

# Case report

## **A rare case of left ventricular pseudoaneurysm after mitral valve replacement.**

### **ABSTRACT**

We report the case of a 28 years old female patient operated for mitral valve replacement. The baseline postoperative transthoracic echocardiography at 8 weeks after surgery revealed an anechoic addition image of the basal segment of LV posterior wall with a discontinuity between the posterior wall and the plane of insertion of the mitral mechanical valve measuring 26x17 mm. It seems to be limited by the pericardium, filled by color Doppler in diastole and empties in systole very suggestive of LV pseudoaneurysm. The patient was referred to cardiac surgery for surgical repair.

### **KEYWORDS**

Left ventricular pseudoaneurysm, mitral valve replacement, cardiac surgery

### **ABBREVIATIONS**

CT: Computed Tomography

MVR: Mitral valve replacement

MR: Magnetic resonance

LV: Left ventricle

LVPA: Left ventricular pseudoaneurysm

### **1. INTRODUCTION**

Cardiac pseudoaneurysm is defined as a rupture of the myocardium that is contained by pericardial adhesions or the epicardial wall, which needs to be differentiated from true left ventricular (LV) aneurysm.(1)

Pseudoaneurysm is reportedly a rare complication of myocardial infarction. Pseudoaneurysm can also occur after cardiac surgery, chest trauma, and endocarditis (2). Left ventricular pseudoaneurysm (LVPA) after mitral valve replacement (MVR) is a rare condition (3). Knowledge of the clinical profile and natural history of cardiac pseudoaneurysm is limited because of its low incidence. We report a very rare case of left ventricular pseudoaneurysm after mitral valve replacement.

### **2. CASE PRESENTATION**

We present the case of a young female patient of 28 years, who had as a history of articular rheumatism under extencillin since she was 9 years old. She was diagnosed with mitral stenosis in January 2019 for which she was operated in September 2019 with mitral valve replacement. The immediate postoperative echocardiographic assessment period did not reveal any significant abnormalities. The patient was discharged 12 days after cardiac surgery under anticoagulant treatment. she presented 8 weeks after mitral valve replacement surgery for baseline postoperative control of her prosthesis. the clinical examination found a patient in good general condition, afebrile with blood pressure at 123/64mmhg and heart rate at 70 beats per minute without any symptoms or signs of right or left heart failure. on cardiac auscultation, the prosthetic click was audible, with no added murmur and the peripheral pulses were well perceived. The electrocardiogram registered a regular sinus rhythm at 72 beats per minute, fixed PR interval at 160ms, fine QRS without secondary repolarization disorder. Transthoracic echocardiography showed a non-dilated left ventricle (LV), with preserved global systolic function. The basal segment of LV posterior wall was seat of an image of addition with a discontinuity between the posterior wall and the plane of insertion of the mitral mechanical valve. This discontinuity represents the base of an anechoic cavity measuring 26 mm at the level of its implantation base and 17 mm in depth. The cavity is visible on parasternal long axis, parasternal short axis and apical 4-cavity views. It seems to be limited by the pericardium, without a wall of its own (Figure1). It is filled by color Doppler in diastole and empties in systole (Figure 2) without any contraction movement of the wall cavity during systole. This image is very suggestive of LV pseudoaneurysm. The prosthetic mitral valve had a good function with an average transmitral gradient at 3.5 mmHg without pathological paraprosthetic leakage. The patient was referred to cardiac surgery for surgical repair

