The Egyptian Heart Journal (2015) 67, 167–170

HOSTED BY

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Egyptian Society of Cardiology

The Egyptian Heart Journal

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SHORT COMMUNICATION

Three-dimensional transesophageal echocardiography incremental value in a case with a rare combination of tricuspid valve prolapse and rheumatic mitral valve stenosis

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Received 5 April 2014; accepted 26 June 2014
Available online 30 July 2014

KEYWORDS

Tricuspid prolapse;
Rheumatic mitral stenosis;
3D-TEE

Abstract *Introduction:* The tricuspid valve (TV) is a complex structure (Lamers et al. (1995) [1]). The most common cause of pathologic tricuspid regurgitation is functional, due to annular dilatation with normal leaflet morphology (Sagie et al. (1994) [2]). Myxomatous disease of the tricuspid valve is often associated with mitral valve involvement but isolated tricuspid prolapse has been rarely reported (Tei et al. (1983) [3]). Unlike the common combination between rheumatic mitral valve stenosis and functional tricuspid regurgitation, to the best of our knowledge, this is the first case of such combination between tricuspid valve prolapse and rheumatic mitral valve stenosis reported with three-dimensional transesophageal echocardiography (3D-TEE).

Case presentation: We are presenting a 43-year-old female patient that had dyspnea on effort NYHA class III. A transthoracic echocardiography showed severe rheumatic mitral valve stenosis with severe tricuspid regurgitation. A routine preoperative 2D-transesophageal echocardiography (2D-TEE) showed severe rheumatic mitral valve stenosis with severe tricuspid regurgitation due to prolapse of one of the tricuspid valve leaflets. 3D-TEE showed prolapse of the medial half of the posterior leaflet of the tricuspid valve. These findings were confirmed during surgery and had led to a change in the surgical plan from traditional mitral valve replacement with tricuspid valve annuloplasty, to mitral valve replacement with tricuspid valve anatomical repair.

Conclusion: The tricuspid valve is a complex structure. 2D-TTE and TEE is not usually enough for complete delineation of the anatomy and pathology of the tricuspid valve. 3D-TEE has an incremental value in providing informative en-face view of the three leaflets of the tricuspid

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Peer review under responsibility of Egyptian Society of Cardiology.

http://dx.doi.org/10.1016/j.ehj.2014.06.001

valve that facilitates precise determination of its anatomy and pathology. This is a rare case of unusual combination between tricuspid valve prolapse and rheumatic mitral valve stenosis.

1. Introduction

The tricuspid valve (TV) is a complex structure.[1] It is not usually possible to visualize all TV cusps simultaneously in one cross-sectional view by the standard transthoracic two-dimensional echocardiography (2DE).[4]

Three-dimensional echocardiography (3DE) can provide an informative en-face view of the tricuspid valve from both the ventricular and atrial sides in detail.[5,6]

The most common cause of pathologic tricuspid regurgitation is functional, due to annular dilatation with normal leaflet morphology.[2] The frequency of TR as well as valvular pathology was evaluated in a review of 5223 adults (predominantly male with a mean age of 67) who underwent echocardiography.[7] Moderate to severe mitral regurgitation (MR) was present in 819 (15.7%), but only 8% had primary tricuspid valve pathology.[4] Myxomatous disease of the tricuspid valve is often associated with mitral valve involvement but isolated tricuspid prolapse has been rarely reported.[3] Unlike the common combination between rheumatic mitral valve stenosis and functional tricuspid regurgitation, to the best of our knowledge, this is the first case of such combination between tricuspid valve prolapse and rheumatic mitral valve stenosis to be

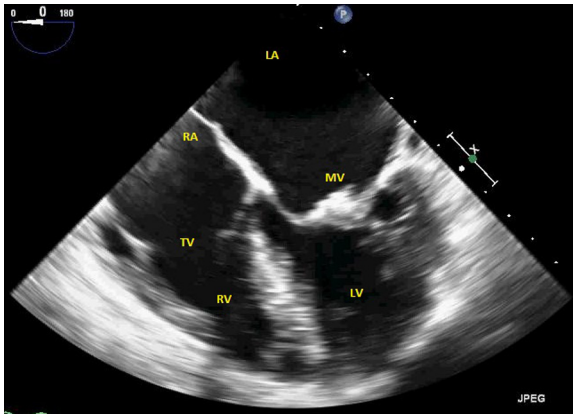

Figure 1 2D-mid-esophageal 4-chamber view, a diastolic frame showing: rheumatic thickening and calcification of the mitral valve with limited diastolic opening, the tricuspid valve is widely open with normal thickness of the two leaflets appearing in the view. LA: Left Atrium, RA: Right Atrium, LV: Left Ventricle, RV: Right Ventricle, MV: Mitral Valve and TV: Tricuspid Valve.

