



HUGE UNRUPTURED ANEURYSM OF THE LEFT VENTRICLE AFTER SILENT INFARCTION: DIFFICULTIES OF MANAGEMENT THROUGH A CASE

Jaafar Rhissassi^{*1}, Hicham Wazaren², Hanae Bouhdadi³, Chakib Benlafqih⁴, Rochde Sayah⁵ and Mohammed Laaroussi⁶

^{1,2}Department of Cardiovascular Surgery A of Ibn Sina University Hospital Center, Mohammed V University of Rabat, Morocco.

^{3,4,5,6}Cardiovascular Surgery A Department of Ibn Sina University Hospital Center, Mohammed V University of Rabat, Morocco.

***Corresponding Author: Jaafar Rhissassi**

Department of Cardiovascular Surgery A of Ibn Sina University Hospital Center, Mohammed V University of Rabat, Morocco.

Article Received on 29/10/2020

Article Revised on 19/11/2020

Article Accepted on 09/12/2020

ABSTRACT

Aneurysm of the left ventricle is rare with a prevalence of 0.05%. Transthoracic echocardiography is the main means of diagnosis. These are the works of Dor on the importance of maintaining kinetics and an elliptical ventricular geometry that had developed left ventricle repair. This is a 67-year-old male who was admitted with dyspnea. Transthoracic echocardiography revealed a large apical aneurysm of the left ventricle. Magnetic resonance imaging confirmed the diagnosis of the aneurysm. The coronary angiography revealed a left anterior descending artery occlusion and tight stenosis of the right coronary artery. The surgical correction consisted of the technique of DOR.

KEYWORDS: Aneurysm, left ventricle, DOR, coronary angiography, tamponade, myocardial infarction.

BACKGROUND

Left ventricular aneurysm is a very rare condition because, in most cases, rupture of the free wall of the ventricle leads to fatal pericardial tamponade.^[1] Myocardial infarction is the most common cause of aneurysms of the left ventricle.^[2] The rupture occurs in about 4% of patients with myocardial infarction resulting in patient collapse.^[3]

Since left ventricular aneurysms have a strong tendency to rupture, this disorder can lead to death if not treated surgically.

In this paper, we report the case of a patient who underwent a successful repair of a huge left ventricular aneurysm, following a myocardial infarction caused by left anterior descending artery occlusion.

CASE PRESENTATION

This is a 67-year-old patient with chronic smoking who was admitted to the emergency department setting with NYHA stage IV dyspnea associated with mottling of the extremities.

The chest x-ray showed cardiomegaly with a 65% cardiothoracic index, a sub-diaphragmatic tip and bilateral hilar overload. The electrocardiogram was

recorded in a regular sinus rhythm with Q necrosis waves in the anterior.

Transthoracic echocardiography revealed an apical akinesia, infero-septal and inferior hypokinesia. A large apical aneurysm of the left ventricle, measuring approximately 58mm in longitudinal diameter (Figure 1).



Figure 1: Trans-thoracic ultrasound section showing the huge left ventricular aneurysm.

Magnetic resonance imaging (MRI) confirmed the diagnosis of the aneurysm and allowed a good evaluation of the ventricular function (Figure 2: A and B).

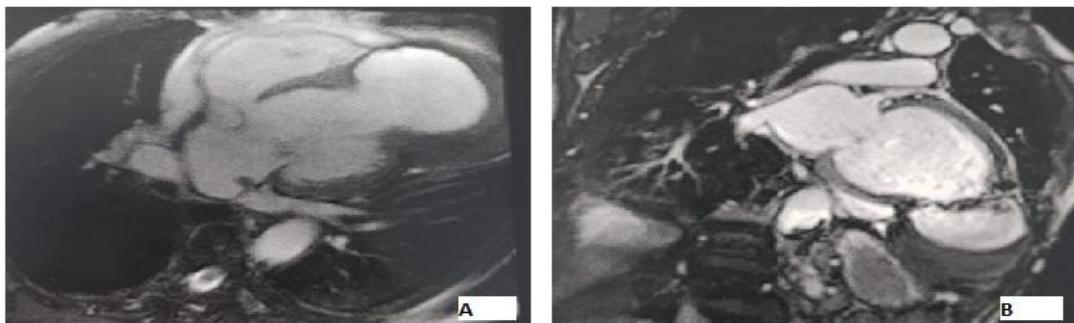


Figure 2 (A and B): Magnetic resonance imaging sections showing left ventricular aneurysm.

