Body Mass Index is a Positive Determinant of Carotid Plaque Stabilization During Statin Therapy Assessed by MRI
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Background: Carotid plaque volume and composition have high predictive value of cardiovascular coronary events. High-resolution magnetic resonance imaging (MRI) is a noninvasive imaging modality that enables the quantitative and compositional assessment of the carotid artery. To date, little is known regarding an effect of intensive lipid lowering therapy on carotid plaque characteristics. The purpose of the present study was to evaluate clinical factors that have an impact on plaque change using statin therapy.

Methods: Prospective, open-label blinded endpoints trial was performed using 1.5-T MRI to image carotid atherosclerotic plaques. Patients with maximum carotid intima-media thickness (IMT) >1.8 mm as measured by ultrasound and a plasma LDL-C of more than 120 mg/dL without statin treatment were enrolled from 2007 to 2010. All patients were administrated by rosuvastatin 5mg/day after baseline MRI. MRI was performed at baseline and 24-month of follow-up. The endpoint was the change of % necrotic core (p<0.0002).

Results: After 24 months, 38 patients had taken MRI scans to compare by reviewers blinded to clinical data, and temporal sequence of scans. LDL-C was significantly reduced from baseline by 46.6%. At 24 months, there was a significant decrease in the ratio of necrotic core and vessel volume, whereas plaque volume was no significant change. We found a linear association between the change of necrotic core and baseline body mass index (BMI). Analysis of covariance revealed that baseline BMI influenced the change of % necrotic core (p=0.0002).

Conclusions: The greater degree of carotid plaque stabilization was found according to the increase of baseline BMI after 24-month rosuvastatin treatment.
Conclusion: Compared to IVUS, PI OCT imaging of the stented segment used automated pullback. Image sets were screened by the core lab, and those determined to be adequate quality were then reviewed by PI’s from both academic and non-academic practices. The PI’s assessed stent expansion and symmetry, reference vessel and in-stent cross-sectional area (CSA) and diameter, and stent strut apposition. Their image interpretations were then compared to core lab readings and examined for inter-observer variability.

Methods: Following stent placement in consecutive patients meeting inclusion criteria, we performed both OCT and IVUS imaging of the stented segment using automated pullbacks. Image sets were screened by the core lab, and those determined to be adequate quality were then reviewed by PI’s from both academic and non-academic practices. The PI’s assessed stent expansion and symmetry, reference vessel and in-stent cross-sectional area (CSA) and diameter, and stent strut apposition. Their image interpretations were then compared to core lab readings and examined for inter-observer variability.

Results: OCT and IVUS image sets (n=5) were reviewed by PI’s (n=11). Variation in the deviation from core lab measurement of in-stent CSA for IVUS was 1.48 mm² compared with 0.87 mm² for OCT (p=0.022); for measurement of average reference vessel CSA this variability using IVUS was 2.31 mm² compared with 0.85 mm² for OCT (p=0.024); and less deviation from core lab readings in the assessment of deployed coronary stents.

Conclusion: Compared to IVUS, PI’s interpretation of OCT images have less variation and more closely reflect core lab evaluation.

Stent Optimization Following Music Criteria Comparing Optical Coherence Tomography vs Intravascular Ultrasound: The OCTIVUS Study

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Background: IVUS guided stent deployment using validated criteria (MUSIC) has been shown to improve outcomes. However, for the practicing interventionalist (PI) without core lab support, the utility of IVUS is often limited by difficulty interpreting images. Optical Coherence Tomography (OCT) is a new intra-coronary imaging modality, which yields higher image resolution compared with IVUS. However, the consistency and accuracy with which PI’s interpret OCT images has not been fully evaluated or compared with IVUS.

Hypothesis: We hypothesized that, compared with IVUS, PI’s experienced with both imaging techniques would interpret OCT images with less deviation from core lab readings and would more reliably assess the MUSIC criteria.

Methods: Following stent placement in 5 consecutive patients meeting inclusion criteria, OCT and IVUS images of the stented segment using automated pullbacks were obtained. Image sets were screened by the core lab, and those determined to be adequate quality were then reviewed by 11 PI’s from both academic and non-academic practices. The PI’s assessed stent expansion and symmetry, reference vessel and in-stent cross-sectional area (CSA) and diameter, and stent strut apposition. Their interpretations were (pairwise) compared for inter-observer agreement. For each pair of PI’s, we calculated the % agreement with IVUS and OCT. We also calculated the % agreement of each PI with the corelab.

Results: The inter-observer agreement for obtaining the MUSIC criteria using IVUS was 80.4% compared to 81.1% using OCT (p=0.78). Using the corelab as a reference, the PI’s obtained an agreement of 72.7% using IVUS vs. 67.3% using OCT (p=0.43). Despite differences in the individual components of the MUSIC criteria between techniques and between PI’s and corelab, they did not affect the overall results.

Conclusion: Although MUSIC criteria was previously validated with IVUS, OCT provides similar results in the assessment of stent deployment when using the MUSIC criteria. When compared to IVUS, there was greater agreement of PI OCT interpretation with core lab determinations for each MUSIC Component (expansion, symmetry, apposition).

Late Malapposition and Endothelial Coverage of Drug-Eluting-Stents, a Prospective Optical Coherence Tomography Study

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Background: Uncovered stent struts of drug-eluting-stents (DES) are associated with late stent thrombosis. Early and late malapposition of stent struts may be the major mechanisms for uncovered struts. Data regarding coverage of malapposed struts are missing.

Aim: This study examines malaposition of DES and the coverage of late malapposed struts in patients who underwent elective percutaneous coronary intervention (PCI).

Methods: Fifty patients treated with 60 DES (25 Everolimus-eluting stents [EES], 18 Zotarolimus-eluting stents [ZES], 17 Biolimus-eluting stents [BES]) underwent