

Case Report

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Diastolic Tricuspid and Mitral Regurgitation in a Patient with Complete Atrio-Ventricular Block

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Abstract

Complete atrioventricular (AV) block is a well-known cause of diastolic AV regurgitation. In patients with complete AV block, the effective and synchronized ventricular systole may not occur at the end of diastole, leading to the incomplete closure of AV valve. And the reversal pressure gradient between ventricle and atrium due to the delay in ventricular systole results in diastolic AV regurgitation. We report a case of tricuspid and mitral regurgitation after new-onset complete AV block.

Keywords: Complete atrioventricular block; Diastolic atrioventricular regurgitation

Case Report

A 78-years old women with a history of aortic valve replacement surgery presented with approximately one week of dyspnea on exertion and dizziness. Previously, his electrocardiogram showed sinus rhythm with left bundle branch block (Figure 1) and mild degree of tricuspid regurgitation was detected by thoracic echocardiogram, but there was no diastolic AV regurgitation (Figure 2). On physical examination, her blood pressure was 166/82, her pulse was slow and regular, and there was a systolic murmur on cardiac apex. Chest X ray on admission revealed cardiomegaly without pulmonary congestion. The electrocardiography showed complete AV block with a heart rate of 38/min (Figure 3). The patient was evaluated by thoracic echocardiography. Thoracic echocardiography showed normally left ventricular ejection fraction with mild left atrial dilatation. Mild to moderate degree of

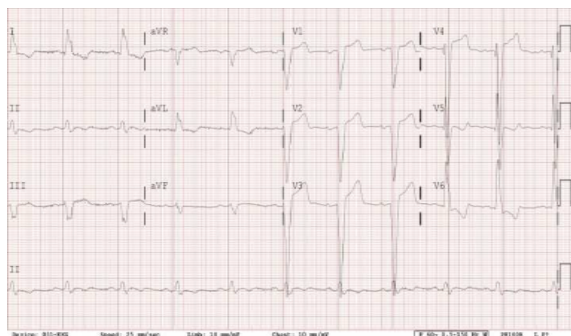


Figure 1: Electrocardiogram showed sinus rhythm with left bundle branch block.

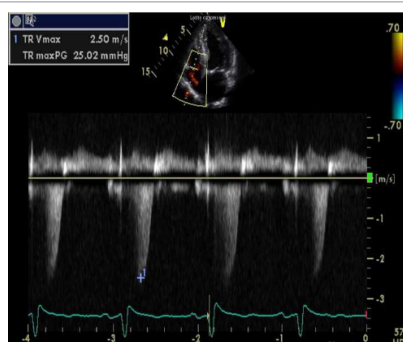


Figure 2: Mild degree of tricuspid regurgitation was detected by thoracic echocardiogram, but there was no diastolic AV regurgitation.



Figure 3: Electrocardiography showed complete AV block with a heart rate of 38/min.

mitral regurgitation and tricuspid regurgitation were demonstrated with diastolic regurgitation. Color flow imaging and continuous-wave Doppler clearly showed diastolic mitral and tricuspid regurgitation (Figure 4). Diastolic regurgitation of mitral or tricuspid valve had a low velocity of 1-2 m/s. [1]. Because the complete AV block did not improved to sinus rhythm, a permanent pacemaker implantation was performed. After then, the diastolic mitral and tricuspid regurgitation disappeared.

Discussion

Diastolic mitral regurgitation has been reported in patients with atrioventricular conduction abnormalities [2]. And tricuspid regurgitation is usually accompanied with diastolic mitral regurgitation. Diastolic mitral regurgitation can also occur in patients with acute severe aortic regurgitation or restrictive cardiomyopathies [3].

Normally the mitral and tricuspid valve closes shortly after the isovolumetric ventricular contraction when the rising ventricular pressure exceeds the atrial pressure. For the complete closure of AV valve, the effective and synchronized ventricular contraction is essential. Incomplete closure of the AV valve is related to valvular regurgitation [1,3-

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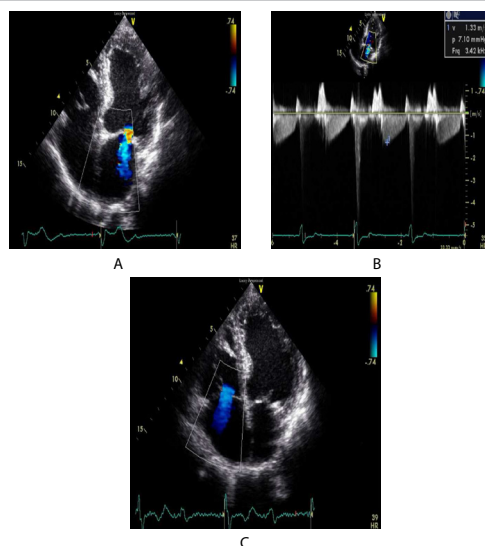


Figure 4: Color flow imaging and continuous-wave Doppler clearly showed diastolic mitral and tricuspid regurgitation.

5]. When the complete AV block is present, the left ventricular end-diastolic pressure could be higher than atrial pressure, leading to the diastolic AV regurgitation through the incompletely closed AV valve [3,6].

Conclusion

In generally diastolic AV regurgitation is a benign phenomenon and it does not have clinical value. But a dual chamber pacemaker may improve a diastolic filling function of ventricle through optimization of AV synchrony, resulting in elimination of diastolic AV regurgitation [3]. This case illustrates newly appeared diastolic AV regurgitation with complete AV block after aortic valve replacement surgery. Diastolic AV regurgitation improved after treatment of AV block.

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