

Presence Of A Left Atrial Appendage Thrombus After Successful Surgical Closure Of The Left Atrial Appendage: A Case Report

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Abstract

A 64-year-old African American woman presented for defibrillator threshold testing (DFTs) after a recent hospitalization for ventricular fibrillation terminated by her ICD. She had a known history of non-ischemic cardiomyopathy, atrial fibrillation, rheumatic mitral valve disease s/p mitral valve replacement and a redo after subsequent endocarditis. In preparation for the DFTs, the patient underwent a transesophageal echocardiogram (TEE) to rule out left atrial (LA) or LA appendage thrombus. Patient was found to have a surgically closed appendage. Within the body of the closed appendage, a mobile thrombus was seen with clot free areas surrounding the thrombus. Doppler and contrast studies confirmed that there was no communication between the LA and the appendage. The patient underwent DFTs without complication and a follow-up TEE confirmed the presence of the clot in the non-communicating LA appendage.

Presentation

The patient is a 64 year-old woman who had progressively worsening cardiac symptoms. Two years prior, she had developed progressive dyspnea and lower extremity edema and sought medical evaluation for her issues. An echocardiogram revealed a depressed ejection fraction and moderate to severe mitral regurgitation with valve thickening. She was diagnosed with rheumatic mitral valve disease and started on medical therapy for her cardiomyopathy and anticoagulation for her valvular atrial fibrillation. She subsequently had an ICD implanted. The following year, she received a mitral valve replacement (MVR) for her severe mitral regurgitation secondary to rheumatic valve disease. Unfortunately, she developed a paravalvular leak and associated hemolytic anemia and was diagnosed with endocarditis. She underwent a repeat MVR and has done well since the surgery.

She was frequently hospitalized for heart failure exacerbations. However, within the past three months, she had been admitted

after an episodes of ventricular fibrillation (VF) terminated by her ICD. After her second episode, she was started on amiodarone. Subsequently, she was scheduled to undergo DFT to ensure an adequate safety margin for the termination of VF. Given the history of AF, a TEE was done to evaluate the LA and LA appendage for thrombus.

Patient Evaluation and TEE Findings

The patient was doing well without any active cardiac complaints. She remained on her outpatient medications: metoprolol succinate, amiodarone, simvastatin, lisinopril and aspirin. Her anticoagulation was held because of her hemolytic anemia. Her vitals were stable with a heart rate of 99 bpm and blood pressure of 100/62 mmHg. Her jugular venous pressure was 5 cm and she had clear breath sounds. She had a 2/6 holosystolic murmur at the left sternal border with radiation to the axilla. She had no lower extremity edema. The rest of her exam was unremarkable. Her labs revealed potassium of 4.4 mmol/L, creatinine of 1.04 mg/dL, magnesium of 1.8 mg/dL, platelets of 463,000/uL, and an INR of 1.05.

Her TEE revealed that the LA appendage was surgically sewn closed (Figure 1). Intravenous Optison injection revealed no crossover from the LA to the LA appendage (Figure 2). Doppler studies of the LA appendage did not reveal any evidence of crossover (Figure 3). This suggested that there is no communication between the LA appendage and the LA. There was a medium-sized, sessile, echogenic, mobile thrombus in the appendage (Figure 4). The thrombus did not occupy the whole body of the appendage and there were some areas that were not echogenic, suggesting that there were clot free areas within the LA appendage. Upon further investigation, the TEE was estimated to be done at least six months after the procedure.

Key Words:

Anticoagulation, Echocardiography, Electrophysiology, Heart Failure, Thrombus, Mitral Valve, Appendage, Defibrillation, Atrial Fibrillation.

Disclosures:

None.

