

 **CARDIAC FUNCTION AND HEART FAILURE****SLOWED VENTRICULAR UNTWISTING IS RELATED TO DECREASED ELASTIC RECOIL BUT NOT TO INCREASED MYOCARDIAL FIBROSIS IN HYPERTROPHIC CARDIOMYOPATHY**

ACC Poster Contributions

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Background: LV untwisting is the dominant deformation during relaxation and likely links with LV systolic behavior. Hypertrophic cardiomyopathy (HCM) is a phenotypic manifestation of a complex process that includes inappropriate myocyte hypertrophy, disarray, and patchy fibrosis of the ventricle. It is known that HCM patients have multiple areas of patchy myocardial fibrosis, as seen in the delayed enhancement magnetic resonance imaging (DE-MRI). Thus, we analyzed the interrelation among LV twisting, untwisting and LV fibrosis in patients with HCM.

Methods: DE-MRI and echo studies were performed in 10 patients with HCM in whom any medication had not been previously given. %DEmass was determined as an MRI index of the extent of myocardial fibrosis by dividing the extent of late gadolinium enhancement by LV mass. We acquired basal and apical short-axis LV images for off-line speckle tracking imaging analysis. LV twisting was defined as the difference of LV apical rotation relative to the base, and this was determined at the endocardium and epicardium, respectively. LV untwisting index was defined as the time constant of LV untwisting decay. These echo parameters were also obtained in 10 healthy controls.

Results: (1) LV twisting was similar between HCM patients and controls; however, LV untwisting was slowed in HCM patients compared with controls (endocardium 235 ± 22 vs. 128 ± 20 msec, $p < 0.01$, epicardium 206 ± 29 vs. 127 ± 14 msec, $p < 0.05$). (2) There was a significant correlation between %DEmass and LV twisting at the endocardium ($r = -0.67$, $p < 0.05$). In contrast, %DEmass did not correlate with LV untwisting index at the endocardium or at the epicardium. (3) LV untwisting index at the epicardium correlated with LV end systolic volume (LVESV) ($r = 0.71$, $p < 0.05$) and with LV mass index (LVMI) ($r = 0.43$, $p = 0.06$), while LV twisting did not correlate with LVESV or with LVMI ($r = 0.19$, $r = 0.02$).

Conclusions: HCM may be characterized by constant twisting and slowed untwisting of the ventricle. Twisting is impaired in those with extensive myocardial fibrosis, and slowed LV untwisting is not related with myocardial fibrosis, but may be related to decreased elastic recoil as well as slowed active relaxation of the myocardium.