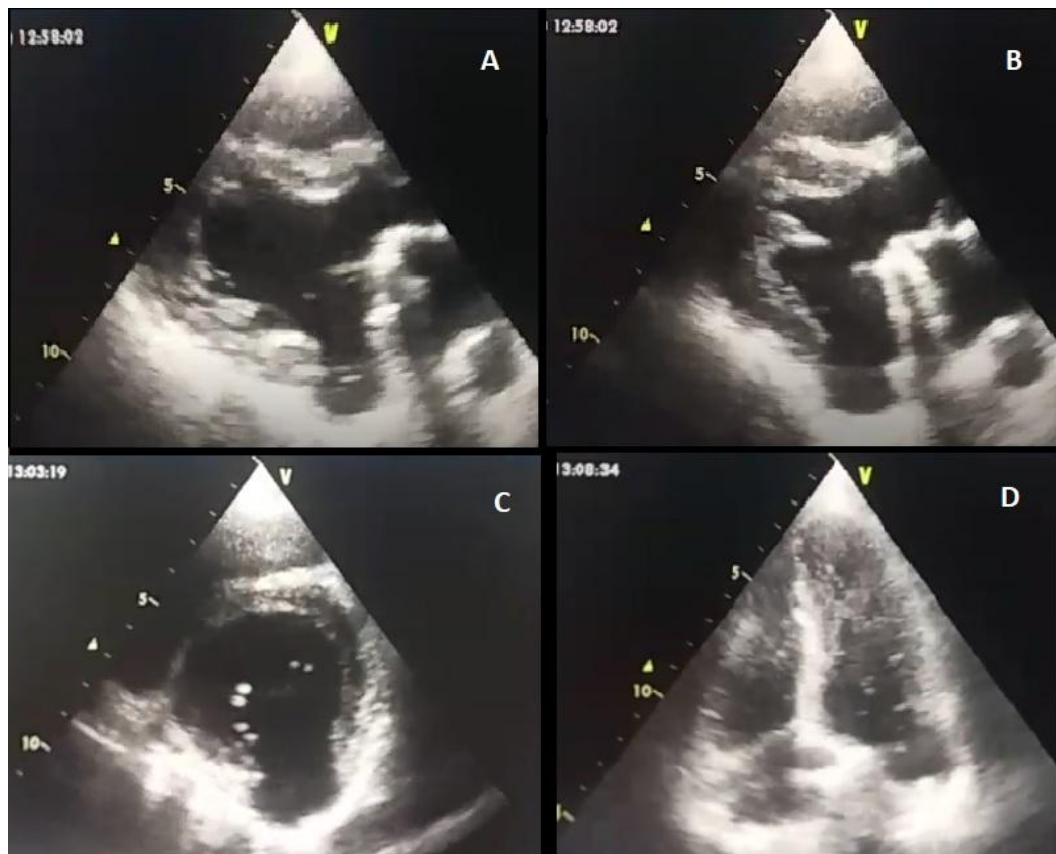


Figure 1: Transthoracic echocardiography (A) Parasternal long axis view during diastole (B) Parasternal long axis view during systole (C) parasternal short axis view (D) Apical 4 chamber view: showing the addition image with LV posterior wall discontinuity suggestive of LV pseudoaneurysm.



Figure 2: Transthoracic echocardiography long axis parasternal view showing the Doppler color filling during diastole of the addition image.

### 3. DISCUSSION

Left ventricular pseudoaneurysm (LVPA) is an infrequent but highly lethal complication of myocardial infarction and mitral valve replacement (MVR) that occurs in less than 0.1% of MVR (4). It can take place after both mitral valve repair and replacement. The incidence of this complication was 0.56% and the mortality rate was 57.4% (5).

Left ventricular pseudoaneurysm after mitral valve replacement resulted from the defect of normal myocardium due to excessive debridement of subannular myocardium, tissue necrosis induced by suturing the prosthetic sewing ring, or being careless in dissection of severe myopericardial adhesions that may increase the risk of left ventricular rupture (6). Localisation of pseudoaneurysm after myocardial infarction is the inferior and posterolateral walls. Post-traumatic pseudoaneurysms are typically found on the anterior wall of the left ventricle, and pseudoaneurysms occurring after infectious endocarditis tend to be located in the mitral-aortic intervalvular fibrosa (2).

Left ventricular pseudoaneurysm develops only when LV rupture is barely contained by adherent pericardium or scar tissue (7).

The diagnosis can be confirmed by doppler echocardiography, which is currently the reference. It provides important information regarding the anatomy and localization of the defect and the presence of a thrombus or associated valvulopathy (8). Computed tomography (CT)- and magnetic resonance (MR)-angiography are alternatives to duplex sonography, although they pose risks due to the use of contrast agents, as well as radiation exposure for CT (9).

Transesophageal echocardiography helps demonstrate the relationship between the pseudoaneurysm and other heart structures. Moreover, transesophageal echocardiography can help establish the paravalvular leak and regurgitation (10). When the diagnosis is established, surgical correction is usually mandatory (11). Although prompt surgical repair have been recommended as the method of first choice to prevent LVPA rupture, surgical repair may be hesitant because of the high mortality rate (5).

### 4. CONCLUSION

LV pseudoaneurysm is a very rare finding after mitral valve replacement, the diagnosis is made with echocardiography and treatment is based on surgical correction.

### 5. BIBLIOGRAPHY

1. Kaur N, Panda P, Choudhary AK, Sharma YP. Left ventricular pseudoaneurysm: imaging. *BMJ Case Rep.* juin 2021;14(6):e243913.
2. Yeo TC. Clinical Profile and Outcome in 52 Patients with Cardiac Pseudoaneurysm. *Ann Intern Med.* 15 févr 1998;128(4):299.

3. Keskin M, Kemalolu Öz T, Mahir Atasoy M, Atasoy I, Ösken A, Kemal Tuygun A. Multiple Imaging Modalities Including Three-Dimensional Echocardiography in Left Ventricular Pseudoaneurysm After Mitral Valve Replacement. *J Heart Valve Dis.* juill 2016;25(4):459-62.
4. Arnaz A, Akansel S, Yalcinbas Y, Saygili A, Sarioglu T. Transcatheter Closure of Left Ventricular Pseudoaneurysm After Mitral Valve Replacement. *Ann Thorac Surg.* août 2020;110(2):e123-5.
5. Duan Q-J, Duan C-T, Yang W-J, Dong A-Q. Conservative treatment of left ventricular pseudoaneurysm after mitral valve replacement due to early left ventricular rupture: a case report. *J Cardiothorac Surg.* 6 avr 2021;16(1):69.
6. Watanabe A, Kazui T, Tsukamoto M, Komatsu S. Left ventricular pseudoaneurysm and intracardiac fistulas after replacement of mitral valve prosthesis. *Ann Thorac Surg.* mai 1993;55(5):1236-9.
7. Karlson KJ, Ashraf MM, Berger RL. Rupture of Left Ventricle Following Mitral Valve Replacement. *Ann Thorac Surg.* nov 1988;46(5):590-7.
8. Zouari F, Tlili R, Azaiez F, Zayed S, Ben Romdhane R, Ziadi J, et al. Thrombosed left ventricular pseudoaneurysm following myocardial infarction: a case report. *J Med Case Reports.* déc 2021;15(1):258.
9. Peters S, Braun-Dullaes R, Herold J. Pseudoaneurysm. *Hamostaseologie.* août 2018;38(3):166-72.
10. Şahan E. Left ventricular pseudoaneurysm after mitral valve replacement: Review of pseudoaneurysms late after mitral valve replacement. *Herz.* août 2015;40(5):778-82.
11. Zhang Y, Yang Y, Sun H-S, Tang Y. Surgical Treatment of Left Ventricular Pseudoaneurysm. *Chin Med J (Engl).* 20 juin 2018;131(12):1496-7.