



(CASE REPORT)



## AN UNUSUAL CASE OF SEVERE RHEUMATIC TRICUSPID STENOSIS ASSOCIATED WITH SEVERE MITRAL STENOSIS: A HEMODYNAMICALLY CHALLENGING SITUATION

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### ABSTRACT

**Background:** Tricuspid stenosis is a rare valvular disease that is seldom isolated and is most frequently associated with mitral valve involvement. Although rheumatic fever primarily affects the cardiac valves, other cardiac structures may also be involved during rheumatic carditis.

**Case summary:** We report the case of a 38-year-old man with no cardiovascular risk factors and a history of recurrent childhood tonsillitis, acute rheumatic fever, and hypothyroidism treated with levothyroxine. He was admitted to the cardiac intensive care unit for acute congestive heart failure. Transthoracic echocardiography revealed severe mitral stenosis associated with severe tricuspid stenosis and left ventricular systolic dysfunction. The coexistence of these lesions resulted in a particularly complex hemodynamic situation, making surgical decision-making challenging.

The patient underwent mechanical mitral valve replacement combined with tricuspid bioprosthetic valve replacement, with an uneventful postoperative recovery.

**Keywords:** Rheumatic heart disease; Tricuspid stenosis; Mitral stenosis; Valve replacement.

### 1 INTRODUCTION

Tricuspid stenosis is an uncommon valvular disorder, accounting for less than 1% of acquired valvular heart diseases. In most cases, it is of rheumatic origin and only exceptionally occurs as an isolated lesion, being usually associated with mitral valve disease. The coexistence of severe mitral stenosis and severe tricuspid stenosis leads to complex hemodynamic interactions that may delay diagnosis and complicate therapeutic management. We report the case of a patient presenting with this unusual combination.

## 2 CASE PRESENTATION

A 38-year-old man with no cardiovascular risk factors was admitted to the cardiac intensive care unit because of progressive dyspnea associated with bilateral lower-limb edema extending to the knees.

His past medical history included recurrent childhood tonsillitis, acute rheumatic fever, and hypothyroidism treated with levothyroxine.

### 2.1 Physical examination

On admission, the patient was tachypneic with an oxygen saturation of 92% on room air. Blood pressure was 100/60 mmHg, and heart rate was 130 beats/min with a regular rhythm.

Cardiovascular examination revealed a loud first heart sound (S1) and a diastolic rumble. Jugular venous distension, bilateral lower-limb edema, ascites, and bilateral pulmonary crackles were also present.

Laboratory investigations demonstrated an inflammatory syndrome with a C-reactive protein level of 42 mg/L (normal <5 mg/L) and an erythrocyte sedimentation rate of 50 mm/h. No other significant biological abnormalities were observed.

Electrocardiography showed atrial flutter with a rapid ventricular response at 130 beats/min.

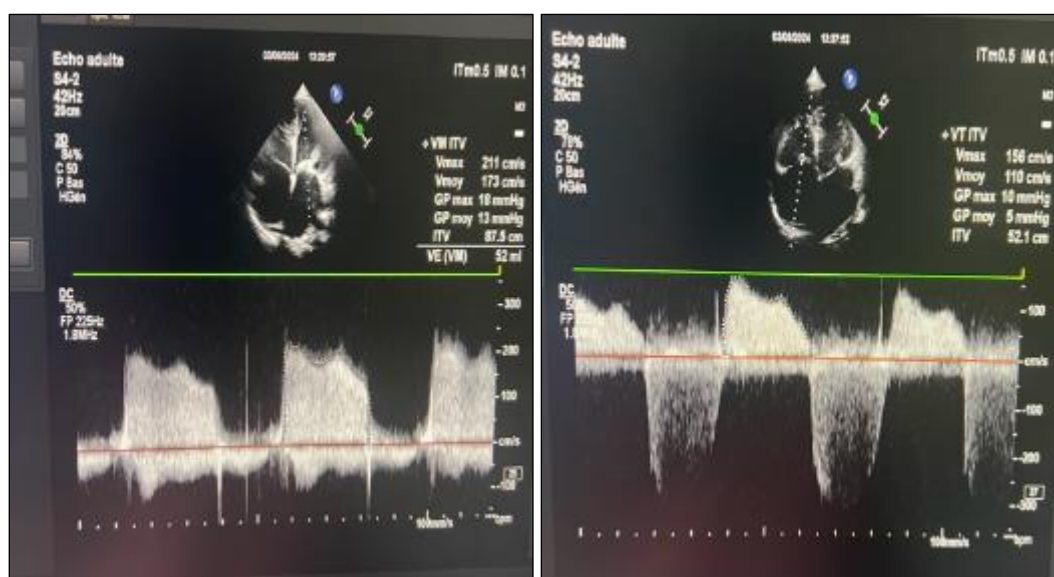
Chest radiography demonstrated cardiomegaly associated with bilateral hilar congestion consistent with pulmonary edema.