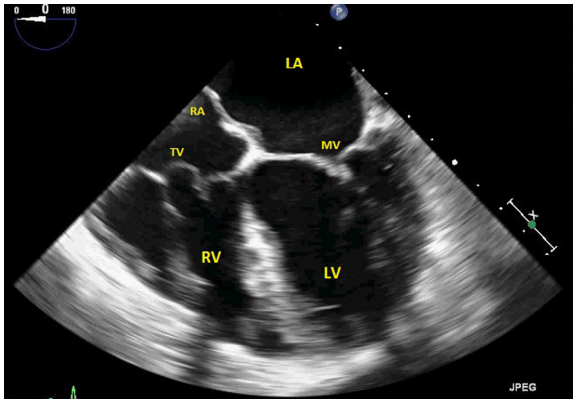

Figure 2 2D-mid-esophageal 4-chamber view, a systolic frame showing: prolapse of one of the tricuspid valve leaflets. LA: Left Atrium, RA: Right Atrium, LV: Left Ventricle, RV: Right Ventricle, MV: Mitral Valve and TV: Tricuspid Valve.

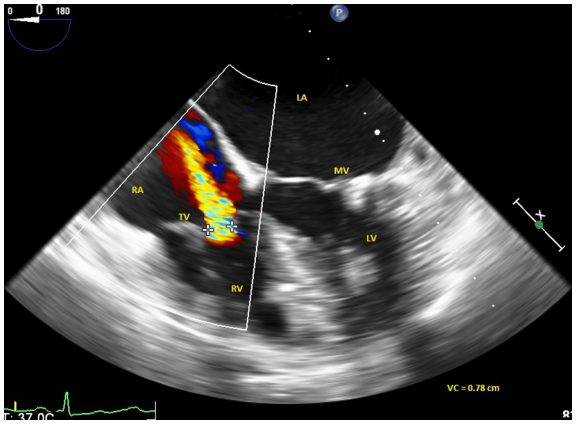

Figure 3 Color/2D-mid-esophageal 4-chamber view, a systolic frame showing: severe tricuspid regurgitation with a vena-contracta (VC) of 0.78 cm. LA: Left Atrium, RA: Right Atrium, LV: Left Ventricle, RV: Right Ventricle, MV: Mitral Valve and TV: Tricuspid Valve.

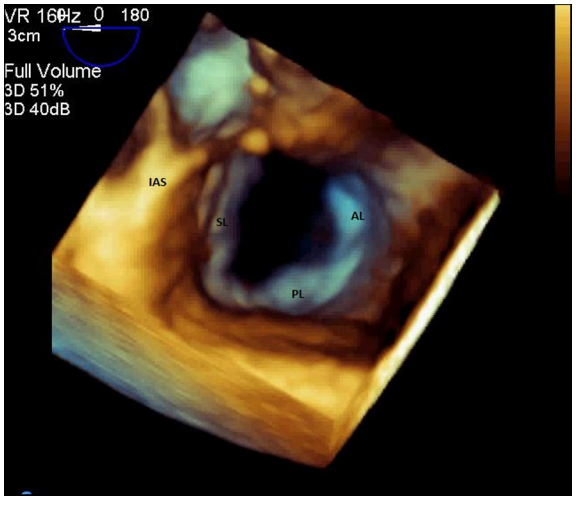

Figure 4 3D-TEE, full volume dataset showing: the three tricuspid valve leaflets from the right atrial perspective in diastole. AL: Anterior leaflet, SL: Septal leaflet, PL: Posterior leaflet and IAS: Inter-atrial septum.