The coronaryography revealed a left anterior descending artery occlusion (IVA) and tight stenosis of the second portion of the right coronary artery.

After stabilization, the patient was scheduled for a surgical cure. The approach was vertical median sternopericardiotomy with right leg approach for saphenous vein removal.

Cardiopulmonary bypass was conducted in moderate hypothermia, between an aortic cannula at the foot of the brachiocephalic arterial trunk and two venous cannulas as well as a left ventricular discharge cannula via the right upper pulmonary vein. Myocardial protection was provided by blood cardioplegia.

The surgical correction consisted of the technique of DOR. This procedure was introduced by the French cardiac surgeon Vincent Dor in 1932. It is also known as endoventricular circular patch plasty (EVCPP). The objective is restoring a dilated left ventricle (LV) to its elliptical geometry. The Dor procedure uses a circular suture and a Dacron patch to correct LV aneurysm and exclude scarred parts of the septum and ventricular wall.

To begin basic remodeling, we started with an incision in the center of the depressive area of the left ventricle wall (Figure 3).



Figure 3: Operative view showing LV aneurysm.

Then, thrombectomy of a large intra-aneurysmal clot with elimination of endocardial scar tissue was performed (figure 4).



Figure 4: Operative view showing intra-aneurysmal thrombi in the left ventricle.

To return the heart to its elliptical shape, an endoventricular suture was placed and longitudinal folding was performed to bring the cardiac apex from the back to the front (Figure 5).

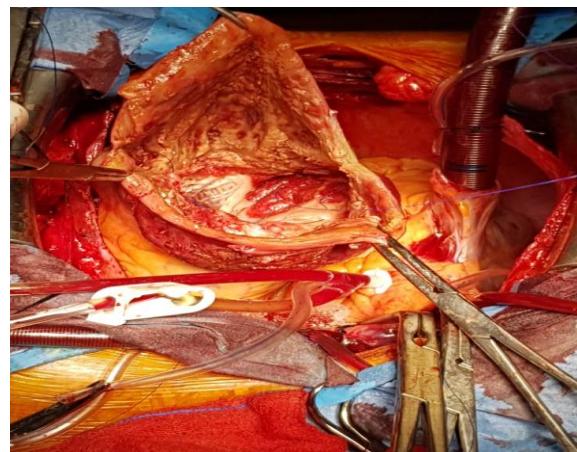


Figure 5: Operative view showing the appearance after ventriculotomy and thrombectomy.

The suture also serves as a guide for patch placement. A balloon was then inserted into the ventricular cavity to ensure a correct size and thus guiding the suture of a Dacron patch. The balloon was deflated and removed before complete closure. The non-viable fibrous tissue was pulled out of the patch and surgical glue was used to complete the closure (Figure 6).

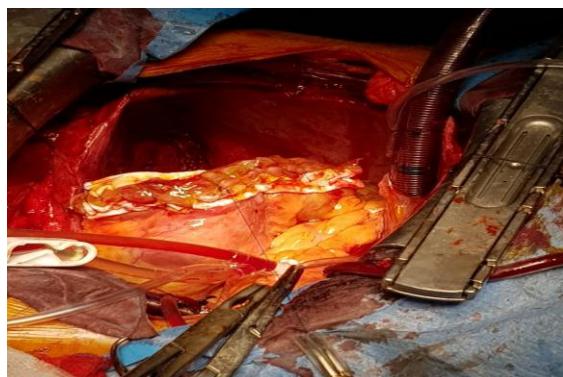


Figure 6: Operative view showing the technique of repair of the left ventricular aneurysm.

The coronary artery bypass grafting was performed by an internal saphenous vein on the right coronary artery and by the left internal mammary artery sequentially on the left anterior descending artery and the diagonal. The stay in intensive care lasted 10 days.

DISCUSSION

Aneurysm of the left ventricle is rare with a prevalence of 0.05%.^[4] Inferior and posterolateral myocardial infarction are responsible for 82% of aneurysms.

Left ventricular aneurysms are associated with a mortality rate approaching 50%. This is, mainly; due to rupture, a thromboembolic complication or a ventricular arrhythmia.

