ILLUSTRATIVE ECHOCARDIOGRAM

Late Mitral Valve Opening in Aortic Regurgitation*

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Austin Flint first described the occurrence of an apical diastolic rumble in patients with severe aortic regurgitation.¹ With the advent of echocardiography, mid and late mitral valve closure have been demonstrated in some patients with this murmur.²,³ The reverse situation, early mitral valve closure with late mitral valve opening, has been described less frequently.

CASE REPORT

A 67-year-old man with luetic aortic regurgitation known for many years had been placed on therapy with digitalis and diuretics a year prior to this presentation because of symptoms of congestive heart failure, mild cardiomegaly, and left ventricular hypertrophy. The brachial artery blood pressure was 140/40 mm Hg, while the popliteal artery pressure was 170/80 mm Hg. A grade 3/6 decrescendo diastolic murmur was heard along the left sternal border, as well as the right sternal border, where it was louder. An apical early and mid-diastolic rumble was also present. Echocardiographic evaluation of the patient's mitral valve (Fig 1) demonstrated marked “fizzing” of the anterior leaflet, which remained relatively closed through most of diastole and finally opened fully with a prominent echocardiographic “a” wave.

DISCUSSION

Botvinick et al⁴ recently studied 11 patients with early mitral valve closure secondary to aortic regurgitation. They described the following two patterns: (1) late diastolic mitral valve closure following the echocardiographic “a” wave but preceding electrical systole; and (2) mid-diastolic closure in patients who did not have an echocardiographic “a” wave. Pridie et al⁵ made the original observation of

![Echocardiogram](image)

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*Fig. 1. Echocardiogram. Anterior mitral valve leaflet (AMV) remains relatively closed throughout diastole and demonstrates marked fluttering consistent with aortic regurgitation. With active atrial contraction, enough left atrial pressure is generated to result in late diastolic opening of mitral valve (A). With premature junctional beats (arrows) and no atrial contraction, the mitral valve “a” wave is absent. F-P wave.*

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CHEST, 70: 1, JULY, 1976
echocardiographic premature mitral valve closure in aortic regurgitation. Numerous reports have documented late diastolic mitral regurgitation and reversed pressure gradient between left ventricular and left atrial end-diastolic pressure as an explanation for this phenomenon.6 Aortic valve fluttering has also been described in cases of aortic regurgitation and apical diastolic rumble.7

In the case reported herein, it is assumed that the mitral valve abnormalities demonstrated by echocardiographic studies were secondary to the direction of the aortic regurgitant jet. That is, the regurgitant jet is directly aimed at the interior mitral valve leaflet, causing it to remain partially closed until finally atrial contraction generates enough atrial pressure to completely open the mitral valve. This echocardiographic abnormality would then be more indicative of the direction of the aortic regurgitant jet than the severity of regurgitation per se, but this remains unproven.

REFERENCES

ANNOUNCEMENTS

Third Annual Seminar in Pulmonary Physiology and Medicine

The Third Annual Seminar in Pulmonary Physiology and Medicine will be held at St. Francis General Hospital, Pittsburgh, September 16 and 17. Contact S. S. Grover, M.D., Director, Pulmonary Division, St. Francis General Hospital, Pittsburgh 15201, for additional information.

14th Annual Seminar in Cardiology

The Rogers Heart Foundation will present the 14th Annual Seminar in Cardiology, September 27-October 1 at the Palmetto Dunes Hyatt Resort Hotel, Hilton Head, South Carolina. For information, contact Ms. Anne S. Criss, Rogers Heart Foundation, St. Anthony’s Hospital, St. Petersburg, Florida 33705.