Impact of Left Anterior Descending Artery Wrapping Around the Left Ventricular Apex on Cardiac Mechanics in Patients with Normal Coronary Angiography

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BACKGROUND

The anatomic features of left anterior descending (LAD) coronary artery have important clinical significance. An LAD that wraps around the LV apex theoretically supplies a greater amount of myocardium than one that ends at or before the apex.

OBJECTIVE

We examined the impact of LAD wrapping on left ventricular longitudinal and circumferential and twist mechanics in patients with normal coronary angiography.

MATERIALS AND METHODS

71 patients with evidence of normal coronary angiography (Wrapped LAD: n=52,73%) and non wrapped LAD(n=19, 27%) were included in the study. We compared LV longitudinal and circumferential(CS) strain(εsys), systolic strain rate(SRsys) early and late diastolic SR (SRe& SRa), LV electromechanical dyssynchrony (TTP-SD) in addition to LV twist and torsion using speckle tracking echocardiography between groups.

RESULTS

No significant difference in age, gender or BSA or EF% between the two groups. LAD wrapped group showed higher LVMI, deceleration time (DT), (P<.0001) global longitudinal SRa (P<.02), CS SRa at the basal segments (P<.02), CS SRsys & SRe and SRa (P<.0001) at the apical segments and apical rotation of septal & anterior segments compared with non wrapped group. LV twist was correlated negatively with LV TTP-SD (r=.25, P<.03), and positively with long. εsys (r=.47, P<.0001), CS εsys (r=.55, P<.0001), CS SRsys (r=.23, P<.05), CS SRe (r=.55,
P<.0001). Using multivariate regression analysis LVMI: OR .922 CI: .860-.990, P<.03, DT; OR: .932, CI: .877-.991, P<.02 and CS SRa at atrial diastole; OR: .000,
CI: .000-.271, P<.03, were independent predictors of LAD wrapping around LV apex.

CONCLUSION

Wrapped LAD is associated with better myocardial relaxation and rotational mechanics in patients with normal coronary angiography. This could explain the worse prognosis in such population when LAD occlusion acutely emerges.