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Imaging

THE ABILITY OF THE RADIUS OF PROXIMAL ISOVELOCITY SURFACE AREA TO ASSESS THE ANATOMIC AND HEMODYNAMIC SEVERITY OF MITRAL STENOSIS AFTER FIXING ALIASING VELOCITY

Poster Contributions
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Background: Proximal isovelocity surface area (PISA) has emerged as an accurate method for assessment of mitral valve area (MVA) in patients with mitral stenosis (MS).

Aim: Test the hypothesis that PISA radius (PISA-r) can be used to assess MS if aliasing velocity (Val) is set to a constant.

Methods: 70 consecutive patients were recruited. Complete echocardiographic assessment of MS was done. MVA was calculated by 2-D planimetry (PLN) and PISA, after fixing the valve angle to 100 degrees and Val to 33 cm/second, leaving only PISA-r and maximal mitral early diastolic velocity (Vmax) to be measured. In addition, 11 patients underwent balloon mitral valvuloplasty (BMV). In those patients, left atrial pressure (LAP) was invasively measured before BMV. The ratio between isovolumic relaxation time (IVRT) to time difference between the onset of mitral flow E-wave (T-E) and time to onset of mitral annular early diastolic velocity (T-e') or the ratio IVRT/Te'-E, was. Both IVRT/Te'-E and PISA-r were compared for correlation with LAP.

Results: Mean age was 44.1±17.9 years, 39(56%) patients were females, and 26(37%) were Af. PISA and PLN correlated significantly (r=0.966; p<0.001). Interestingly, PISA-r showed a stronger correlation with PLN than Vmax (r=0.795, 0.446, p<0.001; respectively). Patients were then classified according to MS severity by PLN. PISA radius was found by ANOVA-test to decreased significantly as the severity of MS increase. ROC-curve revealed that PISA-r of 1.35 and 1.65 cm could effectively differentiate mild from moderate and moderate from severe MS, respectively with excellent sensitivities and specificities. In the subset of patients who underwent BMV, the ratio IVRT/Te'-E correlated with LAP before BMV (r=0.74, p=0.009), however, PISA-r correlated also strongly with LAP (r=0.806, p=0.003), and was proven to be better than IVRT/Te'-E by multivariate regression analysis

Conclusions: Provided that Val is set to a constant of 33 cm/s, PISA radius can effectively assess anatomic and hemodynamic severity of MS. Our study suggests PISA radius as a simple alternative to the tedious IVRT/Te'-E, for estimation of LAP in those patients.