	OSE (29 lesions)	NonOSE (43 lesions)	P-value
FU Stent CSA, mm2	8.08±2.40	7.46±2.06	0.242
FU Lumen CSA, mm2	7.42±2.44	6.98±2.02	0.412
FU NIH CSA, mm2	0.69±0.51	0.50±0.36	0.065
FU Apposed & Covered, %	97.21	96.02	<0.0001
FU Apposed & Uncovered, %	2.32	3.58	<0.0001
FU Malapposed & Covered, %	0.22	0.25	0.673
FU Malapposed & Uncovered, %	0.10	0.11	0.771
FU Orifice branch site & Covered, %	0.12	0.00	<0.0001
FU Orifice branch site & Uncovered, %	0.03	0.04	1.000

CONCLUSION Achievement of OCT-guided OSE may improve the coverage of stent struts.

CATEGORIES IMAGING: Imaging: Intravascular

TCT-654

Neoatherosclerosis as Cause of In-Stent Restenosis: Prevalence and Predictors

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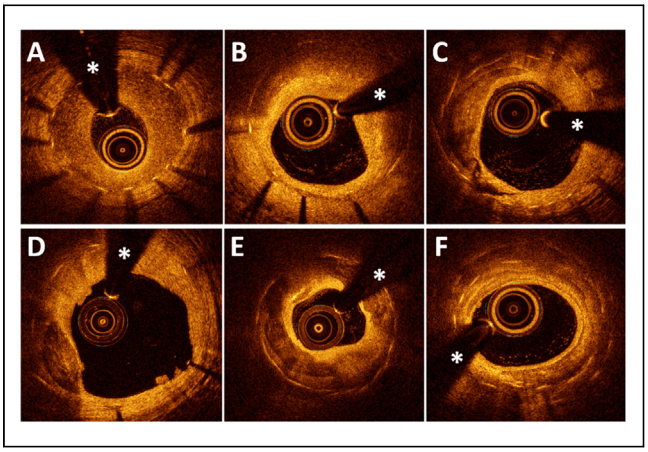
BACKGROUND Neoatherosclerosis (NA) is a major cause of in-stent restenosis (ISR). Optical coherence tomography (OCT) depicted different patterns of NA, including calcified sheets within the stent. Our aim was to describe the prevalence and predictors of calcified neoatherosclerosis (cNA).

METHODS We identified patients with a significant ISR (>50% DS within stent or in 5 mm pre or post) and evidence of ischaemia. OCT was performed before stent implantation. Predominant pattern of ISR by OCT was defined at zone of minimal lumen area, as well as frames 3 mm pre and post. Neointimal hyperplasia was defined as high volume homogeneous-signal tissue. Non-calcified NA was defined as thin-cap fibroatheroma or a lipid-laden neointima, while cNA as calcified sheet within the stent.

RESULTS From January 2014 to August 2016, we identified 81 restenotic lesions (75 patients) evaluated by OCT. In 16% of them, cNA was the predominant pattern of ISR, being all very-late ISR. Those patients with cNA were older (71 ± 9 years vs 66 ± 10 years, p=0.0157), with worse LDL control (97 ± 29 mg/dL vs 81 ± 30 mg/dL, p=0.0746) and with less percentage of treatment with statins (54% vs 85%, p=0.006) and angiotensin-converting-enzyme inhibitors/ angiotensin receptor blockers (ACEi/ARB) (31% vs 65%, p=0.003). Absence of treatment with statins (odds ratio 12.6, 95% CI, 1.7-92, p=0.012) or ACEi/ARB (odds ratio 6.2, 95% CI, 1.01-38, p=0.048) were independently associated with cNA.



CONCLUSION One fifth of the patients with clinical ISR showed cNA. The absence of previous treatment with statins or ACEi/ARB is independently associated with cNA.

CATEGORIES IMAGING: Imaging: Intravascular

TCT-655

Derivation and Validation of a Luminal Diameter Correction Factor for Determination of Stent Sizing by Optical Coherence Tomography: An ILUMIEN III sub-study

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BACKGROUND The ILUMIEN III randomized trial demonstrated that an optical coherence tomography (OCT)-based external elastic lamina (EEL)-guided stent-sizing strategy is safe and results in stent dimensions similar to IVUS guidance. Given the ease of use of OCT automated mean lumen diameter (MLD) measurements, approximating EEL-based stent sizing might be desirable. We sought to determine whether an MLD correction factor (MLDCorr) could be used to choose similar stent diameters to EEL-based sizing, obviating the need to identify and measure the EEL.

