



A successful minimally invasive mitral valve repair following delayed device embolization in a patient with Pascal device implantation

Pascal cihaz implantasyonu yapılan bir hastada geç cihaz embolizasyonunu takiben başarılı bir minimal invaziv mitral kapak tamiri

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Severe mitral regurgitation (MR) is associated with a significant increase in mortality and morbidity, irrespective of its etiology.^[1,2] In recent years, transcatheter mitral valve repair (TMVR) systems have been continuously evolving as a treatment option for patients with an increased risk for surgery. The PASCAL system (Edwards Lifesciences, Irvine, CA, USA) is based on the concept of the edge-to-edge technique (Alfieri stitch). Due to its design, the PASCAL system may overcome some limitations previously reported for the MitraClip® system (Abbott, Abbot Park, IL, USA) which was the first edge-to-edge TMVR device with broad market adoption. Experiences regarding the PASCAL system are still limited. Herein, we report a delayed device embolization case after PASCAL implantation. To the best of our knowledge, only a few cases of acute embolization have been reported during the acute deployment of the MitraClip.^[3,4]

A 83-year-old male patient with systemic hypertension, chronic kidney disease (glomerular filtration rate 45.20 mL/min/1.73 m²), obstructive sleep apnea, and a Society of Thoracic Surgeons-

Predicted Risk of Mortality (STS-PROM) score of 2.9% was admitted to our heart center with signs of cardiac decompensation (New York Heart Association functional Class III) 45 days after an initially successful TMVR procedure for severe degenerative MR using two PASCAL devices. Two weeks after implantation, the patient was admitted to the emergency room of an external center with a pulseless left leg and an episode of severe acute recurrent heart failure. Transthoracic echocardiography (TTE) revealed severe MR with a central jet. The correct position of the first PASCAL device placed at the level of A1/P1 was confirmed, while the second one which was placed at the level of A2/P2 was no longer visible by echocardiography (Figures 1a,b; Video 1). Computed tomography revealed embolization of the second device to the left common iliac artery, requiring vascular surgery to remove the device and resolve acute leg ischemia (Figures 1c, d). Afterwards, the patient was referred to our hospital to be evaluated for surgical and interventional options by our interdisciplinary Heart Team. Taking into consideration the high risk of recurrent MR after a new TMVR attempt, the patient was scheduled for

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minimally invasive mitral valve surgery. A written informed consent was obtained from the patient.

At the beginning of the procedure, transesophageal echocardiography (TEE) confirmed severe MR with a central jet and the coexistence of a cleft between P2 and P3 (Figures 1e, f). A minimally invasive periareolar approach was utilized and the mitral valve was visualized using a three-dimensional (3D) endoscope.^[5] Intraoperatively, one of the implanted devices was found to be correctly attached to the A1/P1 scallops. Since the device did not show any fibrous encapsulation, the decision to remove the device was taken to preserve the valve integrity for the purpose of possible mitral valve repair (Figure 1g). The device was able to be removed with sharp dissection of the leaflet edge captured by the grasping device arms and by gently pushing it toward the apex and, then, pulling

it back (Figures 1h and 1i; Videos 2 and 3). Following closure of the cleft between P2 and P3, two artificial Gore-Tex™ (Gore-Tex; WL Gore & Associates Inc., Flagstaff, AZ, USA) chords were implanted to correct the prolapsing P2 segment. The repair was completed with implantation of a 32-mm semi-rigid Memo 3D ring (Livanova Group, Milan, Italy). Intraoperative TEE and discharge TTE showed no residual MR. The patient had an uneventful recovery and was discharged on postoperative Day 6.

