

# LEFT ATRIAL WALL DISSECTION AFTER MITRAL VALVE REPLACEMENT

KYUNG WOO KIM, MD, JUN HYUN KIM, MD, SE HYEOK PARK, MD, SANG-IL LEE, MD,  
JI YEON KIM, MD, PHD, KYUNG-TAE KIM, MD, PHD, WON JOO CHOE, MD, PHD,  
JANG SU PARK, MD, PHD AND JUNG WON KIM, MD, PHD

DEPARTMENT OF ANESTHESIOLOGY AND PAIN MEDICINE, INJE UNIVERSITY ILSAN PAIK HOSPITAL, GOYANG, KOREA

Left atrial dissection does occur, though rarely, after mitral valve surgery. A 68-year-old Korean female presented with moderate mitral stenosis, mild mitral regurgitation, moderate tricuspid regurgitation and mild aortic regurgitation. She was scheduled for mitral valve replacement and tricuspid annuloplasty. We experienced a left atrial dissection after weaning from cardiopulmonary bypass and decided not to repair it. The patient recovered uneventfully. We suggest that a specific type of left atrial dissection can be treated conservatively.

**KEY WORDS:** Atrium · Dissection · Mitral valve.

## INTRODUCTION

Left atrial (LA) dissection does occur, though rarely, after mitral valve surgery.<sup>1)</sup> In previous reports, surgical correction was the preferred method resulting in high mortality. We experienced a LA dissection after weaning from cardiopulmonary bypass (CPB) and decided not to repair it. The patient recovered uneventfully. Hence, we suggest that a certain type of LA dissection can be treated conservatively.

## CASE

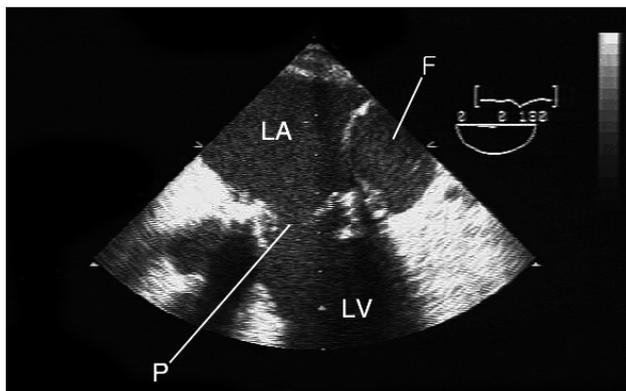
A 68-year-old Korean female presented with moderate mitral stenosis, mild mitral regurgitation, moderate tricuspid regurgitation and mild aortic regurgitation. She had no past medical history other than valve diseases and was scheduled for mitral valve replacement and tricuspid annuloplasty. Standard monitors were placed, and right radial arterial cannulation was done for continuous blood pressure monitoring. After preoxygenation, general anesthesia was induced with propofol and remifentanyl, infused with a target-site concentration-control infusion device (Base Prima Orchestra, Fresenius Vial, Brezins, France). Tracheal intubation was done with a 7.0 mm tube and a triple lumen central catheter (via left subclavian vein) and Swan-Ganz catheter (PAC: Swan-Ganz CCombo V Model 774HF75w; Edwards Lifesciences LLC,

Irvine, CA, USA) (via right internal jugular vein) were placed. Continuous cardiac output monitoring and mixed venous oxygen saturation monitoring was done by CCO/Oxymetry/volumetric monitor (Vigilance Monitor; Edwards Lifesciences LLC, Irvine, CA, USA). Transesophageal echocardiography (TEE) findings were consistent with previous transthoracic echocardiography (TTE). During surgery, radiofrequency ablation was done around the coronary sinus and pulmonary vein box lesion, and right side Maze procedure was done. The mitral valve was replaced with a St. Jude Medical (St. Jude Medical Inc., St. Paul, MN, USA) supra-epic 29 mm tissue valve. The LA auricle was externally obliterated with a 5-0 prolene continuous suture and a tricuspid annuloplasty was done with a Duran ring (Medtronic, Minneapolis, MN, USA) 27 mm. After closing the atrium, the patient was weaned off cardiopulmonary bypass with inotropic support of 5 µg/kg/min of dobutamine. The TEE exam during weaning showed a well-seated prosthetic valve and no paravalvular leakage; however, the patient developed posterolateral atrial wall dissection. A false chamber formed in the LA wall and was 2 × 2.5 cm in size (Fig. 1). A surgeon explored the heart externally but could not find any engorgement. The TEE showed small blood flow pouring into the false chamber but it decreased and disappeared in 30 minutes. The false chamber did not

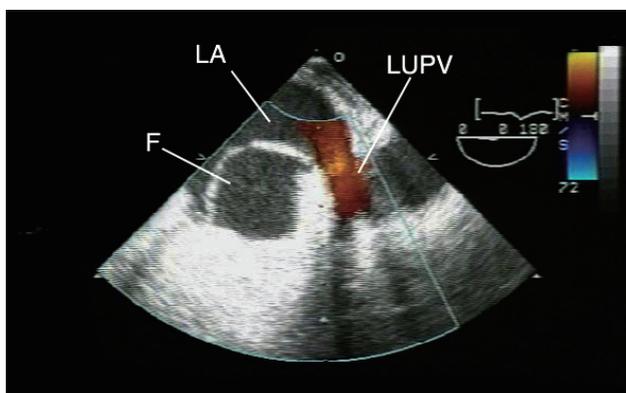
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• Address for Correspondence: Jun Hyun Kim, Department of Anesthesiology and Pain Medicine, Inje University Ilsan Paik Hospital, 170 Juhwa-ro, Ilsanseo-gu, Goyang 411-706, Korea Tel: +82-31-910-7067, Fax: +82-31-910-7184, E-mail: ishmael1@naver.com