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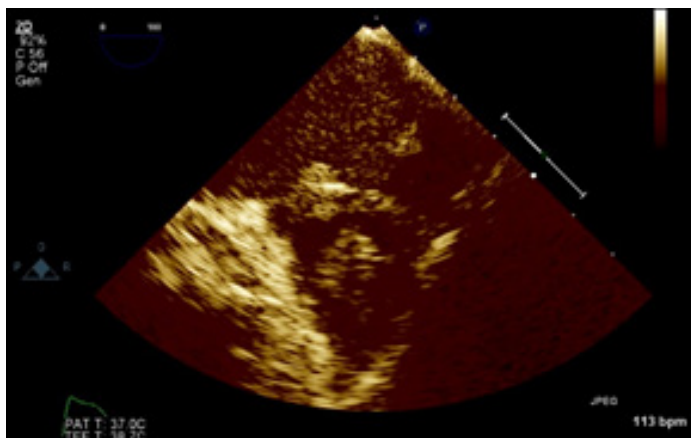


Figure 1: The white arrows demonstrate the suture lines of the LA appendage.

Follow-Up

The patient underwent an uneventful DFT procedure. She had been safely restarted on warfarin prior to her DFT. A subsequent TEE done two months after the DFT showed no change in these findings. While the patient failed to recall that she had a LA appendage closure procedure done, the TEE findings were confirmed with the patient. Given her chronic AF, the surgeon operating on her mitral valve had surgically closed the appendage.

Discussion

AF is commonly treated with anticoagulation to reduce the risk of stroke. However, stroke remains a major cause of serious disability and death in AF.¹ The major source of emboli in patients with AF or rheumatic mitral valve disease remains the LA appendage.²

Management of AF can involve pharmacologic rate control and anticoagulation, antiarrhythmic medications and consideration for electrical or pharmacological cardioversion. Invasive measures such as pulmonary vein ablation, AV nodal ablation with permanent pacemaker placement, or LA appendage closure are usually considered after exhausting conservative measures. Current guidelines suggest obliteration of the LAA during mitral valve surgery for patients with chronic AF.⁵ Surgical closure can be achieved via ligation, staples or suture. A randomized trial confirmed that LAA occlusion could be successfully performed at the time of routine CABG, without significantly increasing operative time, bleeding, or heart failure.⁶

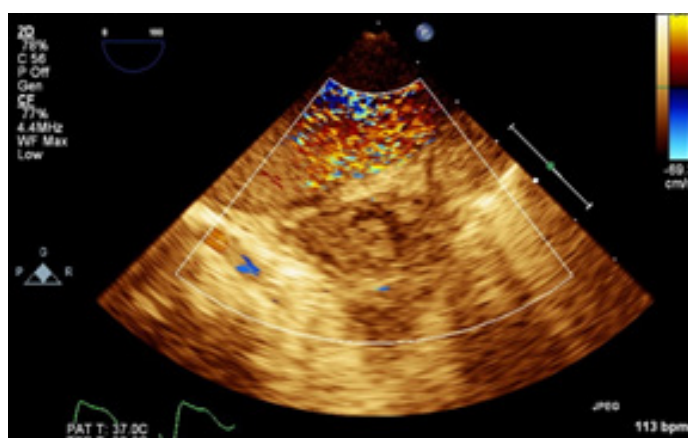


Figure 3: Doppler evaluation confirmed lack of flow into or out of the LA appendage.

However, no studies have shown a reduction in stroke in patients undergoing LAA closure at time of CABG.

A study using TEEs to follow-up on the success of the surgical closure revealed that the rate of functional appendage closure varies with the technique.⁸ The study found that only 40% of patients had successful LAA closure, while it also observed that successful LAA closure occurred more often with excision of the LAA (73%) versus suture exclusion (23%) and stapler exclusion (0%). As expected, no patients with LAA excision and a residual stump had LAA thrombus findings but 28 of 68 patients who had unsuccessful LAA exclusion had LAA thrombus detected by TEE. Of patients who had stapler exclusion, LAA thrombus was found in 1 of 2 patients with patent LAA, 2 of 2 patients with remnant LAA and persistent flow into the appendage, and 2 of 3 patients with excluded LAA and persistent flow into the appendage. Among patients who had suture exclusion, LAA thrombus was present in 2 of 6 patients with patent LAA, 1 of 2 patients with remnant LAA and persistent flow into the appendage, and 20 of 44 patients with excluded LAA and persistent flow into the appendage (46%).

