eventually additional stent implantation in SB ostium) while leading to ischemic compromise. Nevertheless, there is little data using FD-OCT imaging to better understand the relationship between underlying plaque and acute stent-vessel interactions in this setting. We aim to evaluate, by means frequency-domain optical coherence tomography (FD-OCT), the impact of main branch (MB) calcified plaques outside branch (SB) occlusion after MB stent implantation in coronary bifurcations.

Methods: We evaluated 78 patients with native de novo coronary bifurcation lesions with SB deserving wire protection (side-branch length greater than 50mm) who underwent MB FD-OCT before stent implantation. FD-OCT assessments were performed pre-PCI to evaluate the plaque type calcium and non-calcium (fibrous and lipid) of main branch. SB occlusion was defined as % diameter stenosis greater than 75% of SB ostium by angiogram after MB stent implantation.

Results: Occlusion of SB occurred in 43.6% while 18 patients required balloon angioplasty for SB occlusion. In multivariable analysis, true bifurcation (odds ratio [OR]: 3.70; 95% confidence interval [CI]: 1.13 to 12.58; p = 0.030) and calcified plaque determined by FD-OCT assessments (OR: 17.11; 95% CI: 4.97 to 58.96; p < 0.001) were independent predictors of SB occlusion after MB stent implantation.

Conclusions: Calcified plaque demonstrated by FD-OCT assessments as well as true bifurcations were identified as independent predictors of SB occlusion after MB stent implantation.

TCT-581
Optical coherence tomography during everolimus-eluting bioabsorbable vascular scaffold implantation in patients with acute coronary syndrome.

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Background: Everolimus-eluting bioabsorbable vascular scaffold (BVS) is a new promising therapeutic technology for the treatment of coronary heart disease. However, clinical experience with this device is still limited in patients with acute coronary syndrome and thrombus containing lesions. The purpose of this study is to analyze the usefulness of the optical coherence tomography (OCT) in the monitoring of these procedures.

Methods: From January 2012 to May 2013, 66 patients with acute coronary syndrome were treated by BVS implantation. After identification of the culprit lesion, a baseline intravascular ultrasound study (IVUS) was performed. Taking into consideration the IVUS information, direct stent deployment was carried out in 44 patients (67%). After the BVS implantation, an OCT catheter was advanced distal to the area of interest over a conventional coronary guide-wire. Several pullbacks were performed to obtain an optimal visualization of the treated segment.

Results: The mean age was 55±9 years, 25 (38%) patients had ST elevation and the remaining 41 had ACS without ST elevation. After treatment, the percentage of stenosis changed from 81±15% to 6±6%. According to the angiographic criteria, the procedure was successful in all 66 patients. However, immediately after the BVS deployment the OCT showed the following negative results of real-world pts undergoing percutaneous coronary intervention who also had intracoronary imaging using near infrared spectroscopy (NIRS).

Methods: We investigated the relationship between the extent of lipid rich plaque (LRP) assessed by pre-intervention NIRS at the time of drug-eluting stent (DES) implantation and subsequent DES failure (stenosis or thrombosis). Raw spectroscopic information was transformed into a probability of LRP; pixels with a probability of LRP >0.6 were divided by all viable pixels to generate the lipid-core burden index (LCBI). Case-control matching was performed with respect to age, gender, diabetes, baseline symptoms, stent type, stent length, and time to event.

Results: Eleven pts who developed DES failure [10 restenosis (1 proximal edge, 9 in-stent) and 1 subacute stent thrombosis] at a median of 363 days (range 8-598 days) post-implantation and NIRS study were compared to 27 matched cases without stent failure. Baseline characteristics were well-matched between the groups (Table). Although stent length and final diameter stenosis were similar in both groups, stented segment LCBI was significantly greater in the stent failure group than in the control group with no different in the adjacent reference segments. Importantly, DES failure was not seen in the setting of a maxLCBI4mm <100.

Conclusions: Angiography has limitations in the assessment of the immediate results after BVS treatment of coronary lesions. However, OCT is an useful adjunctive tool during the monitoring of this procedure in patients with acute coronary syndromes.

