Transcatheter closure of a giant left atrial appendage aneurysm

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DOI: 10.33963/KP.a2023.0028

Received:
December 7, 2022

Accepted:
January 22, 2023

Early publication date:
January 27, 2023

A 67-year-old female patient diagnosed with a left atrial appendage (LAA) aneurysm and persistent atrial fibrillation was referred for further diagnosis and treatment. The patient had a several-year paroxysmal atrial fibrillation history associated with troublesome symptoms (European Heart Rhythm Association [EHRA] class 2b). For this reason, she underwent successful electrical cardioversions in May 2021 and March 2022. One day after the second cardioversion, an ischemic stroke occurred despite using non-vitamin K antagonist oral anticoagulants (NOACs). Treatment at that time included mechanical thrombectomy, which prevented permanent neurological deficits. As part of further stroke prevention, given the ineffectiveness of NOACs, it was decided to include warfarin. During further follow-up, the patient developed recurrent arrhythmia. For this reason, the patient was qualified for cryoablation of the pulmonary veins.

Transesophageal echocardiography (TEE) before cryoablation showed an LAA aneurysm with a longitudinal dimension of 63 × 40 × 39 mm with a distal thrombus and sludge, with a preserved LAA neck structure (width 23 × 31 mm, length 13 mm). The dimensions of the LAA aneurysm assessed by a computed tomography (CT) scan were 4.59 × 4.66 × 4.9 cm. Contrast defects indicating the presence of a thrombus in the lumen of the aneurysm were seen.

The Heart Team qualified the patient for endovascular elimination of the LAA aneurysm, with cryoablation performed in the second stage. The LAA closure procedure was performed using a 34 mm Amplatzer Amulet occluder and Sentinel Cerebral Protection System. Despite the use of the neuroprotection system, the implantation technique was modified by forgoing the LAA angiography and relying on the so-called touchless technique. It involves avoiding the insertion of catheters deep into the lumen of the LAA lobe, which, in this case, was facilitated by the size of the aneurysm and the presence of the thrombus at the top of the LAA lobe. These modifications to the implantation technique reduced the risk of the thrombus migrating beyond the LAA.

After occluder expansion in the neck of the LAA, no flow was recorded in the LAA. The device's disk completely covered the entrance to the LAA, preventing not only the flow of blood into the LAA but also guarding the occluder against possible displacement into the lumen of the aneurysm after its release. After implantation of the occluder, the neuroprotection system was withdrawn, and its filters were taken out and flushed with saline. In the washing, only two approximately 2-millimeter structures were found, which may have corresponded to small fragments of thrombus. The procedure itself and the post-operative period went without complications. The patient was discharged the next day with a recommendation to take acetylsalicylic acid and clopidogrel until a follow-up visit 6 weeks after the procedure.

The TEE examination performed at the follow-up visit showed no dislocation of the occluder or the presence of a thrombus or leakage on its surface. CT scans also verified the results of the TEE study. According to the earlier qualification, successful cryoablation of all pulmonary veins was performed.

Left atrial appendage aneurysm is one of infrequent anomalies. Only single cases have been described in the literature, based

