

GW23-e1325

ASSESSMENT OF LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENTS WITH MULTI-VESSEL CORONARY ARTERY DISEASE AND NORMAL WALL MOTION BY TWO-DIMENSIONAL SPECKLE TRACKING IMAGING

doi:10.1136/heartjnl-2012-302920ad.13

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Objectives We sought to evaluate myocardial systolic function in patients with multi-vessel coronary artery disease and normal wall motion by two-dimensional speckle tracking imaging.

Methods Forty-five patients with multi-vessel coronary artery and normal wall motion (MVD) were enrolled into this study and 36 subjects have low risk of coronary artery disease as control group. MVD group were divided into CCC-MVD group and N-MVD group according to the presence or absence of coronary collateral; LCA-MVD group and RCA-MVD group according to the position of coronary atherosclerosis mainly involved. The two-dimensional loop-cines were obtained in apical 2-chamber view, apical 4-chamber view and apical the long axis view of left ventricle, and three levels of short axis views (mitral valve, papillary muscle and cardiac apex). Left ventricular wall was divided into 18 segments by Q-analysis software, longitudinal, radial and circumferential systolic strain and global longitudinal strain (GLS) were analysed, calculated the average of radial and circumferential systolic strain of 18 segments as global radial and circumferential strain (GRS and GCS), and the average of longitudinal, radial and circumferential systolic strain of basic, middle and apex levels (Bas-GLS, Mid-GLS, Ap-GLS, Bas-GCS, Mid-GCS, Ap-GCS, Bas-GRS, Mid-GRS, Ap-GRS).

Results The conventional echocardiography parameters of left ventricular systolic and diastolic function were similar between multi-vessel CAD with normal wall motion and control group. GLS, GRS, Bas-GLS, Bas-GCS, Bas-GRS, Mid-GLS, Mid-GCS were lower in MVD than in control group. Compared to control group, GLS, Bas-GLS, Bas-GCS, Mid-GLS were decreased both in N-MVD group and CCC-MVD group, while Mid-GCS was just decreased in N-MVD group; compared with control group, LCA-MVD group had lower GLS, Bas-GLS, Mid-GLS, Bas-GCS and Mid-GCS, and RCA-MVD group had lower Bas-GLS, Bas-GCS, Bas-GRS. Meanwhile, RCA-MVD group had higher Mid- and Ap- strain than LCA-MVD, especially Ap-GCS, which was significantly higher than control group. The best cut-off value was determined as -22.27% for Mid-GCS, giving a maximum sum of specificity (62.9%) and sensitivity (85.7%), a minimal sum (51.4%) of the misdiagnosis and Missed diagnosis rate.

Conclusions Myocardium systolic function were impaired in MVD patient, especially basal systolic function and Longitudinal systolic function, though they had normal wall motion at rest; systolic function were lower in atherosclerosis lesion mainly involved LCA than mainly involved RCA; apical systolic function and Mid-GCS were improved in CCC-MVD group than in N-MVD group.