TCT-582
Association Of Coronary And Carotid Artery Plaque Composition By Intravascular Ultrasound Virtual Histology With Stent Restenosis And Plaque Progression

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Background: Atherosclerosis is a systemic inflammatory disease involving multiple arterial beds. Despite differences in the coronary and carotid vasculature, both vascular distributions are believed to share common pathways in disease progression. It is not known whether the atherosclerotic plaque composition is associated with stent restenosis and atherosclerosis progression.

Methods: In Latvian Registry of Cardiology patients for previous indications underwent coronary and carotid angiography. Patients with concomitant coronary and carotid artery disease defined as ≥50% stenosis were included in single-center, prospective study. All patients were scheduled for carotid and/or coronary artery stenting and prior to intervention IVUS-VH (Eagle Eye; Volcano Therapeutics Inc; CA, USA) imaging of coronary and carotid plaque were done. Angiography and IVUS-VH follow-up was scheduled after 10 month.

Results: 100 consecutive patients (60% men), mean age 69±8.4 years, were enrolled. 78.0% of patients (n=78) underwent carotid stenting and 36.0% (n=36) had PCI. For 75 patients angiographic and IVUS-VH follow-up was done (mean 489 days, 95% CI 507.0-631.8). Carotid restenosis rate was 1.8% (n=1). 3 of 17 patients (17.6%) had plaque progression and consequent carotid stenting. Coronary restenosis rate was 25.8% (8 of 31 patients). We found no difference in untreated carotid plaque tissue composition by IVUS-VH at baseline between progressive (n=3) and nonprogressive (n=14) carotid plaques (fibrotic tissue 56.7±8.4% vs 57.3±7.4%, p=0.898, fibrolipids 15.0±7.5% vs 18.7±9.3%, p=0.531, calcified 5.7±3.5% vs 5.8±4.0%, p=0.959, necrotic core 22.5±12.9% vs 18.4±9.7%, p=0.548). Similarly, no association with IVUS-VH characteristics of culprit lesion at baseline was found between coronary restenosis (n=8) and no-restenosis (n=23) group.

Conclusions: Atherosclerotic plaque tissue characteristics by IVUS-VH were not associated with carotid plaque progression and frequency of restenosis in coronary arteries in these series. Restenosis rate in carotid arteries is low in comparison with coronary arteries regardless of the stenosis morphological differences.

TCT-583
The Extent of Lipid-Rich Plaque Assessed by Near-Infrared Spectroscopy May Predict DES Failure: A COLOR Registry Analysis

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Background: The COLOR Registry is a prospective, multicenter observational study of real-world pts undergoing percutaneous coronary intervention who also had intracoronary imaging using near infrared spectroscopy (NIRS).

Methods: We investigated the relationship between the extent of lipid rich plaque (LRP) assessed by pre-intervention NIRS at the time of drug-eluting stent (DES) implantation and subsequent DES failure (stenosis or thrombosis). Raw spectroscopic information was transformed into a probability of LRP; pixels with a probability of LRP >0.6 were divided by all viable pixels to generate the lipid-core burden index (LCBI). Case-control matching was performed with respect to age, gender, diabetes, baseline symptoms, stent type, stent length, and time to event.

Results: Eleven pts who developed DES failure [10 restenosis (1 proximal edge, 9 in-stent) and 1 subacute stent thrombosis] at a median of 363 days (range 8-598 days) post-implantation and NIRS study were compared to 27 matched cases without stent failure. Baseline characteristics were well-matched between the groups (Table). Although stent length and final diameter stenosis were similar in both groups, stented segment LCBI was significantly greater in the stent failure group than in the control group with no different in the adjacent reference segments. Importantly, DES failure was not seen in the setting of a maxLCBI4mm <100.
Conclusions: Pre-intervention NIRS revealed more LRP in lesions that subsequently developed DES failure compared to DES-treated lesions without stent failure. Pre-intervention NIRS evaluation may help to identify lesions at high risk of DES thrombosis or restenosis.

TCT-S84

Late Stent Malaposition of Drug-Eluting-Stents With and Without Bioabsorbable Polymer - 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 malaposition of stent struts may be the major mechanisms for uncovered struts. Durable polymer may contribute to late acquired stent malaposition. Optical coherence tomography (OCT) enables the evaluation of stent strut aposition due to high-resolved intravascular images.

Methods: This study examines malaposition of DES with and without bioabsorbable polymer in patients who underwent elective percutaneous coronary intervention (PCI). Fifty patients treated with 60 DESs (25 Everolimus-eluting stents [EES], 18 Zotarolimus-eluting stents [ZES], 17 Biolimus-eluting stents [BES]) underwent OCT directly after implantation and after 12 months.

