Reduced Global Longitudinal Strain in Apical (‘Takotsubo’) Stress Cardiomyopathy: Implications for Diastolic Filling and Assessment of Filling Pressures by E/e’ Ratio

Poster Contributions
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Background: Severe elevation in filling pressures is common among patients with stress cardiomyopathy (SCM), regardless of whether it is the apical (‘Takotsubo’ -T-SCM) or apical sparing (‘reverse Takotsubo’-rT-SCM) phenotype. Moreover, E/e’ reliably predicts LVEDP in T-SCM, but underestimates LVEDP in pts with rT-SCM. We hypothesized that the unreliability of E/e’ in rT-SCM might be related to less global myocardial dysfunction in rT-SCM and that such differences in global dysfunction would be reflected by global longitudinal strain (GLS, %).

Methods: We identified 37 pts with T-SCM and 16 pts rT-SCM. All underwent 2D echocardiography within 48 hours of invasive measurement of LVEDP; speckle tracing strain imaging was performed offline. GLS was calculated from apical 2-, 3-, and 4-chamber views.

Results: GLS was significantly impaired in T-SCM, but only mildly reduced in rT-SCM (-10.43 ± 3.28 % vs. -16.17 ± 2.86 %, p < 0.001). GLS directly correlated with E/e’ in both T-SCM and rT-SCM in both individual analysis and when analyzed in combination (r = 0.627, p <0.0001). Our Results: 1. confirm that E/e’ accurately predicted LVEDP in T-SCM, but correlates poorly with LVEDP in rT-SCM and demonstrate that 2. GLS directly correlates with E/e’ in both T-SCM and rT-SCM; and 3.GLs is significantly impaired in T-SCM.

Conclusion: We conclude that preserved longitudinal strain in rT-SCM leads to a ‘falsely’ preserved e’ and thus explains the underestimation of LVEDP by E/e’ in rT-SCM.