

TCT-664

Impact of Obesity on Coronary Atherosclerosis Assessed by Grayscale and Virtual histology Intravascular Ultrasound

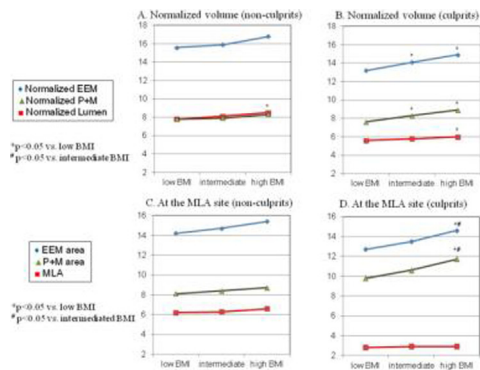
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Background: Obesity is a risk factor of coronary atherosclerosis, but the impact of body mass index (BMI) on lesion morphology is not known.

Methods: ADAPT-DES was a prospective, multicenter study of pts undergoing PCI with DES. In 773 pts, 831 culprit (CL) and 768 non-culprit lesions (NCL) were evaluated by volumetric grayscale & virtual histology (VH)-IVUS.

Results: As compared to NCLs, CLs showed greater normalized plaque volume (8.2mm² [inter-quartile range 8.0–8.5mm²] vs. 8.0mm² [7.7–8.2mm²], p=0.02) and smaller normalized external elastic membrane (EEM), (14.0mm² [13.7–14.4mm²] vs. 16.1mm² [15.6–16.6mm²], p<0.001) & lumen volumes (5.8mm² [5.7–6.0mm²] vs. 8.1mm² [7.8–8.4mm²], p<0.001) & minimal lumen area (MLA, 2.9mm² [2.8–2.9mm²] vs. 6.4mm² [6.1–6.6mm²], p<0.001). On tertile analysis by BMI, NCLs showed no difference in normalized plaque, EEM, or lumen volumes among the groups (all ANOVA p>0.05, Fig A). Conversely, in CLs, greater normalized plaque and %plaque volume were seen in pts with higher BMI; however, an increased EEM preserved lumen volumes (p>0.05, Fig B). At the MLA site, there was no difference in NCL EEM, plaque, and lumen areas among tertiles (p>0.05, Fig C); CLs in the high BMI group had larger plaque and EEM areas, but similar MLA vs lower BMI groups (Fig D). There was no difference in VH-IVUS plaque composition in CL and NCLs among tertiles.



Conclusions: High BMI was associated with greater plaque burden in CLs, but not in NCLs. However, because of more positive remodeling, lumen volume and MLA in the high BMI group remained similar to the lower BMI groups.

TCT-665

Co-registration of Optical Coherence Tomography and X-ray Angiography in Percutaneous Coronary Intervention. The Does Optical Coherence Tomography Optimize Revascularization (DOCTOR) Fusion Study

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Background: Intracoronary imaging bears advantages in sizing and positioning of coronary stents. After identifying a target area using intravascular ultrasound or optical coherence tomography (OCT) it is often challenging to identify the exact corresponding segment on the angiography. Software based on-line co-registration may aid the target segment identification.

Methods: The study is a prospective, observational, single arm, pilot study planned for inclusion of 20 patients. Patients admitted for elective percutaneous coronary

intervention are offered inclusion if OCT is not contraindicated. After identifying the target area, and marking the desired stent borders using OCT (Illumin, St. Jude Medical, USA) the operator marks on the angiogram where he believes the corresponding stent borders should be for assessment of the "operator registration error". The error between the software co-registration based stent borders and the actual stent deployment position is the "operator positioning error". Co-registration was performed by the QAngioOCT RE software, Medis Special. The study is approved by the Mid Jutland medical ethics committee.

Results: At deadline 9 patients were included. Preliminary results: On-line co-registration pre stenting was successful in all cases. In one case the one-point landmark registration had to be repeated due to incorrect matching. Co-registration and matching of one post intervention OCT pullback was not possible due to a major OCT pullback inconsistency. Based on limited data, the mean numerical operator registration error was 4.5±2.2 mm. The mean numerical operator positioning error was 5.2±2.0 mm. Indicated lesion area uncovered by stent (geographical miss) was found in one patient.

Conclusions: Software based on-line co-registration may be superior to operator based registration. Correspondence errors and longitudinal OCT pullback inconsistencies impacts feasibility. Final study result to be presented at TCT2013.

TCT-666

Intravascular Ultrasound Derived Minimal Lumen Area Criteria For Functionally Significant Left Main Coronary Artery Stenosis

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Background: The aim of this study was to determine the best intravascular ultrasound (IVUS) minimal lumen area (MLA) criteria for predicting functional significance of intermediate left main coronary artery (LMCA) stenosis using fraction flow reserve (FFR) as the standard.

Methods: We identified 112 patients with an isolated ostial and shaft LMCA stenosis of 30%-80% angiographic diameter stenosis who underwent IVUS and FFR measurement.

Results: Overall, 66 (59%) lesions had an FFR <0.80 at maximum hyperemia. The LMCA lesion with FFR of ≤0.80 had smaller reference vessel, smaller minimal lumen diameter, higher diameter stenosis, longer lesion length, smaller minimal lumen area, larger plaque burden, and more frequent plaque rupture. The independent determinants of FFR of <0.80 were plaque rupture (odds ratio [OR] 4.51, 95% confidence interval [CI] 1.36-14.9, p=0.014), body mass index (OR 1.19, 95% CI 1.00-1.40, P=0.05), age (OR 0.95, 95% CI 0.90-1.00, P=0.033), and IVUS MLA (OR 0.37, 95% CI 0.25-0.56, P<0.001). The IVUS MLA value within the LMCA that best predicted an FFR <0.80 was 4.5mm² (77% sensitivity, 82% specificity, 84% positive predictive value, 75% negative predictive value, 80% accuracy, area under the curve=0.83, 95% CI=0.759 - 0.960, p<0.001). In various subgroups, the cut-off values of IVUS MLAs were between 4.1mm² and 4.5mm². In addition, adjustment by using body surface area, body mass index, and left ventricular mass did not improve the diagnostic accuracy over IVUS MLA alone.

Conclusions: In isolated ostial and shaft intermediate LMCA stenosis, an IVUS-derived MLA <4.5mm² is a useful criterion for predicting FFR <0.80.

TCT-667

Relationship Between Renal Function and Lesion Morphology: An ADAPT-DES VH-IVUS sub-study

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Background: Previous intravascular ultrasound (IVUS) studies showed similar coronary artery lesion morphology in pts with normal and diminished renal function (defined by creatinine clearance [CrCl]), except for more calcification in pts on hemodialysis. We sought to examine this issue in a larger study cohort.

Methods: ADAPT-DES was a prospective multicenter, registry of 8,583 consecutive pts treated with coronary drug-eluting stents designed to determine the predictors of stent thrombosis. A pre-specified grayscale and virtual histology (VH) IVUS