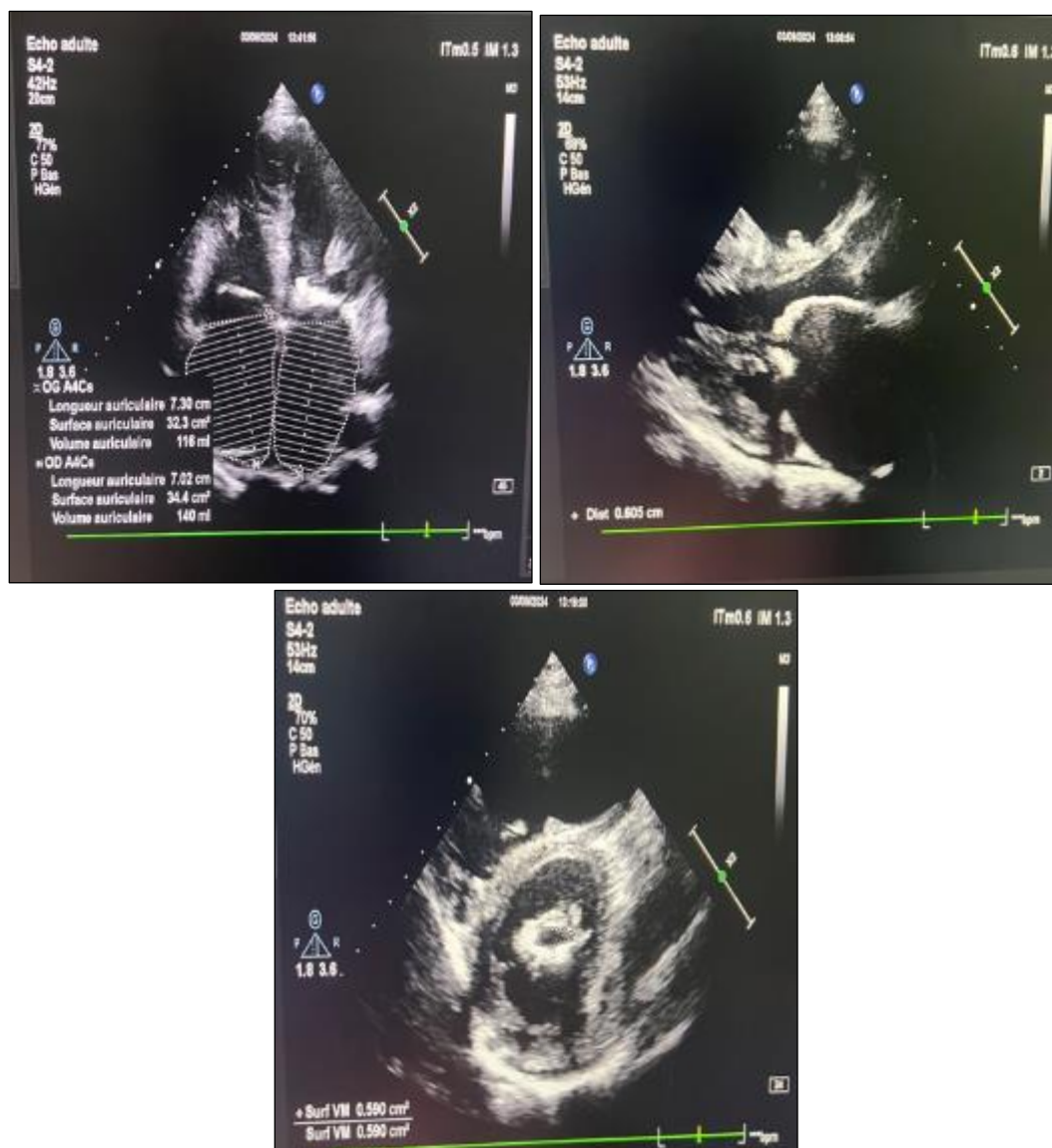
Following hemodynamic stabilization, transthoracic echocardiography revealed:

