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Provocation of left ventricularoutflow tract obstruction usingnitrate inhalation in hypertrophiccardiomyopathy: Relation toelectromechanical delay

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ABSTRACT

Background: Left ventricular outflow tract obstruction (LVOT) is an independent predictor of adverse outcome in hypertrophic cardiomyopathy (HCM). It is of major importance that the provocation modalities used are validated against each other.

Aim: To define the magnitude of LVOT gradients provocation during both isosorbide dinitrate (ISDN) inhalation and treadmill exercise in non-obstructive HCM and analyze the correlation to the electromechanical delay using speckle tracking.

Methods: We studied 39 HCM pts (64% males, mean age 38 ^ 13 years) regional LV longitudinal strain and electromechanical delay (TTP) was analyzed at rest using speckle tracking. LVOT gradient was measured at rest and after ISDN then patients underwent a treadmill exercise echocardiography (EE) and LVOT gradient was measured at peak exercise.

Results: The maximum effect of ISDN on LVOT gradient was obtained at 5 minutes, it increased to a significant level in 12 (31%) patients, and in 14 (36%) patients using EE, with 85.6% sensitivity & 100% specificity. Patients with latent obstruction had larger left atrial volume and lower E/A ratio compared to the non-obstructive group (p , 0.01). LVOTG using ISDN was significantly correlated with that using EE (p , 0.0001), resting LVOTG (p , 0.0001), SAM (p , 0.0001), EF% (p , 0.02) and regional electromechanical delay but not related to global LV longitudinal strain. Using multivariate regression, resting LVOTG (p ¼ 0.006) & TTP mid septum (p ¼ 0.01) were found to be independent predictors of latent LVOT obstruction using ISDN.

Conclusion: There is a comparable diagnostic value of nitrate inhalation to exercise testing in provocation of LVOT obstruction in HCM. Latent obstruction is predominantly dependent on regional electromechanical delay.

Keywords: LVOT obstruction provocation, electromechanical delay, hypertrophic cardiomyopathy

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