Transthoracic echocardiography is the main means of diagnosis.^[5] It shows the pseudoaneurysm, its dimensions and the impact on the left ventricular function as well as the filling pressures.

Coronary angiography is an indispensable tool. It provides information on the possibility of coronary artery bypass surgery associated with the repair of the aneurysm.^[6]

According to the recommendations of the American College of Cardiology, American Heart Association (ACC-AHA, Class I recommendation), surgical repair should not be postponed, regardless of the patient's clinical condition.^[7]

Despite adequate management, the prognosis of this pathology is poor, with an estimated mortality of 30-45%. Prognostic factors are mainly represented by systemic arterial pressure, right atrial pressure and extracorporeal circulation time.^[8]

The first interventions of a ventricular aneurysm were described in 1944 by Beck, who carried out an external reinforcement of the aneurismal wall by the fascia lata fascia. The first repair of a direct linear suture aneurysm under extracorporeal circulation was described by Cooley and al. in 1958.^[9]

These are the works of Dor et al. and Jatene.^[10] on the importance of maintaining kinetics and an elliptical ventricular geometry that had developed left ventricle repair.

ABREVIATION

VG: ventricule gauche

DOA: name of a surgeon

NYHA: new York heart Association

MRI: magnetic resonance imaging

EVCPP: endoventricular circular patch plasty

LV: left ventricle

MI: myocardial infarction

ACC: American college of cardiology

AHA: american heart association

CONCLUSION

Aneurysms are a rare complication of myocardial infarction. The spontaneous evolution is most often towards rupture with sudden death by tamponade. These lesions are therefore eminently surgical.

REFERENCES

1. Vlodaver Z, Coe JI, Edwards JE. True and false left ventricular aneurysms. Propensity for the latter to rupture. Circulation, 1975; 51: 567-572. DOI: 10.1161/01.cir.51.3.567.
2. Hung MJ, Wang CH, Chang WJ. Unruptured left ventricular pseudoaneurysm following myocardial infarction. Heart, 1998; 80: 94-97. PMCID: PMC1728750.
3. Falcao JL, Falcao SN, Garcia MF, Arruda AL, Hueb AC, et al. Left ventricular pseudoaneurysm associated to severe mitral insufficiency, complicating inferolaterodorsal acute myocardial infarction. Arq Bras Cardiol, 2005; 84: 488-491. DOI: 10.1590/s0066-782x2005000600011.
4. Mahilmaran A, Nayar PG, Sheshadri M, Sudarsana G, Abraham KA. Left ventricular pseudoaneurysm. Tex Heart Inst J., 2002; 29: 122-125. PMCID: PMC116739.
5. Lazopoulos G, Manns-kantartzis M, Kantartzis Giant Left Ventricular Aneurysm and IntraventricularSeptal Defect after Silent Myocardial Infarction. Hellenic J Cardiol, 2009 Mar-Apr; 50(2): 142-3. PMID: 19329416.
6. Roelandt JR, Sutherland GR, Yoshida K, Yoshikawa J. Improved diagnosis and characterization of left ventricular pseudoaneurysm by Doppler color flow imaging. J Am Coll Cardiol, 1988; 12: 807-811. DOI: 10.1016/0735-1097(88)90325-7.
7. Ryan TJ, Antman EM, Brooks NH, Califf RM, Hillis LD, Hiratzka LF, et al. 1999 update: ACC/AHA guidelines for the management of patients with acute myocardial infarction: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction) J Am Coll Cardiol, 1999; 34(3):

- 890–911. DOI: 10.1016/s0735-1097(99)00351-4.
8. Rachko M, et al. Late Occurrence as Complications of an Acute Myocardial Infarction: Ventricular Septal Defect and Left Ventricular Aneurysm. *Jpn Heart J.*, 2000; 41(6): 773–779. DOI: 10.1536/jhj.41.773.
9. Cooley DA, Collins HA, Morris GC. Ventricular aneurysm after myocardial infarction: Surgical excision with use of temporary cardiopulmonary bypass. *J Am Med Assoc*, 1958 May 31; 167(5): 557–60. DOI: 10.1001/jama.1958.02990220027008.
10. Dor V, Saab M, Coste P, Kornaszewska M, Montiglio F. Left ventricular aneurysm: a new surgical approach. *Thorac Cardiovasc Surg*, 1989; 37(1): 11. DOI: 10.1055/s-2007-1013899.