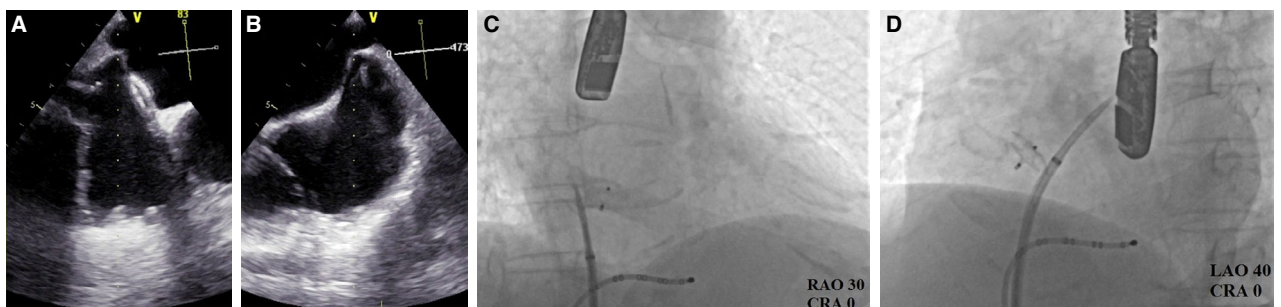


Figure 1. Tenting on the (A) posterior and (B) inferior regions of the interatrial septum as seen with transesophageal echocardiography. (C) Right and (D) left anterior oblique fluoroscopic views of the area between the atrial septal occluder device and the transseptal puncture site.

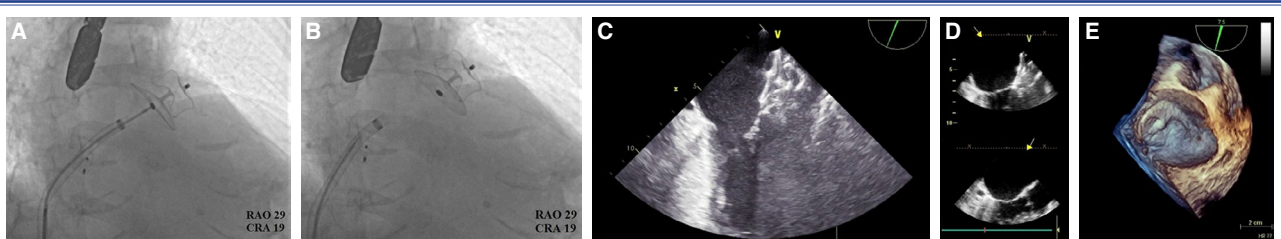


Figure 2. (A) Fluoroscopic images of the left atrial appendage (LAA) occluder device in use, and (B) after closure. (C) Two-dimensional (2D) and (D) 3D transesophageal echocardiography images illustrating the position of the Amplatzer Amulet LAA occluder device (St. Jude Medical, Inc., St. Paul, MN, USA) after closure.

and TEE guidance without any leakage or instability after appropriate maneuvers (Tug test) (Figs. 2a-e).

DISCUSSION

Thromboembolism is known to be one of the most important clinical events in patients with NVAf. Vitamin K antagonists and new oral anticoagulant drugs are very effective at reducing the thromboembolism risk; however, these agents can create minor and/or major bleeding risks for those patients.^[6-9] LAA closure is an emerging interventional therapeutic option, especially in patients with a high risk for bleeding or embolic events under oral anticoagulation.^[10,11] However, the presence of an occluder device in the interatrial septum is a major limitation for LAA occlusion using percutaneous methods and transseptal access. Despite this difficulty, previous reports have revealed favorable outcomes after interatrial septal closure, especially in the presence of appropriate interatrial septal tissue. Gafoor et al.^[5] reported successful LAA occlusion in patients with prior septal closure devices. Similarly, in a recent case report, Heersink et al.^[4] reported successful LAA occlusion after percutaneous ASD closure using a Watchman device (Boston Scientific, Corp., Marlborough, MA, USA). Furthermore, Gloekler et al.^[12] also performed a transseptal puncture, perforated and pre-dilated the lower disc of the ASD closure device, and successfully finished the LAA closure procedure as well as deployment of an additional small ASD closure device at the site of puncture. Our case appears to be the first with the successful deployment of the Amulet device in a patient with a history of previous percutaneous ASD closure. The location of the transseptal puncture during percutaneous LAA closure is the critical step that provides a technical advantage. In addition to the LAA morphology, device characteristics may also affect procedural success due to the limited interatrial septal area available for transseptal puncture, as it may limit maneuverability of the operator during the procedure. We recommend both fluoroscopic and TEE-guidance during the procedure, not only for optimal device deployment, but also to achieve an optimal transseptal puncture.

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Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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Keywords: Atrial septal defect occluder; left atrial appendage closure; transseptal puncture.

Anahtar sözcükler: Atriyal septal defekt oklüder; sol atriyal apendiks kapatılması; transseptal ponksiyon.