Late Dehiscence of Left Atrial Appendage Closure Device

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A 68-year-old male with history of hypertension, diabetes mellitus, and persistent atrial fibrillation (AF) refractory to amiodarone (CHA2DS2-VASc score of 3) underwent a successful total thoracoscopic surgical ablation of AF (mini-maze) procedure in August 2011. A transesophageal echocardiogram (TEE) performed before the procedure revealed no evidence of thrombus in the left atrial appendage (LAA). The base of the LAA measured 45 mm. The mini-maze procedure involved bilateral thoracoscopic, minimally invasive bilateral pulmonary vein antral isolation with bipolar radiofrequency, creation of roof and floor lines to isolate the posterior left atrium using bipolar radiofrequency, and exclusion of LAA with AtriCure Gillinov-Cosgrove clip of 45 mm size. Intraoperative TEE after clip deployment showed near-complete occlusion of the LAA. Dabigatran was discontinued after 3 months. A year later, patient was referred for electrophysiology study for symptomatic left-sided atrial tachycardia. A cardiac magnetic resonance imaging performed before the ablation revealed persistent occlusion of the LAA with the AtriClip with only a small portion of the proximal LAA remaining patent without any flow. All 4 pulmonary veins remained isolated from the previous ablation. An area between the anterior ridge and the LAA clip was ablated using radiofrequency energy. Four and half years after the AtriClip implant, patient developed recurrent symptomatic atrial tachycardia for which he underwent a preprocedural coronary computed tomographic angiography that revealed an increase in size of the patent portion of the LAA with apparent change in the orientation of the clip. Figures 1A, 1B, 2A, and 2B compare the preablation magnetic resonance imaging images with the computed tomographic angiography images showing dehiscence of the AtriClip. This was confirmed on TEE, which also revealed a widely patent LAA with normal emptying velocity (Movie I in the Data Supplement; Figure 3). There was no evidence of LAA clot or thrombus. Anticoagulation was restarted given these findings.

LAA occlusion is recommended for stroke prevention in patients with AF undergoing concomitant cardiac surgery or in those who have contraindications to anticoagulation. Suture ligation or stapler excision of LAA has historically been used for patients with AF undergoing concurrent cardiac surgery for stroke prevention. However, in the first randomized LAA occlusion study involving 72 patients, a TEE performed 8 weeks postoperatively showed complete occlusion of LAA in only 72% of patients with staples and in 42% of patients with suture ligation. These suboptimal results led to the development of an epicardially placed AtriClip (AtriCure, Westchester, OH) at the base of the appendage for exclusion of blood flow into the LAA. The US Food and Drug Administration approved AtriClip in 2010 based on the results of a multicenter, nonrandomized EXCLUDE trial (Exclusion of Left Atrial Appendage with AtriClip Exclusion Device in Patients Undergoing Concomitant Cardiac Surgery) conducted in the United States. In this study, 70 patients with a history of AF or a CHADS2 score of ≥2 undergoing elective coronary artery bypass grafting, valve surgery, or maze procedures had this device placed for LAA exclusion. The trial demonstrated an excellent safety profile and at a short-term follow-up of 3 months, 60 of 61 patients (98.4%) had successful LAA exclusion by computed tomographic angiography or TEE imaging.

To date, the only trial reporting the long-term durability of this device was a 40 patient European study in which AtriClip was implanted during cardiac surgery. Of 32 patients available for long-term follow-up (8 had nondevice-related deaths), none of them had dislocation of the clip, intracardiac thrombus, or LAA reperfusion on CT imaging over a mean duration of 3.5 years.

In the case above, complete dehiscence of the AtriClip was noted 4.5 years after the implant. A device mismatch at the time of surgical implantation could have led to migration of the clip. Device embolization with endocardial LAA occlusion devices because of mismatch in size has also been reported. Anticoagulation should be continued, especially in patients with higher stroke risk after the LAA exclusion because dehiscence of the occluder raises a great concern for thromboembolic phenomenon. This case highlights the need for long-term durability data in a larger cohort with LAA occlusion devices. The results of the ongoing largest, multicenter, randomized LAA occlusion study (LAAOS III) with a
planned mean follow-up of 4 years will provide a better understanding of the safety and efficacy of the surgical LAA occlusion in patients with AF.6

Disclosures
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References

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