

**Coiling of Left atrial appendage after failed surgical ligation in patient with recurrent GI bleeds**

**Kashif Shaikh, Nagarjuna Gujjula, Moeed Ahmed, Kanmantha Reddy,  
Himanshu Agarwal**

## **Case History:**

77 year-old female was referred to our structural clinic for left atrial appendage (LAA) occlusion. Her medical history was significant for severe mitral regurgitation due to flail P2 segment. She had undergone mitral valve repair and LAA ligation six months before seeing us in clinic. She was off anticoagulation after surgery given multiple admissions to hospital for gastrointestinal bleeding. While off anticoagulation she experienced transient ischemic event few months after surgery and at that time it was suggested that she continue oral anticoagulation (OAC) indefinitely. Soon after initiation of OAC, she experienced another episode of GI bleeding requiring admission to hospital. To evaluate the LAA, Transesophageal (TEE) was performed which showed over sewn LAA but with severe residual flow in and out of the LAA. There were two separate jets noted (Figure 1). The largest opening was measured to be 0.64 cm. Given the paucity of options to close the LAA using current LAA occlusion devices, closure through endovascular coiling was planned.

## **Procedure details**

Patient was brought to catheterization lab in a fasting state. A TEE was performed continuously to guide transseptal puncture and placement of coils.

The Trans-septal sheath was positioned in the left atrium, and the Protract pig tail wire was advanced into the left atrium. ML 1 sheath was placed in the left atrium. TEE revealed presence of 2 orifices with residual leak. The inferior opening which was closer to the mitral valve was about 5 mm in diameter and the superior opening was about 1-2 mm in diameter. Left atrial angiography was performed which showed Significant flow into the left atrial appendage (Figure 2). With the help of fluoroscopy and transesophageal echocardiography 018 Glide wire advantage was advanced with the help of a 4 French 120 cm angled glide catheter. Once the wire was noticed to be in the LAA the glide catheter was placed deep inside the appendage. We then advanced the 2., 035 20 x 50 mm Azure Cx coil under fluoroscopic guidance and released in the usual fashion. Once these framing coils were all were firmly in place then two more 0.035, 20 x 29 mm Azur CX were placed in a sequential fashion. After placing four coils there was complete obliteration of flow which was confirmed by TEE and angiogram of the left atrium (Figure 3).

TEE was repeated 4 weeks after the procedure which showed a small leak towards the mitral valve side by color doppler and Definity. The leak measured at 3.5 mm (Figure 4). With no to-fro color flow.

## **Discussion:**

Several imaging and autopsy based studies have shown that left atrial appendage (LAA) is the principal site of thrombus formation serving as the source of emboli leading to ischemic stroke. Oral anticoagulation therapy is effective in preventing stroke in majority of patients. However, 30-40% of patients are not on OAC due to some contraindications(1). In a recent left atrial appendage occlusion study (LAAOS) suture exclusion of LAA failed in 55% of patients. Failure was defined as residual flow into the appendage or residual neck >1 cm on TEE performed 8 weeks after procedure(2). In other retrospective study of 137 patients from Cleveland clinic showed that success rate of suture exclusion was only 23% and was 0% for stapler exclusion based on post procedure TEE(3). Endovascular coiling have been utilized for different clinical indication i-e for cerebral aneurysms, renal and pulmonary avms among several other indications. Recent study by Della Roca et al. of 30 patients with residual significant leak after undergoing transcatheter LAA occlusion (watchman-25, Amulet-2 and LARIAT-3) showed that the success of endovascular coiling in 93 % of patients. Residual leak was categorized as severe, 5-mm-diameter jet; moderate, 3- to 4-mm-diameter jet; mild to minimal, 1- to 2-mm-diameter jet; or none, no leak seen on TEE. Device success was defined as evidence of no-flow or mild to minimal residual jet (1 to 2 mm) at the end of the procedure and after 60 ±15 days post-procedure(4).

Our patient though underwent surgical ligation but had significant residual flow. She was unable to continue OAC long term due to significant bleeding complications. Given the inability to seal off LAA with transcatheter devices, the residual leak was closed using endovascular coils. Our patient showed residual leak of 0.35 cm with no to and fro motion seen in left atrial appendage. Data from some randomized trials such as PROTECT AF suggests the safety of discontinuation of oral anticoagulation with residual peridevice flow <5 mm(5).

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