Midsystolic Sound Associated with A-V Junctional Rhythm*

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During the past 15 years there has been increasing interest in the genesis of midsystolic clicks and sounds emanating from the heart. Such acoustic transients have been ascribed to atrioventricular valve prolapse, myocardial ischemia, rheumatic valvulitis, right ventricular pacing catheters, ventricular aneurysm, aortic dissection and delayed inscription of a semilunar valve ejection click. We report here the appearance of an unusual midsystolic sound in association with an A-V junctional rhythm.

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CASE REPORT

A 30-year-old man with symptomatic aortic stenosis was admitted for valvular replacement. Following implantation of a Starr-Edwards prosthesis, the patient had an A-V junctional rhythm characterized by a narrow QRS complex followed by an inverted P wave in electrocardiographic lead 2. An M-mode echocardiogram obtained during this rhythm disclosed systolic anterior motion of the tricuspid valve in association with the retrograde atrial depolarization on the rhythm strip. Phonocardiography revealed the presence of a midsystolic sound which followed the inverted P wave of the A-V junctional rhythm (Fig 1). After spontaneous conversion to sinus rhythm, repeat echocardiography and phonocardiography did not demonstrate either the tricuspid valve systolic anterior motion or the midsystolic sound.

DISCUSSION

Systolic anterior motion of the tricuspid valve has been reported to occur in association with subvalvular pulmonic stenosis,1 pacing,2 complete heart block,3 pericardial effusion4 and aneurysm of the membranous interventricular septum.5 In some of these settings it is probable that asynchronous atrial and ventricular activation or retrograde atrial depolarization results in the tricuspid valve anterior systolic motion. Systolic anterior motion of the tricuspid valve described here was attributed to retrograde conduction to the right atrium from the A-V junction as revealed by the superior orientation of the P wave on the electrocardiogram. The same phenomenon provides an explanation for the midsystolic transient which disappeared after reversion back to sinus rhythm. This hypothesis is further supported by the fact that there was no prolapse of the mitral and tricuspid valves during both sinus rhythm and the A-V junctional rhythm as determined by echocardiography. Additionally, random inscription of a fourth heart sound during various phases of the cardiac cycle has been noted in the past.6

In conclusion, the combination of tricuspid val-
vular systolic anterior motion and an intermittent midsystolic sound may result from A-V junctional rhythm with retrograde atrial activation.

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REFERENCES


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