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Imaging

PREVALENCE AND CLINICAL AND ECHOCARDIOGRAPHIC PREDICTORS OF DELAYED HYPER-ENHANCEMENT IN SEVERE AORTIC STENOSIS

ACC Moderated Poster Contributions

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Background: Severe aortic stenosis (AS) causes myocardial fibrosis (MF), which is represented by delayed hyperenhancement (DHE) in magnetic resonance imaging (MRI), and the amount of MF is strongly related with outcome after aortic valve replacement (AVR). However, there are technological, physical and safety limitations inhibiting routine use of MRI to detect DHE. We investigated the prevalence, and clinical and echocardiographic predictors of DHE in MRI of patients with severe aortic stenosis.

Methods: We analyzed 35 patients (15 males, 64 ± 10 years) to undergo AVR due to severe AS and to be examined by transthoracic echocardiography (TTE) and cardiac MRI prior to AVR. On the analysis of DHE in MRI and TTE, left ventricle (LV) was divided by 16 segment LV model. The basal and mid-ventricular slices are equally divided into six segments each while the apical slice is divided into four equal segments. The amount of DHE was represented by absolute area and percent ratio per every segment area.

Results: DHE in MRI was observed in 31 % (11/35)(5 males, 46%). 9 of 11 patients did not have a history of CAD. DHE in MRI was mainly located in mid level of LV (11 patients, 100%), and apex (54.5%), basal level (54.5%) showed similar prevalence. And on short axis, DHE mainly located in inferior (81.8%), inferoseptal segment (72.7%) and posterolateral (54.5%). Patients with DHE showed thicker inter-ventricular septum (diastole: 13.8 ± 3.0 mm vs. 11.8 ± 2.3 mm, $p=0.04$; systole: 16.6 ± 2.8 mm vs. 14.4 ± 2.5 mm, $p=0.025$), posterior wall thickness (diastole: 13.8 ± 2.5 mm vs. 11.5 ± 1.6 mm, $p=0.002$; systole: 16.7 ± 2.5 mm vs. 15.1 ± 2.2 mm, $p=0.063$). On tissue Doppler, patients with DHE had lower S' (4.12 ± 1.15 vs. 5.1 ± 1.27 , $p=0.045$), E' (3.39 ± 0.90 vs. 4.84 ± 1.53 , $p=0.007$) and A' (6.36 ± 1.83 vs. 7.6 ± 1.34 , $p=0.04$) of mitral annulus than those without DHE. In multivariate regression analysis, E' was independent predictive value (OR=0.330, 95% CI:0.123~0.882, $p=0.027$) to represent DHE in MRI of patient with severe AS.

Conclusions: DHE of cardiac MRI in patients with severe AS is frequently noted, and hypertrophy of LV septum and posterior wall, and decreased early diastolic mitral annular velocity is related with DHE on cardiac MRI.