- Left ventricular ejection fraction of 39%;
- Severe mitral stenosis (valve area 0.6 cm<sup>2</sup>; mean gradient 13 mmHg);
- Severe tricuspid stenosis (mean gradient 5 mmHg; valve area 1.2 cm<sup>2</sup>);
- Moderate tricuspid regurgitation;
- Biatrial enlargement;

Preserved right ventricular longitudinal systolic function.

Pulmonary artery systolic pressure could not be reliably estimated.





**Figure 1: Main echocardiographic findings showing severe mitral stenosis, severe tricuspid stenosis, moderate tricuspid regurgitation, and marked biatrial enlargement.**

The patient subsequently underwent mechanical mitral valve replacement combined with tricuspid bioprosthetic valve replacement, with a favorable postoperative course.

### 3 DISCUSSION

Rheumatic heart disease remains a major cause of valvular heart disease in developing countries and continues to be associated with substantial morbidity and mortality (1,2).

Although all cardiac valves may be affected, rheumatic tricuspid stenosis remains uncommon and occurs only exceptionally as an isolated lesion. It is most frequently associated with mitral valve disease, as observed in our patient (3).

In the present case, the coexistence of severe mitral stenosis, severe tricuspid stenosis, and impaired left ventricular systolic function created a particularly complex hemodynamic situation. Tricuspid stenosis restricts right ventricular filling, reduces cardiac output, and promotes systemic venous congestion. When associated with severe left-sided valvular disease, these hemodynamic interactions complicate both clinical assessment and therapeutic decision-making (4).

The main therapeutic challenge was determining the optimal strategy for the concomitant surgical correction of both valves. Available evidence suggests that tricuspid valve repair or replacement performed during left-sided valve surgery does not significantly increase perioperative morbidity or mortality when appropriately indicated (5). In our patient,

mechanical mitral valve replacement combined with tricuspid bioprosthetic valve replacement resulted in a favorable postoperative outcome.

#### 4 CONCLUSION

This case highlights the rarity of severe rheumatic tricuspid stenosis associated with severe mitral stenosis and illustrates the diagnostic and therapeutic challenges arising from this uncommon combination. Comprehensive echocardiographic assessment is essential to evaluate the complex hemodynamic interactions and guide the surgical strategy. Recent ESC/EACTS guidelines emphasize the importance of multidisciplinary management and individualized therapeutic decision-making in patients with complex multivalvular heart disease (6). Although surgery remains the standard treatment in this setting, ongoing advances in transcatheter mitral and tricuspid valve repair and replacement may offer promising alternatives for carefully selected patients (7).

#### STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

##### *Disclosure of conflict of interest*

The authors declare no conflicts of interest regarding this manuscript.

##### *Statement of informed consent*

Verbal informed consent was obtained from the patient for the publication of this case report.

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