



Successful Percutaneous Retrieval of an Embolized Amplatzer Amulet Left Atrial Appendage Closure Device in the Left Ventricular Outflow Tract in a Patient with a Bio-prosthesis in the Aortic Position

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Case:

An 80-year-old man with a medical history of Diabetes Mellitus, Hypertension, Dyslipidemia, former smoker, prostatic hypertrophy and multifactorial CRF in renal replacement therapy with hemodialysis. Undergoing recovery of aortic valve replacement with a 23 mm sutureless Bio-prosthesis and coronary artery bypass grafting one month earlier who presented a postoperative atrial fibrillation with a CHAD₂DS₂-VASc of 6 and HASBLED of 3, deciding to start oral anticoagulation therapy. The patient was readmitted for significant anemia and secondary cardiac decompensation in a short period of time with no evidence of active bleeding. Studies were conducted finding an active duodenal angiodysplasia. It was decided to stop anticoagulation therapy with consultation to the Electrophysiology clinic and scheduled for a LAA closure device implantation

The procedure was performed under conscious sedation, the maximal diameter of the ostium and landing zone were 17 and 16 mm by echo and 16 mm by fluoroscopy, based on this estimation a 22-mm Amplatzer Amulet device was chosen and implanted in the intended position under TEE and fluoroscopic guidance, we performed proper maneuver and color doppler TEE to confirm stability and good seal of the device. The patient remained stable and was transferred to the hospitalization ward

Systematic follow-up by transthoracic echocardiography at bedside in the coronary unit revealed migration of the device into the LVOT, with no obstruction of the prosthesis. The patient was asymptomatic and due to his multiple comorbidities and high surgical risk it was decided a percutaneous approach. Two 14 Fr FlexCath sheath were placed in the femoral vein and artery. Fluoroscopic image showed the device trapped in the LVOT. We performed a first attempt to retrieve the device by transseptal route with an 18 mm one-snare Hooker Retrieving system and TEE guidance but was unsuccessful. Then via femoral artery with the 14 Fr Sheath positioned in the descending aorta, and through an 8 Fr AL1 catheter and a Safari2 guidewire we pass an 18 mm one-snare into the LV, after a few attempts we were able to grab the distal tip of the device and cautiously retracted the device through the bio prosthesis and into the sheath to finally withdrawn the whole system. Intraoperative transesophageal echocardiography did not showed signs of damage to the bio prosthesis. The main accesses were closed with 2 proglides and "Figure of eight" suture for the vein access. The patient had an asymptomatic evolution with clinical and hematological stability, was evaluated by the team of gastroenterologist who decided conservative treatment for high risk and anatomic reasons and was discharged 1 week after the procedure and referred to the outpatient cardiology clinic with subcutaneous anticoagulation.



Discussion:

The Amulet is a second-generation device with low rates of acute and chronic major adverse events, device embolization varies in published studies, with ranges between 0-2%, with the occurrence mainly early after the procedure. It's an uncommon but potentially life-threatening complication, with clinical manifestations that range from an incidental finding, to arrhythmias, heart failure, cardiogenic shock or sudden cardiac arrest. The main causes for dislocation are device or patient's related, including incorrect sizing, suboptimal placement, variability in LAA anatomy and limited shapes of the occluders

Another aspect is deciding the access for percutaneous retrieval, and this is related to the location of the device. The most frequent locations are the LA, LV and aorta, as in this case we first opt for the transseptal approach, due to the technical difficulty of retrieving the device through the bio-prosthesis, but after various unsuccessful attempts, we decided the trans-arterial approach. If this had not been feasible, the other options were to perform a bidirectional approach, using the transseptal and trans-arterial access to retrieve the device, and finally, if this had not work either the last option was the surgical approach

Conclusion:

Most of the device migration occur during or immediately after the procedure. The location of the embolized device as well as anatomical peculiarities determined the retrieval route. In most cases devices that embolized to the LA were retrieved with transseptal approach, devices that embolized in the aorta were retrieved with the trans-arterial approach, and devices that embolized in the LV were removed surgically.

Percutaneous retrieval is a valid option, but the operators need to know the proper techniques and materials to performed it safely without adding unnecessary risk to the patient