Abstract 20

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Title: The Analysis of Coronary Artery Plaque Composition by Virtual Histology Intravascular Ultrasound Depending on Augmentation index

Background:
Many studies have analyzed augmentation index (Alx) to predict the severity of coronary artery disease (CAD). And, several studies have investigated the relationship between body mass index (BMI) and coronary artery calcification. However, most of them were not conducted by Virtual Histology Intravascular Ultrasound (VH-IVUS). Therefore, the purposes of this study are 1) to assess the relationship between Alx and findings of VH-IVUS, and 2) to investigate the relationship between coronary artery plaque composition by VH-IVUS and BMI.

Methods:
This is a prospectively observational study. The authors enrolled 20 patients undergoing coronary angiography (CAG) from Jan. to Mar. 2013. When >50% stenosis was observed in CAG by quantitative coronary angiography (QCA), VH-IVUS was performed. On the basis of minimal lumen area (MLA) (<4.0mm2) by IVUS, we divided them into PCI and non-PCI groups. We analyzed the waveform of central aortic pressure using SphygmoCor® on the verge of CAG.

Results:
13 patients (65.0%) were underwent the PCI. Heart rate-adjusted Alx (Alx@75) was significantly higher (31.46±6.49% vs. 18.57±8.36, p=0.002) in PCI group. MLA and Alx@75 was significantly inversely correlated (ρ=-0.559, p=0.010). Plaque volume and Alx@75 tended to be correlated (ρ = 0.437, p = 0.055), but showed a statistically insignificant and similar trend between dense calcium volume composition and Alx@75 (p=0.418, p=0.067). Dense calcium volume composition and BMI were significantly inversely correlated (ρ=-0.569, p=0.009).

Conclusion:
A high Alx@75 indicates more calcified plaque, greater plaque volume and smaller MLA. A low BMI indicates more calcified plaque in significant CAD.