A notch in time: midventricular hypertrophic cardiomyopathy

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Imaging of a 62-year-old woman with hypertrophic cardiomyopathy revealed mid-septal hypertrophy (22 mm), an apical aneurysm (Panel A), and midventricular obstruction (MVO) with an unusual continuous-wave Doppler (CWD) profile (Panel B). Initially, CWD showed an increase in midventricular systolic velocities to 2.7 m/s (Panels B1 and C1). In midsystole, MVO became sufficiently severe to cause attenuation of distal flow (Panels B2, double headed arrow and C2) in the plane of CWD interrogation coinciding with appearance of a notch (Panel B2, asterisk). However, proximal flow was still present (Panel C2), indicating that MVO was incomplete as opposed to complete where all flow would be absent. Flow just downstream of obstruction converges to the vena contracta, where velocity is highest allowing calculation of peak gradient. Since there was dropout of the jet containing vena contracta velocity, the notch actually represented flow velocities in the neck of obstruction and did not represent midventricular gradients which continued to increase. Dynamic MVO led to a progressive reduction in orifice size, increased afterload, and a corresponding decrease in proximal midventricular flow velocities (Panel B2, asterisk) analogous to the lobster claw abnormality described in left ventricular outflow tract obstruction.1 Partial relief of MVO in late systole permitted the return of distal flow corresponding to the second CWD peak velocity (Panels B3 and C3) and continuing into early diastole (Panels B4 and C4), during which time peak flow velocities now represented midventricular gradients. Simultaneous appearance of apical forward flow and mitral inflow is created by an apex–base gradient that persists into early diastole as a result of high apical pressures and relaxation of the left ventricular basal segments.

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Reference


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