Assessment of Left Ventricular Mechanics Before And After Surgical Myectomy in Patients With Hypertrophic Obstructive Cardiomyopathy, Using Two-Dimension Speckle Tracking Echocardiography

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ABSTRACT

OBJECTIVES: To detect changes in Left ventricular mechanics after surgical myectomy in patient with hypertrophic obstructive cardiomyopathy.

BACKGROUND: Septal myectomy is the gold standard method to relieve LVOT PG in patients with HOCM. Myocardial mechanics are abnormal in those patients, demonstrating low longitudinal strain, high circumferential strain, and high apical rotation compared with healthy subjects. The aim of this study was to determine whether functional improvement after myectomy is associated with improved myocardial mechanics.

METHODS: A total of 15 patients (60% males and 40% female). with HOCM refractory to medical treatment were subjected to septal myectomy, Clinical data and paired echocardiographic studies before and within 6monthes after myectomy were analyzed and compared. Myocardial mechanics including longitudinal and circumferential strain and rotation and LV synchronization were assessed using two-dimensional strain software (Velocity Vector Imaging).

RESULTS: Significant symptomatic relieve, left ventricular outflow gradient decreased dramatically (from 63.13 ± 10.25 to 9.96 ± 2.72mmHg; P < .0001), and left atrial volume index decreased (from 37.8 ± 5.61 to 26.38 ± 3.37 cm3/m2; P < .05). E/e′ decreased from (15.23 ± 2.39 to 9.18 ± 1.42; P < 0.05), Low longitudinal strain decreased at the myectomy site (basal septum), increased in the basal inferior segment, and remained unchanged globally (-6.43 ± 6.54 to -8.70 ± 2.30; P 0.232). High circumferential strain decreased (from -28.47± 3.35 to -18.26 ± 2.86, P < .05). High left ventricular twist normalized (from 16.52 ± 2.25 to 14.02 ± 2.27, P < .05).

CONCLUSION: Surgical myectomy alleviated symptoms, relieved obstruction, and decreased left atrial volume index. Longitudinal strain remained unchanged, but circumferential strain and rotation decreased, demonstrating different mechanical adaptations to chronic elevated afterload seen in patients with severe aortic stenosis undergoing valve replacement, Improvement of the predictors of diastolic function seem to be related to symptomatic response to myectomy.

KEY WORDS: Hypertrophic obstructive cardiomyopathy (HOCM), Left ventricular outflow tract obstruction (LVOTO), Septal myectomy, Speckle tracking.