METHODS A correction factor for stent sizing was derived by subtracting the reference segment MLD from the EEL in 140 OCT acquisitions from ILUMIEN III. Validation was performed in one-hundred prospective OCT acquisitions. In the validation cohort, stent diameter was determined by measuring reference mean EEL diameter (if ≥180 degrees was visible) and was compared to MLD multiplied by the correction factor (MLDCorr). The smaller of the proximal or distal reference diameters were rounded down to the nearest 0.25mm to determine stent diameter.

RESULTS Baseline characteristics were well matched between the derivation and validation groups. When the proximal correction factor (1.32 [IQR 1.23,1.37]) was applied to the proximal MLD, mean vessel diameter was similar between EEL and MLDCorr (4.14 ± 0.80 vs.4.08 ± 0.66, p=0.56; R2=0.73, p<0.0001). Similarly when the distal correction factor (1.25 [IQR 1.19,1.36]) was applied to the distal MLD, mean vessel diameter was similar between EEL and MLDCorr (3.34 ± 0.67 vs 3.44 ± 0.58, p=0.29; R2=0.73, p<0.0001). However, stent-sizing by MLDCorr led to discordance of chosen stent size by at least 0.25mm in 63% of cases (P<0.001). Furthermore, MLDCorr led to stent over-sizing in 41% of cases (by ≥0.25mm in 22%, ≥0.50mm in 13%, ≥0.75mm in 3% and ≥1.0mm in 3% (p<0.001).

CONCLUSION Routine use of an MLD correction factor leads to significant stent-sizing discordance compared to EEL-sizing, with frequent stent over-sizing presenting potential for harm. A universal MLD correction factor cannot be recommended to replace OCT-based EEL measurement for stent sizing.

CATEGORIES IMAGING: Imaging: Intravascular

TCT-656

Intravascular Ultrasound Morphologic Comparison of In-stent Chronic Total Occlusion Versus Non-Occlusive In-stent Restenosis

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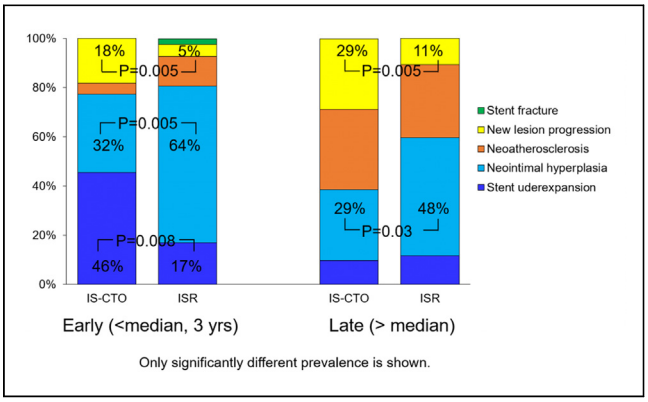
BACKGROUND The reason why in-stent restenosis (ISR) presents as a chronic total occlusion (CTO) vs non-occlusive restenosis is unknown.

METHODS Intravascular ultrasound (IVUS) findings from 74 in-stent (IS)-CTOs were compared with 218 non-occlusive ISR lesions. The primary mechanism of occlusion vs restenosis was categorized as 1) stent underexpansion (minimum stent area <5.0mm2), 2) excessive neointimal hyperplasia (NIH), 3) neoatherosclerosis (calcified or attenuated NIH), 4) new lesion progression, or 5) stent fracture.

RESULTS The median duration from stent implantation was 3 years and was longer in IS-CTO vs ISR (6.9±4.5 vs 3.6±3.4 years, p<0.001). In the early cohort (duration from implantation < median), dominant cause was underexpansion or excessive NIH; underexpansion was more prevalent in IS-CTO, whereas NIH was more prevalent in ISR; there were 3 stent fractures primarily causing ISR (Figure). In the late cohort, dominant cause was neoatherosclerosis or NIH; and NIH was more prevalent in ISR. Regardless of duration, new lesion progression was more prevalent and reference plaque burden was greater (64.9 [55.0, 72.4] % vs 48.2 [37.0, 56.8] %, p<0.001) in IS-CTO vs ISR. In multivariable model, male (OR: 3.22, 95%CI: 1.28-8.10, p=0.01), non-LAD target vessel (OR: 2.27, 95% CI: 1.19-4.32, p=0.01), and duration from stent implantation (OR: 1.18, 95%CI: 1.08-1.28; p<0.001) were independently associated with IS-CTO.