Results: Postintervention acute stent malaposition (ASM) occurred in 30 stents (50%). Of these, malapositions in 21 stents resolved completely (70%), whereas 9 malapositions persisted after one year (30%), malposed segments in 6 stents resolved partly whereas malapositions in 3 stents persisted completely. At this time-point, a total 15 stents (25%) with late stent malapositions were detected due to late acquired stent malaposition (LASM) in 10 stents (17%). The occurrence of LASM was significantly higher in stents without bioabsorbable polymer (10 in EES and ZES - 100%) than in stents with bioabsorbable polymer (0 BES - 0%; p=0.0492).

Conclusions: The use of bioabsorbable polymer may reduce late acquired stent malaposition.

TCT-S85

Circulating CD31+CD45- endothelial but not endothelial progenitor cells relate to re-endothelialization of drug-eluting stents: results from 40 patients undergoing optical coherence tomography

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Background: Due to the lack of imaging modalities with a resolution down to the magnitude of a few cells, the direct influence of endothelial progenitor cells (EPC) on re-endothelialization of drug-eluting stents has not been established in patients. Here, we assessed the potential of different subsets of circulating endothelial cells and EPC to influence stent re-endothelialization using second generation optical coherence tomography (OCT).

Methods: In 40 patients, everolimus-eluting stents were assessed by optical frequency domain intensity OCT 5-7 months after stent implantation. Stent strut coverage as well as neointima formation was derived from detailed analysis of OCT data. Circulating endothelial cells (CEC; CD31+CD45-) and different subsets of EPC (e.g. CD34+KDR+, CD34+KDR+CD45dim) were analyzed by flow cytometry. Statistical analysis was performed by mixed linear effect models integrating OCT and flow cytometry data as well as multiple clinical variables.

Results: Stent strut coverage and frequency of different cell populations were highly comparable with previous OCT and flow cytometry data. On univariate and in mixed linear effect models, no association between EPC counts and re-endothelialization was detected. For CD31+CD45- counts, an inverse relationship with re-endothelialization was identified by mixed linear effect model building adjusting for age, female sex, diabetes mellitus, NYHA and CCS staging, serum triglycerides, glucose, and creatinine (beta = -8.375, p<0.011).

Conclusions: Circulating CEC were associated with low stent strut coverage. There was no significant association between circulating EPC and healing after drug-eluting stent implantation. These data suggest that endothelial damage quantitated by CEC may represent a more important mediator of late stent re-endothelialization than endovascular repair assessed by EPC.

<table>
<thead>
<tr>
<th>Age at 1y FUP</th>
<th>Pat. with bioabsorbable polymer DES n = 13</th>
<th>Pat. with durable polymer DES n = 37</th>
<th>Total n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>56.4 (IQR: 51.5 - 60.0)</td>
<td>61.6 (IQR: 54.2 - 70.0)</td>
<td>60.2 (IQR: 53.0 - 66.0)</td>
<td></td>
</tr>
<tr>
<td>Gender (m/f)</td>
<td>10 / 3</td>
<td>29 / 8</td>
<td>39 / 11</td>
</tr>
<tr>
<td>FUP period</td>
<td>364.2 (±7.3)</td>
<td>363.3 (±18.4)</td>
<td>363.3 (±18.0)</td>
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<tr>
<td>DES (EES/ZES/BES)</td>
<td>n = 17 (17/17)</td>
<td>n = 43 (25/17/17)</td>
<td>n = 60</td>
</tr>
<tr>
<td>Stent length</td>
<td>22.94 (±7.26)</td>
<td>23.3 (±8.07)</td>
<td>23.2 (±7.79)</td>
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<tr>
<td>Stent diameter</td>
<td>2.99 (±0.38)</td>
<td>2.97 (±0.4)</td>
<td>2.97 (±0.39)</td>
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<tr>
<td>Struts total 1y*</td>
<td>3.291</td>
<td>12.385</td>
<td>15.676</td>
</tr>
<tr>
<td>DES with LASM</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>DES without LASM</td>
<td>17</td>
<td>33</td>
<td>50</td>
</tr>
</tbody>
</table>

* MaxLCBI4mm – maximum LCBI in any 4mm-long segment