



COMPARISON OF CORONARY CALCIFICATION DETECTION BETWEEN MULTI-DETECTOR COMPUTED TOMOGRAPHY AND OPTICAL COHERENCE TOMOGRAPHY

Poster Contributions
Poster Hall, Hall C
Friday, March 17, 2017, 3:45 p.m.-4:30 p.m.

Session Title: Interventional Cardiology: Angiography, Intravascular Imaging and Interventional CT/MR
Abstract Category: 16. Interventional Cardiology: Angiography and Interventional CT/MR
Presentation Number: 1153-117

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Background: Coronary artery calcification can be detected by both non-invasive and invasive imaging modalities. In the present study, we compared the coronary calcium detection between multi-detector computed tomography (MDCT) and optical coherence tomography (OCT).

Methods: Consecutive 47 coronary vessel segments from 43 pts with both OCT and MDCT within 3 months were evaluated retrospectively. The OCT quantitative analysis included calcium angle, maximal calcium thickness, total calcium length, which were further subcategorized based on calcium thickness (≤ 0.5 mm, 0.5-1.0mm, ≥ 1.0 mm). Calcium Volume Index (=mean calcium angle \times calcium length) were calculated. The amount of coronary calcification by MDCT was assessed by Agatston Score and Volume Score using coronary calcium score imaging.

Results: Vessel segments were divided into 5 groups according to Agatston Score: Negative (0), Minimal (1-9), Mild (10-99), Moderate (100-399) and Severe (≥ 400). Out of 12 Agatston Score negative vessel segments, 75% (9/12) segments demonstrated calcium deposit by OCT with thickness < 1.0 mm. However, all Agatston Score positive segments ($n=35$) got positive Calcium Volume Index by OCT. Out of 13 Minimal/Mild Agatston Score segments, only 23% (3/13) segments had calcium thickness ≥ 1.0 mm. Overall, both Agatston Score and Volume Score showed significant correlation with Calcium Volume Index by OCT (Agatston Score, $r=0.84$, $p<0.01$; Volume Score, $r=0.83$, $p<0.01$, respectively). When Agatston Score were compared among the different calcium thickness (≤ 0.5 mm, 0.5-1.0mm, ≥ 1.0 mm), Calcium Volume Index of thickness of 0.5-1.0mm demonstrated a better correlation with Agatston Score (≤ 0.5 mm, $r=0.48$, $p<0.01$; 0.5-1.0mm, $r=0.87$, $p<0.01$; ≥ 1.0 mm, $r=0.70$, $p<0.01$, respectively).

Conclusions: OCT has a better sensitivity for detecting coronary artery calcification than MDCT. Both Agatston Score and Volume Score are well correlated to Calcium Volume Index by OCT, especially when calcium thickness is ≥ 0.5 mm.