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Hypertrophic Cardiomyopathy Associated with Mid-Cavity Obstruction

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Case report

A 36 years old male presented with complaints of chest pain and palpitation for 5-7 days. He had similar complaints intermittently since last one year. He was examined in outdoor and his blood pressure was found as 172/96 mmHg with heart rate of 116 per minute. His ECG was done, which revealed ST segment depression in leads II, III, AVf, V5-V6 and peaking of T wave in V2 to V4 (Figure 1).

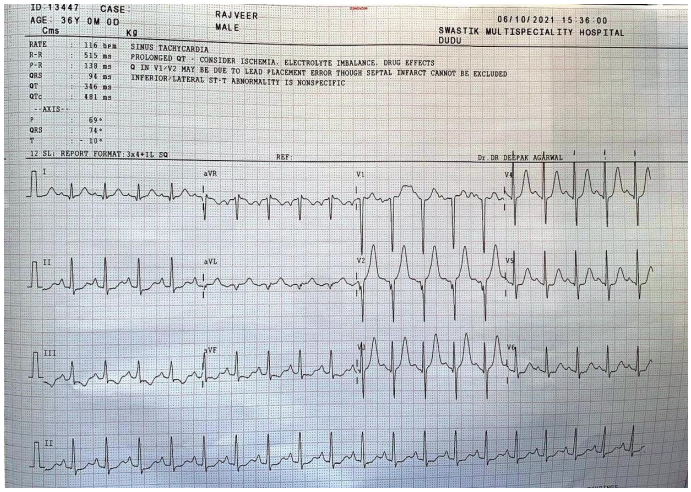

Figure 1: ECG of patient showing ST segment depression in leads II, III, AVf, V5-V6 and peaking of T wave in V2 to V4.

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A two-dimensional transthoracic echocardiogram was performed in the usual manner with a Vivid T8 General Electric (Milwaukee, Wisconsin, USA) ultrasound system and a 3 MHz transducer. It showed situs solitus of the atria, atrioventricular concordance, D loop ventricles and ventriculo-arterial concordance. Cross-sectional echocardiography from apical four-chamber view, during diastole presented hypertrophy of the left ventricle walls, especially interventricular septum (Figure 2, Video 1).

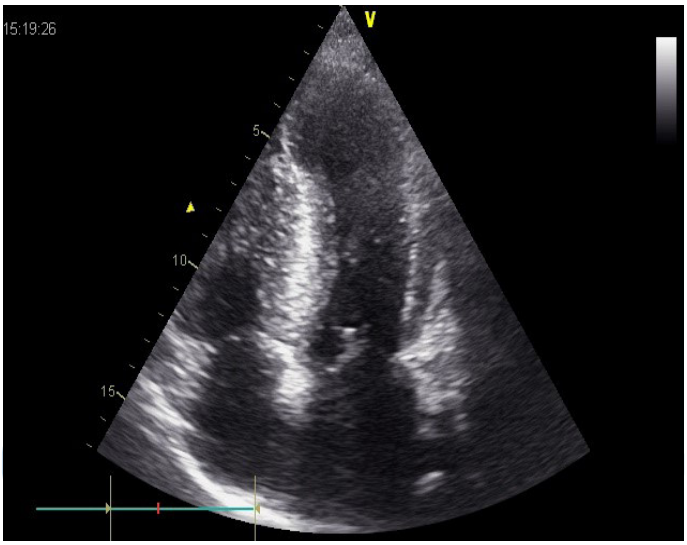

Figure 2: Apical four-chamber view, during diastole presented hypertrophy of the left ventricle walls, especially interventricular septum.

During the systole left ventricular walls form obstruction at the middle level of the left ventricle, causing two "separate chambers" where apical part actively participates during the contraction. Parasternal long axis view also confirmed about significant left ventricular hypertrophy (Figure 3, Video 2).

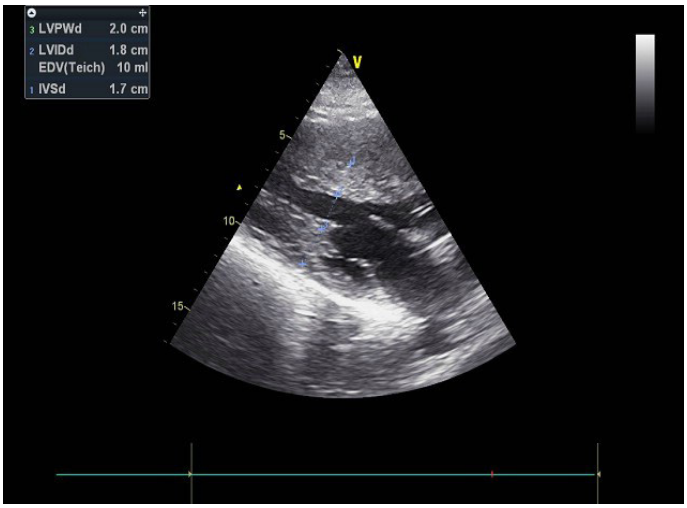

Figure 3: Parasternal long axis view, during diastole presented hypertrophy of the left ventricular walls.

