

Multiple cardiac valvulopathy stenosis: About one case

Sara Ratbi¹, Nadia charaf², bouchra es-sabi³, Ilyass Asfalou⁴, Zouhair Lakhal⁵, El Mehdi Zbir⁶

Summary: We report the case of a 28 - year - old female patient with triple stenosis: aortic, mitral and tricuspid. The proximal lesion was the dominant and the patient was admitted with right heart failure. The doppler echocardiogram revealed a rheumatic origin of the disease and quantified the different stenosis and their repercussions. Trivalvic surgery remains associated with high mortality despite advances in surgical techniques and intensive care units.

INTRODUCTION:

Multiple cardiac valvulopathies are mostly of rheumatic origin. They represent 20% of cardiac valvulopathies in the Euro Heart Survey (1). They are characterized by a great clinical variability due to the diversity of the possible associations. They are also difficult to quantify and the surgical indications usually overlap. These lesions may involve 3 valves and most often correspond to the association of mitro-aortic valvulopathy and functional tricuspid insufficiency. A triple organic attack is rare. This may include stenosis and leakage but rarely a triple stenosis. We describe the case of a 28 - year - old woman with aortic, mitral and tricuspid stenosis.

PATIENT AND OBSERVATION:

Ms F.B. 28 years consulted on 07/03/15 for dyspnea stage III and palpitations. She has a medical history of recurrent untreated throat infections during her childhood. Her symptoms started back 3 years by the installation of neglected stage II dyspnea. The evolution was marked by the worsening dyspnea becoming stage III and the frequent palpitations. Clinical examination found a conscious patient with dyspnea at the slightest effort, tachycardia at 100 beats per minute, with the presence of peripheral edema arriving mid-legs and spontaneous turgidity of jugular veins. Cardiac auscultation finds a diastolic murmur and a burst of B1 at the mitral valve, a harsh systolic murmur rough radiating to the left edge of the sternum and to the vessels of the neck at the aortic valve, diastolic murmur at the tricuspid valve, and a burst of B2 pulmonary. There were no signs of left heart failure. The electrocardiogram recorded a regular sinus rhythm at 100 beats per minute. The blood test showed no particular results apart from a slight iron deficiency anemia at 11 g / dl.

The transthoracic echocardiography found all the mitral valves, aortic and tricuspid reworked, thickened, calcified with limited opening and a dome opening of the tricuspid valve. The mitral and aortic surfaces were evaluated by planimetry

showing a tight mitral stenosis of 1cm² and a severe aortic stenosis of 0.9cm². The surface of the tricuspid orifice was measured by three - dimensional ultrasound and was 0.7 cm². The transtricuspidian gradient was at 8.43 mmHg. There was a minimal mitral and tricuspid regurgitation and aortic regurgitation grade I. The left ventricle was not dilated, but bloated with good systolic function calculated at 60%. The right ventricle was not dilated and had good systolic function. The atria were moderately dilated. There was no intra cavitory thrombus. Pulmonary arterial hypertension was high at 60 mm Hg.

The patient had a triple valvular replacement using mechanical prostheses on the mitral and aortic valves, and bioprosthesis on the tricuspid valve with no complications. She was discharged under medical treatment including an antivitamin K with a target INR between 3 and 4.

Figures:

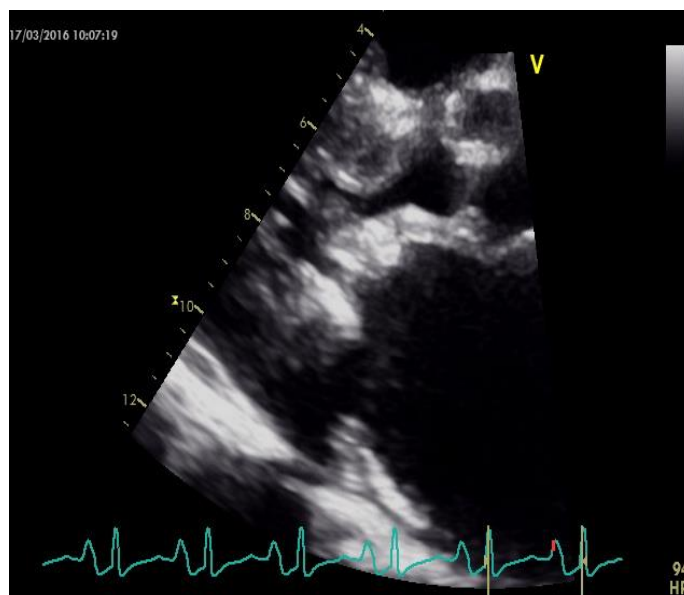


Figure 1: Large - axis left parasternal cut showing the rearranged, thickened and calcified aspect of the mitral and aortic valves.

