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Echo Diagnosis of Rheumatic Tricuspid Valve Disease

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Rheumatic tricuspid valve disease (RTVd) remains uncommon. When present, it is almost always associated with rheumatic mitral valve disease (RMVd). Previously reported to occur in 2–22% of patients with RMVd, it appears to be less common today.^{1–4} A reported incidence of RTVd in patients with RMVd was 9.5% (14 of 147) in 1984, from a North American medical center.⁵ It now appears to be less common. The third world and especially the Indian subcontinent still have a significant prevalence of RTVd, occurring mostly in young women.⁶

The clinical findings associated with RMVd are more severe than that of RTVd, making it rather easy to miss the diagnosis of concomitant tricuspid stenosis (TS). It is important to detect tricuspid valve disease, however, as TS may lead to chronic elevation of right atrial pressures, low cardiac output, and venous congestion after surgical or balloon therapy of mitral stenosis (MS).^{7,8}

A markedly dilated right atrium serves as a clue to possible TS. An increase in valve brightness and thickness results from fibrosis, causing deformed tricuspid leaflets, mostly along the free edges of the valve. Calcification is rare. As occurs with the mitral valve, commissural fusion and diastolic doming occurs secondary to the rheumatic process, with resultant restricted motion.

Valve doming may be well seen in a modified parasternal long-axis or apical view. M-mode may reveal a diminished EF slope with diastolic posterior leaflet anterior motion, similar to that noted in MS.^{9–11} (Figs. 1–3, movie clip S1).

Doppler gradients of TS are lower than that of MS. The gradient may be as low as 2 mmHg but rise to 5 mmHg after saline infusion (Fig. 4). Usually RTVd is associated with not only TS and echo valve doming but significant tricuspid

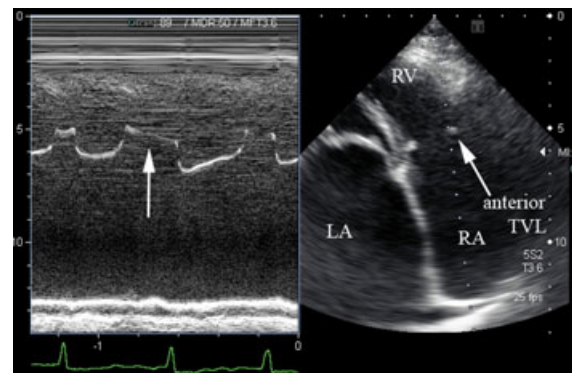


Figure 1. M-mode and two-dimensional-modified apical four-chamber image demonstrates a dilated right atrium (RA) and left atrium (LA). The anterior leaflet of the tricuspid valve (anterior TVL) is bright. M-mode of the tricuspid valve is bright and has a reduced EF slope (vertical arrow).

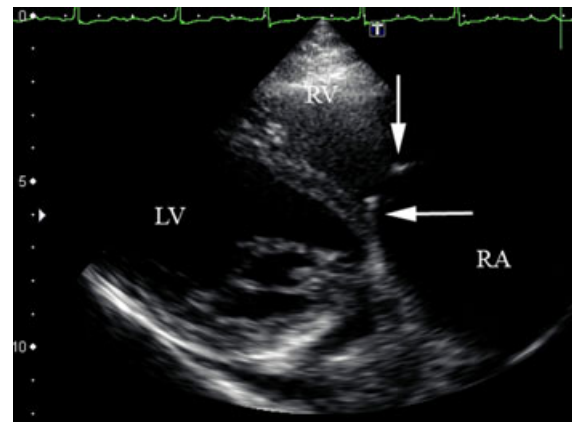


Figure 2. Parasternal right ventricular (RV) inflow demonstrates a bright thickened tricuspid valve with valve diastolic valve doming. LV = left ventricle; RA = right atrium; RV = right ventricle, horizontal arrow = posterior tricuspid valve leaflet; vertical arrow = anterior tricuspid valve leaflet.

regurgitation (TR) (movie clip S2). Patients with pure TR will also have an increased initial tricuspid E velocity, but a rapid deceleration time.

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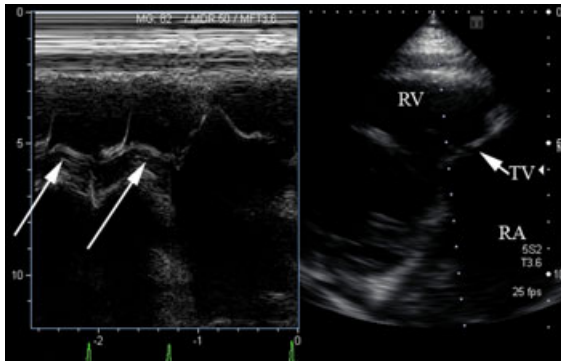


Figure 3. M-mode and two-dimensional parasternal right ventricular (RV) inflow view. M-mode anterior motion (arrows) of the posterior tricuspid leaflet is noted. RA = right atrium; TV = tricuspid valve.

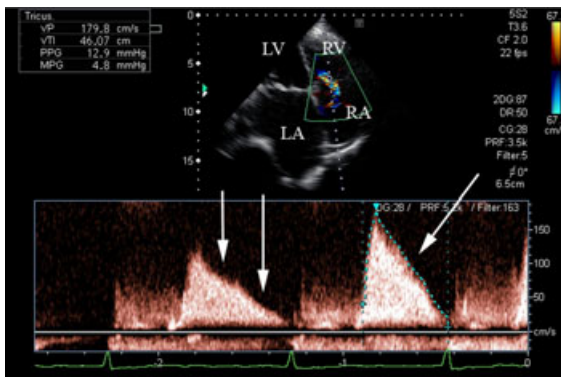


Figure 4. Modified apical four-chamber view with continuous-wave Doppler through the tricuspid valve. The mean pressure gradient for the waveform examined (single arrow) was nearly 5 mmHg. Waveforms demonstrated a relatively slow deceleration time (vertical arrows). LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle.

Those with TS and TR, however, may have a similar initial E velocity, but a slower deceleration time. A pressure half-time formula for TS has not been verified and cannot be used in calculation of tricuspid valve area.^{12–14}

In conclusion, RTVd is an uncommon manifestation of rheumatic heart disease, found even less often than in decades past. When present, it is uniformly associated with RMVd, and is found mostly in young females from third world nations or the Indian subcontinent.

It is important to be aware that RTVd may be present with little clinical findings, particularly

with clinical signs of RMVd present. It is important to look for echocardiographic evidence RTVd in patients with RMVd.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Movie clip S1. Parasternal right ventricular inflow view demonstrates a thick and bright tricuspid valve (posterior and anterior leaflets). Diastolic valve doming is evident.

Movie clip S2. Apical four-chamber view: **A.** valve doming of both the mitral and tricuspid valve and **B.** color Doppler demonstrates significant tricuspid regurgitation.