Hypothesis: We hypothesized that, compared with IVUS, PI's experienced with both imaging techniques would interpret OCT images with less inter-observer variability and less deviation from core lab readings in the assessment of deployed coronary stents.
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 mm^2 compared with 0.87 mm^2 for OCT ($p = 0.042$). Similarly, in assessment of reference vessel CSA, these values were 2.37 mm^2 and 1.28 mm^2 for IVUS and OCT respectively ($p = 0.022$). Among the PI reviewers, inter-observer variability (standard deviation of the mean readings) for measurement of in-stent CSA was 1.34 mm^2 using IVUS compared with 0.85 mm^2 using OCT ($p = 0.024$); for measurement of average reference vessel CSA this variability using IVUS was 2.31 mm^2 compared with 0.91 mm^2 using OCT ($p = 0.016$).
Conclusion: Compared to IVUS, PI's interpretation of OCT images have less variation and more closely reflect core lab evaluation.

CRT-312

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, PIs 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 PIs from both academic and non-academic practices. The PIs 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 PIs, 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 PIs 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 PIs 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 Criteria component (expansion, symmetry and apposition).

CRT-313

The Lost Stent Struts in Acute Coronary Syndrome; an Optical Coherent Tomography Analysis

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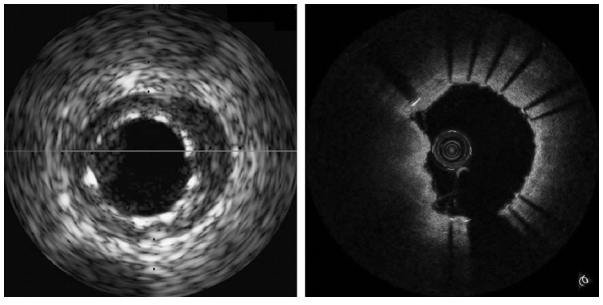
Background: Stent struts are hard to assess in patients with acute coronary syndrome due to prominent thrombi burden.
Methods: We used optical coherent tomography (OCT) to assess struts number of the implanted stents in 42 pts with acute coronary syndrome (ACS) and compared them to stent struts in 17 stable angina (SA) pts. We divided the appearance of stent struts into four categories; [1] well apposed, [2] covered by the thrombus, [3] malapposed, and [4] invisible (not detectable).
Results: 10,759 stent struts of ACS and 4,353 stent struts of SA pts were analyzed. Vessel size (7.33 ± 2.48 mm^2 in ACS vs 7.27 ± 2.28 mm^2 in SA, p=0.939) and minimal stent area (5.94 ± 2.12 mm^2 in ACS vs 6.13 ± 1.63 mm^2 in SA, p=0.734) were similar. Stent diameter was 3.35 ± 0.45 mm in ACS vs 3.47 ± 0.41 mm in SA (p=0.378), and stent length was 19.69 ± 6.53 mm in ACS vs 19.11 ± 6.62 mm in SA (p=0.762). Stent underexpansion (minimal stent area $<5mm^2$) was seen in 18/42 (42.8%) in ACS vs 6/17 (35.2%) in SA (p=0.769). Most stent struts were well apposed [8,407/10,759 (78.1%) in ACS vs 3,696/4,353 (84.9%) in SA, (p=0.601)]. 607/10,759 (5.6 %) stent struts were malapposed in ACS versus 292/4,353 (6.71%) in SA (p=0.430). Stent struts were often covered by thrombus in ACS [1,514/10,759 (14.1%)]. Although well apposed stent struts were similar, the rate of "not detectable" stent struts was higher in ACS than SA [228/10,759 (2.11%) in ACS vs 40/4,353 (0.92%) in SA, p=0.045]. 94.7% (216/228) of "not detectable" stent struts were associated with red thrombus, and plaque prolapse was in 5.3% (12/228).
Conclusion: Stent struts were frequently buried and not detectable due to thrombi burden in ACS pts. A compensated technology is necessary to avoid these misinterpretations.



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Late Malappositin 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 malapposition 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