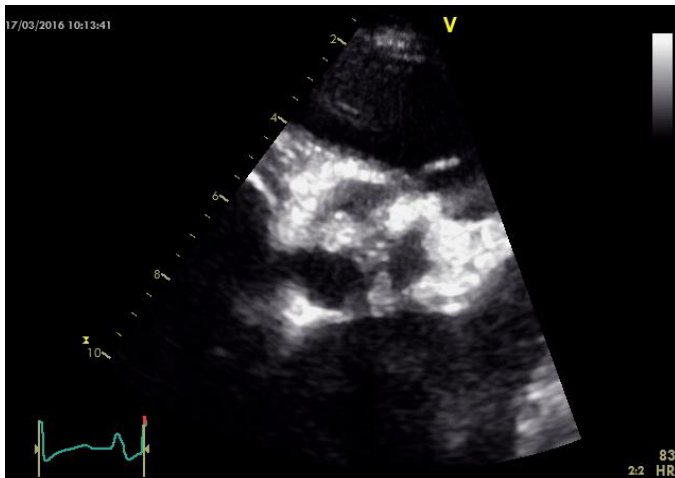


Figure 2 :Cross sectional view showing the rheumatic aspect of the aortic valve

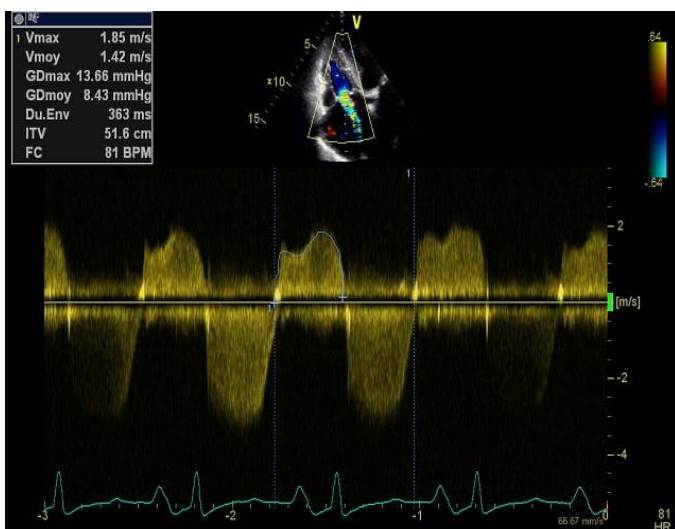


Figure 3: Median transtricuspidian gradient at 8.43mmHg showing atricuspid narrowing

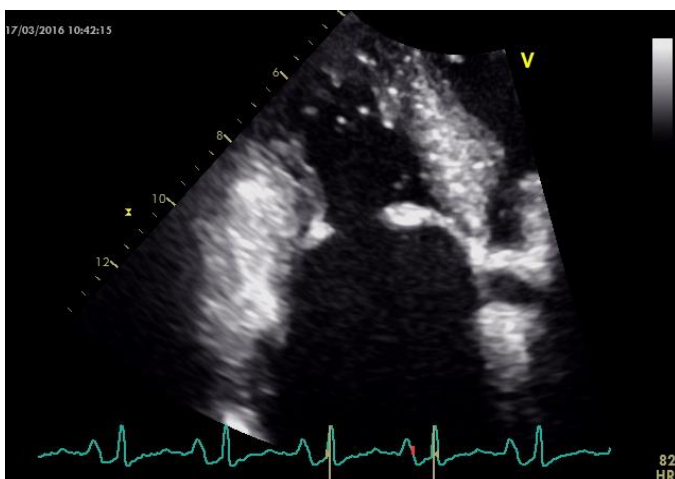


Figure 4: Apical section of the 4 cavities centered on the right cavities showing the dome opening of the tricuspid valve

DISCUSSION:

There are many researchs and articles regarding the single cardiac valvulopathies in the medical literature but very few related to multiple cardiac valvulopathies (2,3,4) due to a large number of possible combinations. The case of our patient is very rare as it has a triple stenosis mitral, aortic and tricuspid.