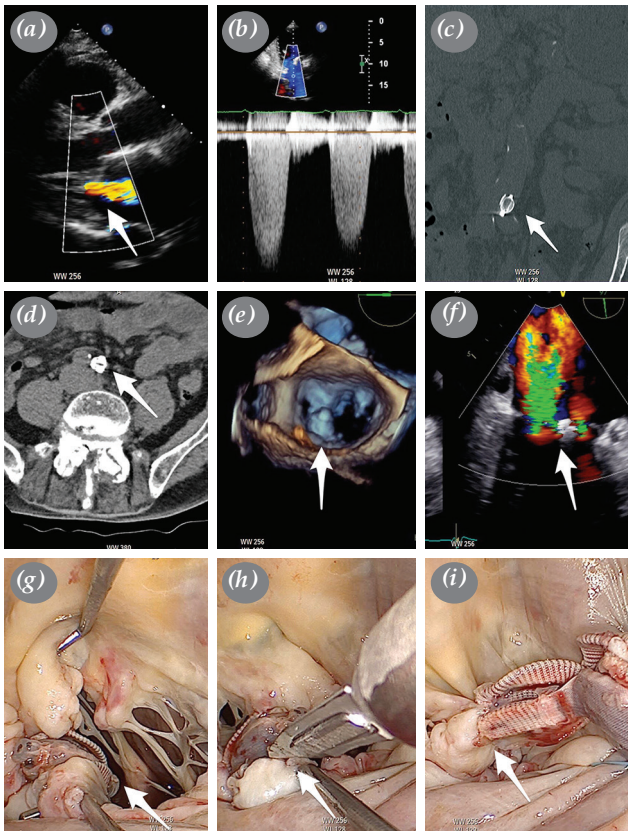
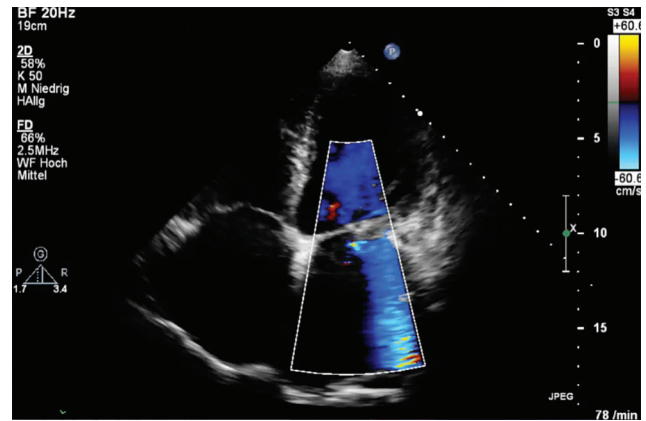
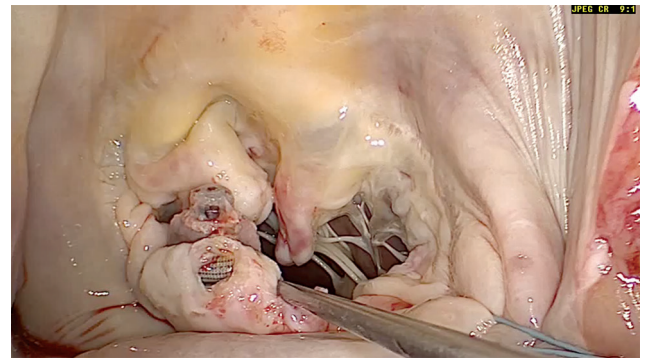


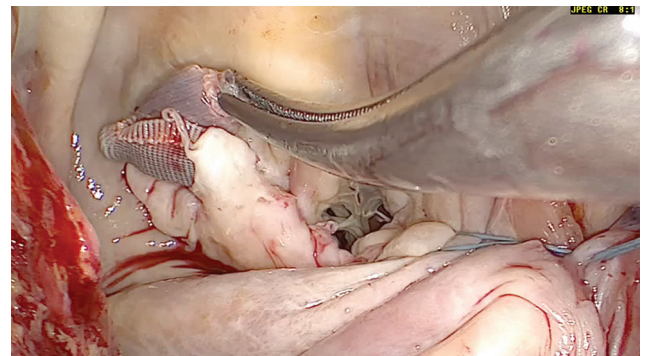
Figure 1. (a, b) Preoperative transthoracic echocardiography showing recurrent severe mitral regurgitation with a central jet. (c, d) A clip embolization to left common iliac artery. (e, f) Perioperative transesophageal echocardiography showing severe mitral regurgitation and correct position for one of the devices, but the second device initially placed at the level of A2-P2 was unable to be found. (g, h, i) The surgical removal of the PASCAL device to maintain valvular integrity, facilitating subsequent surgical valve repair.



Video 1. Severe mitral regurgitation with a central jet and the PASCAL device at the level of A1 and P1.



Video 2. The sharp dissection of the leaflet edges.



Video 3. The removal of the clip by gentle pulling back.

In conclusion, this paper reports the first case of delayed device embolization after an initially successful PASCAL implantation. If device failure occurs early after implantation, the PASCAL device can be removed safely, while preserving the leaflet integrity which allows surgical mitral valve repair.

Declaration of conflicting interests

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