CONCLUSION Compared to non-occlusive ISR, IS-CTOs were associated with more diffuse disease and longer duration from stent implantation and were more in non-LAD locations.

CATEGORIES IMAGING: Imaging: Intravascular

TCT-657

The PRAGMATIC Study: A Prospective Randomized Clinical Trial comparing Radial Artery Intimal Hyperplasia resulting from a 7F Sheathless Guide (Mach 1TM) vs. a 6F Transradial Sheath/Guide Combination in Coronary Intervention

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BACKGROUND Transradial (TR) PCI has been shown to have potential advantages over a transfemoral approach in terms of vascular complications, bleeding risks and time to ambulation. However, a major drawback to TR-PCI is that the small diameter of the radial artery may limit the use of larger guide catheters that provide more support for complex interventions. To circumvent this, the technique of sheathless TR-PCI has been recently introduced. However, thus far no randomized clinical trials comparing these techniques with regards to radial artery access site trauma and healing have been performed.

METHODS We randomized 41 patients at a single institution to undergo PCI with a sheathless 7F Mach 1TM guide catheter or with a 6F CordisTM /Mach 1TM sheath/guide catheter combination. Patients then underwent ultra-high resolution duplex ultrasound assessment of the radial artery access site at 24-hours (pre-discharge) and 90 day post PCI. We used a non-inferiority analysis to compare 90 day post PCI radial artery intimal-medial thickness between the 2 groups. Other ultrasound indicators of trauma (occlusion, pseudoaneurysm, dissections, etc) were also recorded. Secondary endpoints included procedural success rates, procedural time, and the rate of cross-over to TF PCI.

RESULTS The sheathless 7F approach was non-inferior to the 6F sheath/guide combination for the primary endpoint of radial artery intimal-medial thickness at 90 days (2.4 vs 2.5, p= 0.262 for non-inferiority). Procedural times (16.2 vs 11.5, p=0.167), PCI success rates (96 vs 90, p=0.588) and other ultrasound determined access site complications, including radial artery occlusion (2 vs 1, p=1), radial artery tears (0 vs 1, p=0.463), and radial artery pseudoaneurysm (1 vs 0, p=1) were similar between the two groups.

CONCLUSION For TR-PCI, the routine use of a 7F sheathless approach is associated with similar success rates, procedure times and no difference in access site vascular healing compared with a traditional 6F sheath/guide combination. These findings suggest that a 7F sheathless approach can be considered as an attractive option for PCI in cases where larger bore guide catheters or greater support is required.

CATEGORIES IMAGING: Imaging: Non-Invasive

TCT-658

Ischaemic postconditioning reduces the extent of myocardial necrosis and microvascular obstruction zone in acute ST-elevation myocardial infarction

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BACKGROUND Postconditiong (postcon) has been reported to reduce infarct size in ST-segment myocardial infarction (STEMI). However recently few other studies did not show any effect of postcon or suggested that it may be even harmful. We sought to assess whether postcon could reduce infarct size (IS) and microvascular obstruction (MVO) zone in early presenters with high-risk STEMI.

METHODS 74 STEMI patients treated with primary coronary intervention (PCI) were randomly assigned to postcon group (n=37) or standard PCI group (n=37). Postcon was performed immediately after obtained reperfusion with 4 balloon occlusions, each lasting 30 seconds, followed by 30 seconds of reperfusion. Cardiac magnetic resonance was performed in all subjects within 48 to 96 hours after the admission. Morphology and function of myocardium was estimated by a steady-state free precession (SSFP) sequence. To evaluate the infarct size and MVO, a late gadolinium enhancement (LGE) technique was performed.Infarct size was defined as an area greater than 50% of the maximal signal intensity within LGE. MVO was defined as an area of the absence or hypoenhancement of contrast surrounded by LGE. Infarct size and MVO were determined by planimetry and a summation of discs method.

RESULTS Postcon was associated with significantly smaller IS (16.58±9.6 vs 31.2±22.9 g; p=0.007) and higher ejection fraction (59.8±9.2% vs 52.3±10.2%) as well as in lower creatinine kinase and troponin I peak serum level (2297±1391 vs 3268±1163; p<0.001 and 47.4± 57.1 vs 136±122; p<0.01, respectively). The extent of MVO was significantly lower in postcon group in comparison to control group (0.71± 1.4g vs 2.2±3.2g; p=0.03).