Effect of Tricuspid Stenosis on Tricuspid Anulus Tissue Doppler Imaging Velocities

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A 20-year-old female was referred for echocardiography. Echocardiography showed tight mitral stenosis (MS) with pliable leaflets. Tricuspid leaflets were thick and showed diastolic doming, diagnostic of tricuspid stenosis (TS) (Figure 1). There was no calcification. Pulsed Doppler evaluation of tricuspid flow revealed slow E-F slope with moderate tricuspid regurgitation (Figure 2). Tissue Doppler imaging revealed reduction in early diastolic velocity (Ea) of lateral as well as medial tricuspid anulus (Figures 3, 4). Late diastolic velocity (Aa) velocity was not increased.

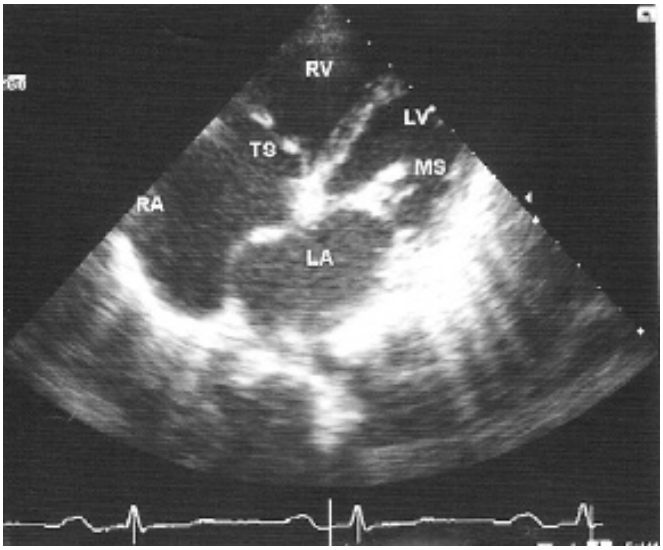

Figure 1. Apical four-chamber view recorded from slightly medial position showing thickened tricuspid leaflets with diastolic doming. Mitral leaflets are also thickened.

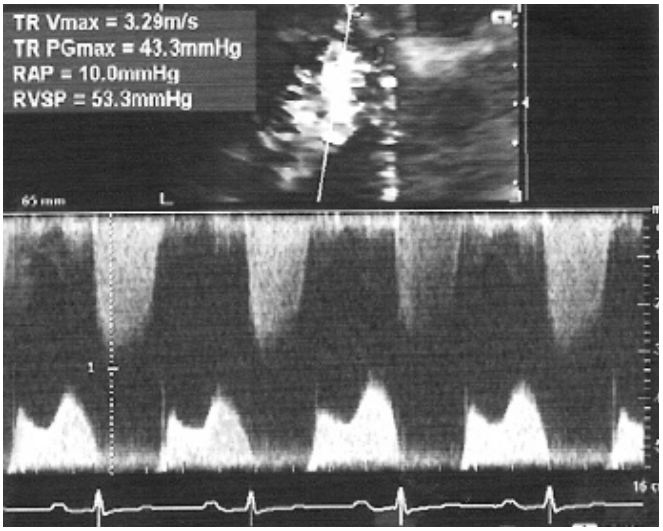

Figure 2. Pulsed Doppler imaging of tricuspid flow showing slow EF slope and concomitant tricuspid regurgitation.

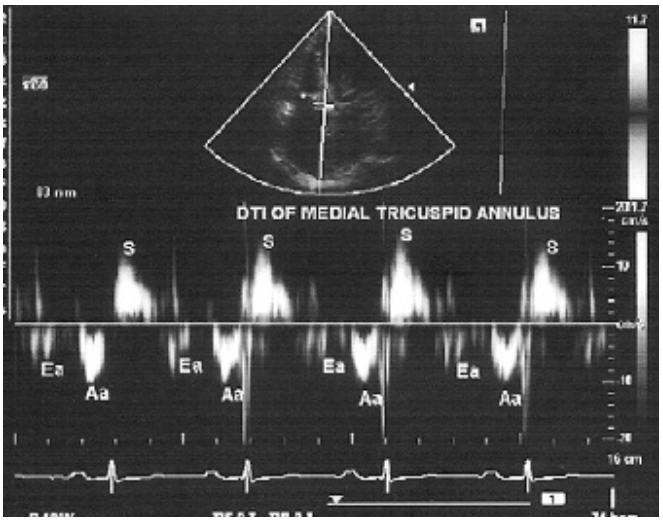

Figure 3. Tissue Doppler imaging from medial tricuspid anulus showing diminished Ea velocity and Aa velocity.

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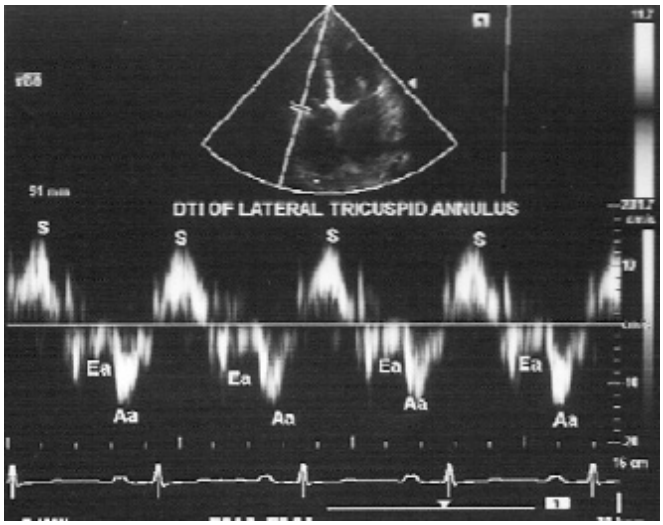

Figure 4. Tissue Doppler imaging of lateral tricuspid anulus showing diminished Ea velocity with normal Aa velocity.

Decreased and slow filling of right ventricle due to TS probably contributed to decreased velocity of Ea wave of tricuspid anulus. Right atrium cannot fill the right ventricle rapidly due to TS. This could contribute to normal or reduced Aa velocity of tricuspid anulus. Pulmonary artery hypertension secondary to MS could affect right ventricular diastolic functions and reduce Ea velocity. Pulmonary artery hypertension is, however, associated with increased Aa velocity which was not the case in our patient. Calcification of anulus can also cause decreased movement. Rheumatic myocarditis could affect right ventricle and could contribute to decreased Ea velocity. Such a pathology is, however, likely, to increase Aa velocity. Subvalvular pathology and ball valve thrombus can also affect tissue Doppler velocities in this scenario. Significant tricuspid regurgitation may also change angle of incidence between systole and diastole in such a scenario.

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Conflict of Interest

None