

Letter to the Editor

Subaortic membrane coexisting with systolic anterior motion of the mitral valve



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An asymptomatic 59-year-old male was referred for evaluation of a systolic murmur. Clinical examination confirmed a grade 3/6, harsh midsystolic murmur loudest at the left mid-sternal border, without any change with provocative manoeuvres. Transthoracic echocardiography performed with the Mindray M9system with a SP5-1S transducer (Mindray Bio-Medical Electronics, Shenzhen, China) revealed the presence of a fixed subaortic membrane coexisting with systolic anterior motion of the mitral valve (SAM) (Fig. 1, panels A and B, Movies I and II). The membrane was attached to both the ventricular septum and the anterior mitral leaflet. The left ventricular septal and posterior wall thicknesses were 13 mm and 11 mm at diastolic phase, respectively. The left ventricular cavity dimensions were 4.5 cm in end diastole and 2.5 cm in systole, with a calculated ejection fraction of 81%. The aortic valve was slightly calcified, with a mild central aortic regurgitation and a well preserved opening of the leaflets. Color Doppler echocardiography showed high systolic flow velocity in the left ventricular outflow tract (LVOT); however, it was noted that the increased turbulence began proximal to the aortic valve (Fig. 1, panel C, and Movie III). Pulsed wave Doppler recording of the LVOT showed a mosaic pattern indicative of high subaortic flow velocities. The peak systolic velocity measured by continuous wave Doppler imaging was 3.0 m/s, with a maximum

gradient of 34 mm Hg. Continuous wave Doppler spectrum did not show late peaking appearance but a rounded and symmetrical appearance (Fig. 1, panel D). A diagnosis of discrete subaortic membrane coexisting with SAM was made. Since the patient was asymptomatic and the LVOT obstruction was not severe conservative management was decided.

A subaortic membrane remains a rare and clinically challenging diagnosis in the adult population. It is usually formed by a thin fibrous or occasionally muscular membrane of the LVOT. It may be associated with the presence of other congenital anomalies especially membranous ventricular septal defect that can occur in up to 65% of the cases [1]. Other associated congenital anomalies can include bicuspid aortic valve, coarctation of the aorta, and patent ductus arteriosus. Patients with subaortic membrane can range from asymptomatic to varying degrees of symptoms including dyspnoea at rest or with exertion, palpitations, chest pain or syncope. Its clinical presentation can closely mimic hypertrophic cardiomyopathy with obstructive physiology. A diagnosis requires a heightened suspicion in patients with LVOT obstruction. Making a differential diagnosis of subaortic membrane versus obstructive hypertrophic cardiomyopathy can be difficult [2]. It is critical to make the appropriate diagnosis as the treatment options are vastly different, as well the implications of a diagnosis of hypertrophic cardiomyopathy with regard to risk of sudden death and family screening. Echocardiography is the key technique to demonstrate the anatomical factors and the hemodynamic aspects accounting for LVOT obstruction. Obstructive hypertrophic cardiomyopathy usually associates the subaortic late-peaking high-velocity curve and SAM. The patient reported shows the specific echocardiographic features of a fixed subvalvular membrane causing subaortic stenosis but has in addition typical mitral systolic anterior motion, which is highly specific for hypertrophic subaortic stenosis.

The authors of this manuscript have certified that they comply with the Principles of Ethical Publishing in the International Journal of Cardiology.

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Conflict of interest statement

There is no conflict of interest concerning this manuscript.

