ASSSESSMENT OF NONCULPRIT VULNERABLE PLAQUE WITH CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY IN COMPARISON TO INTRAVASCULAR ULTRASOUND

Poster Contributions
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Background: The composition of atherosclerotic plaque has an important influence on the risk of future coronary events. Plaque with attenuation on intravascular ultrasound (IVUS) might be related to a worse long-term outcome of coronary artery disease (CAD), while coronary computed tomography angiography (CTA) is the most reliable noninvasive method of evaluating plaque composition. This study aimed to compare detection of attenuated plaques at nonculprit lesions between coronary CTA and IVUS, and to clarify the relations between plaque vulnerability and risk factors for CAD.

Methods: We performed coronary CTA in 108 consecutive patients with suspected coronary artery disease, among who 82 underwent coronary angiography and percutaneous coronary intervention. In these 82 patients, 210 plaques were evaluated by both coronary CTA and IVUS.

Results: Fifty-nine plaques (47 calcified and 12 mixed plaques) were excluded from analysis. The remaining 151 plaques comprised 50 soft plaques, 51 attenuated plaques, and 50 fibrous plaques. Attenuated plaques had a significantly higher CT density than soft plaques (P<0.001) and a significantly lower CT density than fibrous plaques (P<0.001). Microcalcification and lipid pool-like changes were more frequent in attenuated plaques than in soft plaques (P<0.05). Patients with attenuated plaques had significantly lower levels of high-density lipoprotein cholesterol than those without attenuated plaques (P<0.001). On multivariate analysis, significant independent predictors of attenuated plaque were low high density lipoprotein-cholesterol (odds ratio: 0.87, 95% confidence interval: 0.81 to 0.92, P<0.001) and microcalcification combined with lipid pool-like changes (4.53, 1.66 to 12.3, P=0.003).

Conclusions: Analysis of nonculprit lesions by coronary CTA is useful for detecting vulnerable plaque associated with an increased risk of future coronary events.