A communication to the LA appendage can result in appendage clots. This can be concerning because the blood in the partially closed LAA is more stagnant is more likely to thrombose. However, there is scant data on whether appendages with residual flow or a residual stump are associated with increased risk of emboli. Nevertheless, it

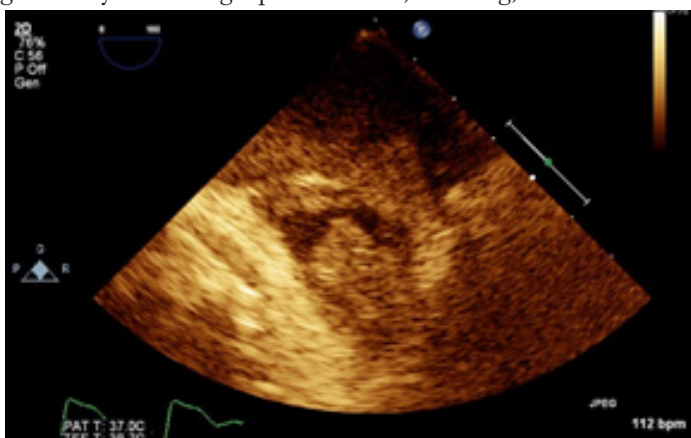


Figure 2: The arrow demonstrates contrast-free area inside the appendage as contrast fills the LA itself. There is no crossover of contrast into the LA appendage.

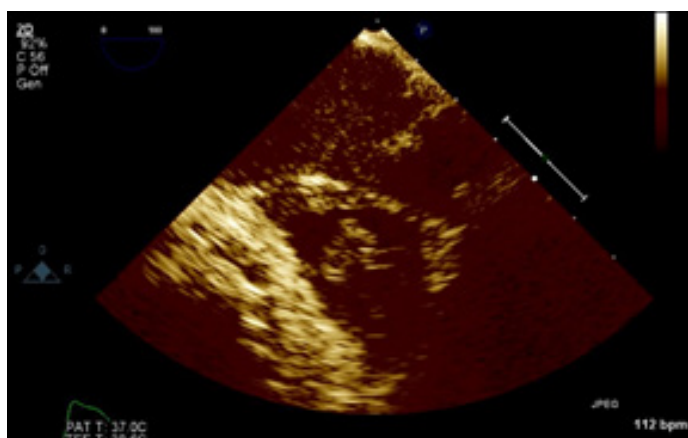


Figure 4: The black arrow demonstrates the 1.5 x 1.8 cm mobile thrombus sitting within a non-echogenic area (white arrow) that is likely clot free serum.

would seem unwise to discontinue anticoagulation in a patient with LAA thrombus and a persistent communication with the left atrium as demonstrated by persistent flow into the appendage.

Our patient, however, had a successful result from her LAA closure. Despite this, the patient had a thrombus in her LA appendage. The etiology of the thrombus was likely periprocedural with the remaining blood in the appendage clotting leaving serum around it. This is a rare case of a patient with a known thrombus in the LA appendage without communication to the LA. Her situation became even more unique when she was started on amiodarone and needed DFTs. The presence of the thrombus created a dilemma; is it safe to do DFTs in this patient? Also, the patient was adequately anticoagulated prior to the DFT. If one were to try and treat the thrombus, it would be a challenge as the appendage was isolated from the bloodstream.

In the end, logic dictated that an embolic threat would be a real threat if the thrombus was continuous with the bloodstream. In the case, the LA appendage could be regarded as an isolated chamber and did not increase the patient's risk of embolism during or after DFT.

Conclusions:

Presence of a thrombus in the LAA, after successful LAA closure, does not preclude safe DFT, given adequately anticoagulation and imaging prior to the DFT. The LAA could be regarded as an isolated chamber and does not increase the patient's risk of embolism during or after DFT.

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