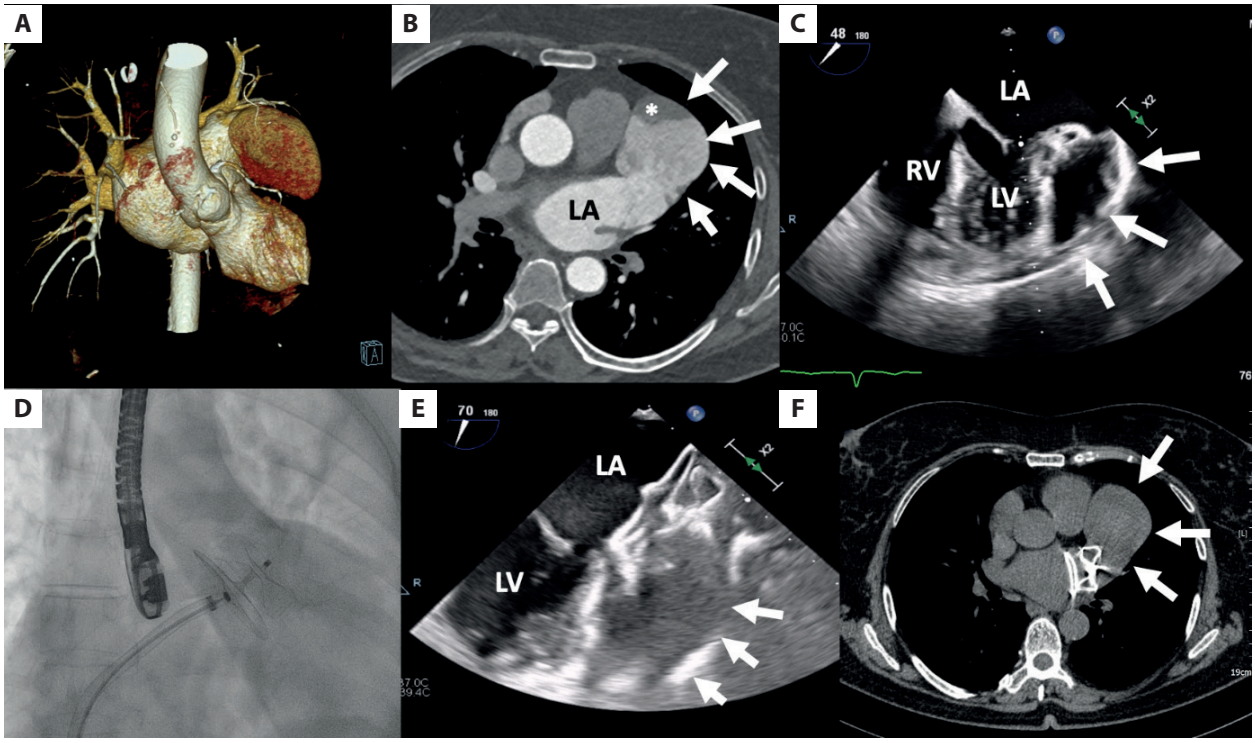

Figure 1. A. Visualization of an LAA aneurysm on CT scan. **B.** Visible thrombus in the LAA aneurysm on contrast-enhanced CT (asterisk). **C.** Four-chamber view showing the LAA aneurysm on TEE. **D.** Fluoroscopy image showing the occluder before release. **E.** TEE view of the LAA aneurysm after closure with an Amplatzer Amulet occluder. **F.** Image of the LAA aneurysm closed with the occluder on CT scan after 6 weeks (study without contrast). Arrows on all panels indicate the LAA aneurysm

Abbreviations: LA, left atrium; LAA, left atrial appendage; CT, computed tomography; LV, left ventricle; RV, right ventricle; TEE, transesophageal echocardiography

on which both congenital and acquired etiology of this condition can be inferred. LAA aneurysms are related to factors such as trauma to the LAA wall, an inflammatory process in the left atrial wall, abnormal vascularization, tuberculosis, or valvular defects [1].

In most cases, the clinical symptoms associated with LAA aneurysms appear after the age of 30 as the lumen enlarges. In 34% of the cases described, the diagnosis occurred incidentally in asymptomatic individuals [2]. The most common symptoms associated with LAA aneurysms are supraventricular arrhythmias, strokes, shortness of breath, chest pain, and cough [3]. Cases of cardiac tamponade have also been described [4]. Because of the complications associated with LAA aneurysms, most notably the risk to the central nervous system and peripheral embolization, LAA aneurysms are often removed by cardiac surgery [5]. To our knowledge, this case report is the first case of transcatheter closure of an LAA aneurysm.

Article information

Conflict of interest: ZK and WS are proctors of Abbott company.

Funding: None.

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