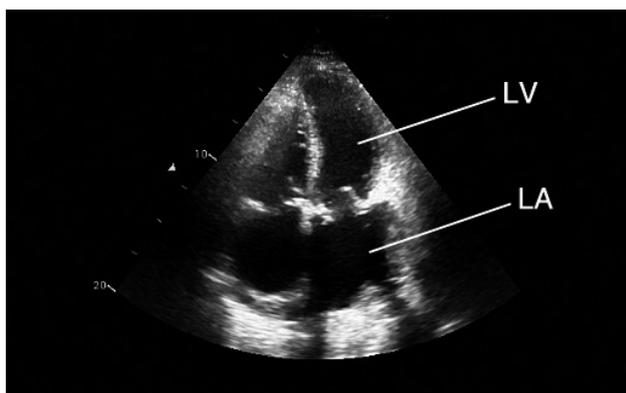
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**Fig. 1.** Midesophageal four chamber view of transesophageal echocardiography showing false chamber at posterolateral left atrial wall. LA: left atrium, LV: left ventricle, F: false chamber, P: prosthetic mitral valve.



**Fig. 2.** Midesophageal four chamber view of transesophageal echocardiography showing well preserved pulmonary venous flow despite of false chamber. LA: left atrium, F: false chamber, LUPV: left upper pulmonary vein.



**Fig. 3.** Apical four chamber view of post-op 6 days follow-up transthoracic echocardiography. False chamber was not observed at the location of transesophageal echocardiography finding. LA: left atrium, LV: left ventricle.

seem to increase in size and showed spontaneous echogenic contrast, that is, no communication with the true atrial space. Additionally, the pulmonary venous flow was not hindered by that chamber (Fig. 2). We had a discussion with the surgeon and concluded the risk of re-exploring and repairing the dissection exceeded that of the dissection itself. The patient was

uneventfully weaned off CPB. Total CPB time was 4 hours 47 minutes; the aortic cross clamp time was 3 hours 45 minutes. Follow-up TTE taken 6 days after surgery showed normal pulmonary vein flow, and the false chamber was not visible (Fig. 3). The patient agreed to have her case presented to the public for academic purposes.

## DISCUSSION

LA dissection defined as the forced separation of layers of the left atrial wall by blood or fluids. It is a rare complication after mitral valve replacement. Retrospective ultrasonography review done over 478 patients after mitral valve prosthesis surgery diagnosed 4 LA dissections (0.84%).<sup>1)</sup> Tang and Liu<sup>2)</sup> suggested several possible mechanisms which includes 1) excessive traction on the sutures in the posterior annulus resulting in tearing through tissues and disruption; 2) debridement of a very calcified valve and inadvertent injury to the endocardium of the LA during the time of the LA thrombectomy; and 3) improper handling of the mitral annulus with a size mismatch of the prosthesis and the annulus. In our case, a small feeding vessel flow in the false chamber disappeared in minutes after its discovery. Therefore, we suspect that there was a disruption at that area from the LA manipulation during CPB, and then, as the weaning process continues, increased blood pressure made the blood accumulate in the false chamber. Most LA dissections in previous reports had openings or communication between the true LA lumen or paravalvular area. Those dissections were aggravated and needed repair. However, our case seems to be resolved spontaneously. Maybe that was because it did not have any communicating channel to the true lumen, so the pressure inside the false lumen did not increase, and a dissecting force was absent. In our case, dissection was located almost on the inferior surface of the heart, so the external examination by the surgeon did not reveal any engorgement. The TEE findings can be a useful diagnostic tool in these disease entities. Due to its location, reexploration and repair of the dissection may not have been easy. We decided not to repair it after confirming the pulmonary venous flow was not hindered. It should have been ideal to perform TEE after the surgery to evaluate false chamber status, but at least, follow-up TTE showed no evidence of false chamber enlargement. There is possibility that a false lumen is hard to be fully seen with TTE follow-up. However, there was no elevation of the pulmonary artery pressure or any symptoms of pulmonary congestion during the recovery period.

However, there is a case report describing spontaneous intramural hematoma development which caused chest pain, severe pulmonary hypertension, and left ventricular inflow obstruction.<sup>3)</sup> In that case, the size of the hematoma grew to be 6.4 × 5.2 cm in only 8 days, and although its size was big enough to obstruct the left ventricular inflow, they reported there was no significant obstruction to the left pulmonary venous return. The hematoma in that report was much bigger

than in our case so we do not suggest preserved venous return as the only decision-making parameter for conservative treatment.

In conclusion, LA dissection does occur, though rarely, after mitral valve surgery. Careful TEE examination during operation is essential to avoid detrimental results. A certain form of LA dissection can be managed conservatively according to its location, size and entity.

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