

Coronary Calcium Score, Shape and Size Matter

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Cardiac CT has been widely used for detection and quantification of Coronary Artery Calcium (CAC) using Agatston score [1,2]. Total CAC score has been conspicuously validated as a marker for cardiovascular risk; however the degree of luminal narrowing is only weakly correlated with the amount of calcification [3].

Specificity of CAC scoring for obstructive disease could be improved by differentiating specific morphological patterns of calcification, Shell-like and diffuse were associated with more severe stenosis and more non-calcified plaque components than nodular pattern [4,5]. It has been established that non-calcified and mixed plaques are more rupture-prone, therefore, more efforts focus on early identification of patients with “vulnerable” lesions for sake of primary prevention [6-9].

Using IVUS, an association was observed between acute myocardial infarction and spotty calcified deposits within an arc of $\leq 90^\circ$ in culprit lesions [10]. In 2007, Motoyama et al. [11,12] introduced the term “spotty calcification”, defined as <3 mm, to MDCT studies. Studies have shown the prevalence of spotty calcification in acute coronary syndrome (ACS) culprit lesions to be triple that instable angina lesions (63 vs. 21%), on the other hand, in asymptomatic subjects with identified vulnerable plaques, presence of spotty calcification in those who developed ACS was more frequent than in those who remained asymptomatic (27 vs. 13%).

Dual-energy CTA studies may enhance calcium detection and potentially obviate the need for dedicated CAC score studies [13].

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