The Color flow Doppler imaging shows a very narrow and constricted area at the middle ventricle level in systole (Figure 4, Video 3 & 4) whereas continuous Doppler imaging presented a high systolic velocity with the peak gradient of 115 mmHg (Figure 5).

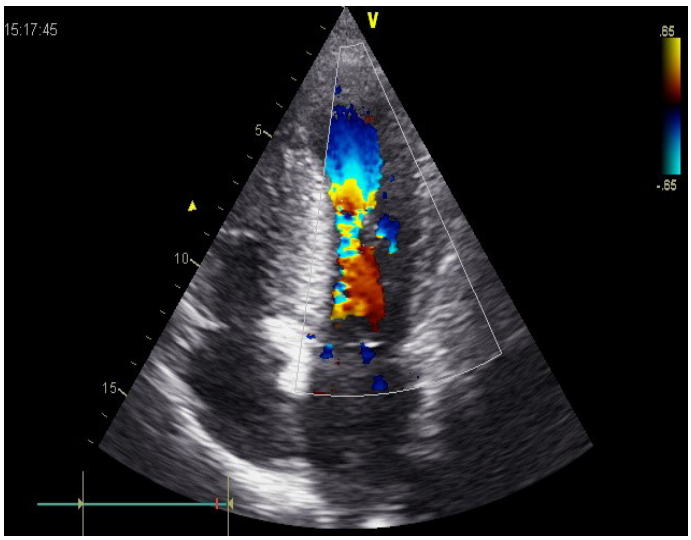

Figure 4: Apical four chamber view, Color flow Doppler imaging showing a very narrow and constricted area at the middle ventricle level in systole.

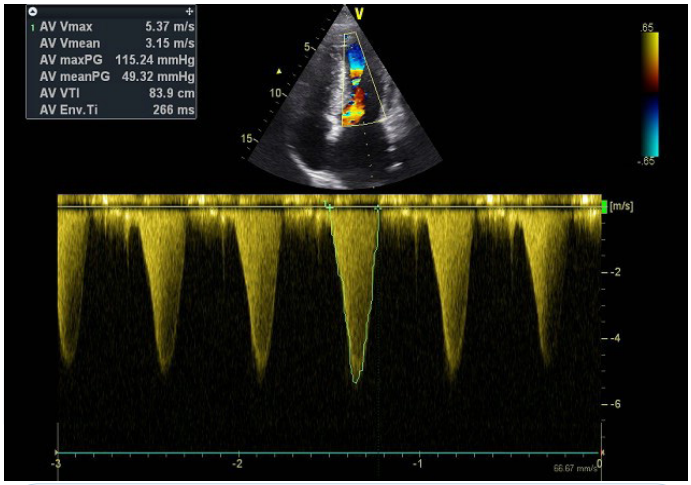

Figure 5: Apical four-chamber view, continuous width Doppler imaging presenting a high systolic velocity with the peak gradient of 115 mmHg.

There was no significant obstruction at aortic valve level which was confirmed by pulsed wave doppler and pressure gradient at aortic valve level was found to be 14 mmHg (Figure 6).

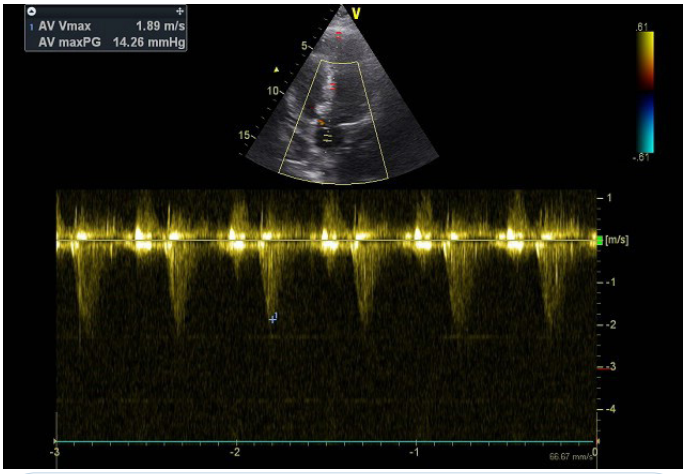

Figure 6: Apical five-chamber view, pulsed wave Doppler showing insignificant pressure gradient at aortic valve level.

On the basis of echocardiographic findings diagnosis of Hypertrophic Cardiomyopathy associated with mid-cavity obstruction and high left intraventricular pressure was made and he was started on beta-blocker therapy.

In our patient, an atypical form of hypertrophic cardiomyopathy is presented with mid-cavitary obstruction of left ventricle and significantly raised intracavitary pressure. This form involves selective hypertrophy and obstruction at the mid-left ventricular level. Treatment of midventricular HCM is targeted at reducing the symptoms, such as the intraventricular gradient, and the risk of complications, such as heart failure and sudden cardiac death. Beta-blockers and calcium blockers can contribute to reduction of obstructive gradients with negative inotropic effect, decreasing outflow obstruction and restoring cardiac output. Septal myectomy, through resection of a portion of the septum, can achieve a similar effect by widening the outflow tract if concomitant outflow obstruction is present but may not be applicable to the midventricular variant.