Both patients with single cardiac valvulopathy and multiple cardiac valvulopathies should be well evaluated by studying the etiology of its involvement, its mechanism, its severity and its impact.

Multiple valvulopathies can be acquired or congenital. In our country, the most commonly acquired etiology is acute rheumatoid arthritis as it is the case of our patient. Other causes include endocarditis, thoracic and mediastinal radiotherapy, and medication side effects (5,6).

The clinical symptoms of patients with multiple cardiac valvulopathy result from the combined hemodynamic effect resulting from the severity of each single lesion. The symptomatology of the proximal lesion is dominant in the case of lesions of equal severity. In our case, the signs of right heart failure were present.

The doppler echocardiogram is the key exam for the assessment of multiple valvular disorders. The ultrasound allows a fine analysis of the morphology and the kinetics of the valves. The Doppler studies the velocity and direction of the orificial flows. It is necessary to study each valve, knowing that the hemodynamic interactions between the valvular lesions may modify the interpretation of the validated indices for the monovalvular lesions. However, quantification methods that are least dependent on load and flow conditions should be favored: planimetry for valvular stenosis, the surface of the regurgitant orifice and veina contracta for leakage. For the tricuspid valve, the orifice surface can only be measured by three-dimensional ultrasound.

Regarding the impact, the presence of a stenosis upstream of the left ventricle will protect the latter from the hemodynamic repercussion of the downstream stenosis: in this case the ventricle is small and hypertrophied. This is the case with our patient. Whereas the presence of a tricuspidian narrowing associated with a mitral narrowing may have a protective effect on the right ventricle due to the attenuation of the transtricuspidian gradient by the decrease in cardiac output generated by the mitral stenosis.

From a therapeutic point of view, the optimal management of patients with multiple valvular lesions requires a perfect knowledge of the hemodynamic interactions, the natural history of these valvulopathies, the clinical symptomatology at



rest and during effort, the morphology of the valve, the severity of the attack, the repercussions on the left and right heart chambers, and the elevation of pulmonary pressures.

In our case, considering the very altered and calcified aspect of the valves, a triple replacement (mitral, aortic and tricuspidian) was envisaged. This trivalvular surgery remains associated with a greater perioperative risk and lower survival despite advances in surgical techniques, myocardial protection and postoperative intensive care(7,8).

CONCLUSION:

Various combinations of valvular lesions can be encountered, especially in our country where acute rheumatoid arthritis remains a public health problem. The lack of data for each specific situation does not allow for the proposal of a standardized management strategy based on evidence. Prudent quantification and a complete evaluation of the consequences of valvular lesions are necessary to adapt an optimal therapeutic approach for each patient.

RÉFÉRENCES:

1. Iung B, Baron G, Butchart EG, et al. A prospective survey of patients with valvular heart disease in Europe: The Euro Heart Survey on Heart Disease. *Eur Heart J* 2003;24:1231–43.
2. Unger P, Rosenhek R, Dedobbeleer C, Berrebi A, Lancellotti P. Management of multiple valve diseases. *Heart* 2011;97:272–7.
3. Joint Task Force on The Management of Valvular Heart Disease of the European Society of Cardiology (ESC), European Association for Cardio-Thoracic Surgery (EACTS), Vahanian A, Alfieri O, Andreotti F, Antunes MJ, et al. Guidelines on the management of valvular heart disease (version 2012). *Eur Heart J* 2012;33:2451–96.
4. Nishimura RA, Otto CM, Bonow RO, et al. Practice Guideline. 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am CollCardiol* 2014;63:e57–185.
5. Roberts WC, Dangel JC, Bulkley BH. Nonrheumatic valvular cardiac disease: a clinico-pathologic survey of 27 different conditions causing valvular dysfunction. *CardiovascClin* 1973;5:333e446.
6. Carlson RG, Mayfield WR, Normann S, et al. Radiation-associated valvular disease. *Chest* 1991;99:538e45.

7. Alsoufi B, Rao V, Borger MA, et al. Short- and long-term results of triple valve surgery in the modern era. *Ann ThoracSurg* 2006;81:2172e8.

8. Mueller XM, Tevæarai HT, Ruchat P, et al. Perioperative morbidity and mortality in combined aortic and mitral valve surgery. *J Heart Valve Dis* 1997;6:387e94.