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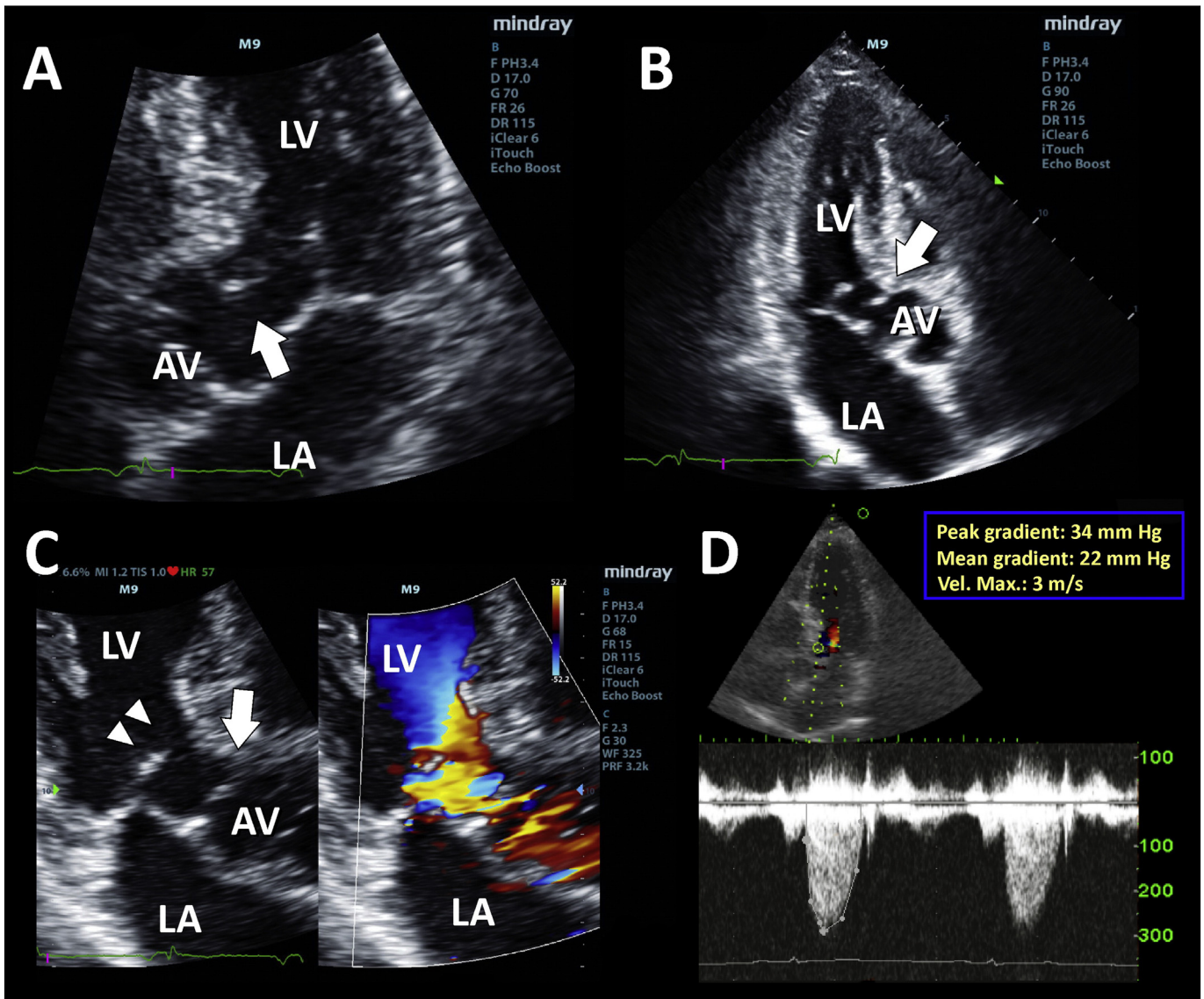


Fig. 1. Panel A: Two-dimensional transthoracic echocardiography using five-chamber view showing the subaortic membrane in the LVOT (arrow). Panel B: Three chamber view showing the subaortic membrane (arrow) and the SAM. Panel C: Echocardiographic images in split-screen mode showing two-dimensional echocardiography and color Doppler simultaneously, zooming into the LVOT in the apical three chamber view, showing turbulence beginning proximal to the aortic valve. Panel D: Continuous wave Doppler spectrum showing not late peaking appearance but symmetrical appearance and the velocity was increased up to 3 m/s at the LVOT. LA indicates left atrium; LV, left ventricle; AV, aortic valve.

References

- [1] D. Kitchiner, M. Jackson, N. Malaiya, K. Walsh, I. Peart, R. Arnold, et al., Morphology of left ventricular outflow tract structures in patients with subaortic stenosis and a ventricular septal defect, *Br. Heart J.* 72 (1994) 251–260.
- [2] C.J. Bruce, R.A. Nishimura, A.J. Tajik, H.V. Schaff, G.K. Danielson, Fixed left ventricular outflow tract obstruction in presumed hypertrophic obstructive cardiomyopathy: implications for therapy, *Ann. Thorac. Surg.* 68 (1999) 100–104.