CONCLUSIONS PRASFIT Elective OCT sub-study revealed the plaque morphology and acute SM area were the predictors for late phase SM, and late phase SM was associated with the presence of IS-Th at 8-mo, which could be the substrate for late stent thrombosis.

CATEGORIES IMAGING: Intravascular

KEYWORDS Malapposition, OCT, Plaque morphology

TCT-45 Optical Coherence Tomography Assessment of Incidence, Morphological Characteristics, and Spontaneous Healing Course of Edge Dissections Following Percutaneous Coronary Intervention with Stent Implantation in Patients with Non-ST segment Elevation Myocardial Infarction

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BACKGROUND Stenting-induced edge dissections (ED) can be assessed in detail by OCT. This study sought to investigate the incidence, morphological characteristics, and spontaneous healing course of optical coherence tomography (OCT) identified EDs following drug-eluting stent (DES) implantation in a Non-ST segment Elevation Myocardial Infarction (NSTEMI) patient-population.

METHODS Acute vessel wall injury at the 5-mm stent adjacent distal and proximal reference segments was assessed by post-procedure OCT and intravascular ultrasound (IVUS) in n=97 NSTEMI-patients (n=97 lesions). Six months OCT follow-up was available in 82 patients (including 35 untreated post-procedure EDs).

RESULTS The overall incidence of post-procedure OCT-detected ED was 38 per 97 patients (39.2%), and 47 per 182 stent edges (25.8%). None of the EDs were angiographically visualizable, while 10 (21.3%) were visible on concomitant IVUS-analysis. Morphologically, there was a significant difference in plaque type present at ED-edges vs. non-ED-edges when assessed with OCT; (1) lipid-rich and calcified plaques: 80.9% vs. 57.0%, (2) fibrous plaque: 17.0% vs. 26.7%, and (3) normal coronary vessel: 2.1% vs. 16.3%, p<0.01. Plaque burden, assessed by IVUS, was substantially larger at ED-containing borders: 54.5 ± 10.0% vs. 43.7 ± 11.6%, p<0.01. Three dissections (8.6%) were incompletely healed at 6-month OCT follow-up. None of the EDs caused cardiac events during the 6-month follow-up, however, 1 ED-patient had target lesion revascularization with PCI and DES-implantation in extension of the scheduled OCT-control.

CONCLUSIONS OCT-detected EDs were frequent after stent implantation due to NSTEMI, and the majority of these EDs healed without leading to an adverse prognosis at 6 months.

CATEGORIES IMAGING: Intravascular

TCT-46 OCT-based management of late stent thrombosis: results from the SAFE registry

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BACKGROUND Late stent thrombosis is an infrequent complication of PCI, but is associated with high risk of recurrent ischemic events. OCT can help determine the mechanism of stent thrombosis and thus optimize management. We hypothesize that the use of OCT in stent thrombosis will substantially change how PCI is performed.

METHODS SAFE (Study of Late Stent Failure Evaluated by OCT) is a multicenter registry of consecutive cases of late stent thrombosis (>30 days) who underwent diagnostic OCT before intervention. Investigators agreed on a treatment approach (repeat stenting or
angioplasty alone) based on correction of malposition and under-expansion being performed first, while repeat stenting was reserved for cases with significant inartistic tissue proliferation. Both the angiogram and the pre-intervention OCT were analyzed separately by the core lab team. For each case, the core lab would assign a virtual treatment approach based on the angiogram alone or based on the OCT alone.

RESULTS 70 cases of late stent thrombosis were analyzed. Based on OCT, inartistic thrombus was identified in all the cases. Excessive tissue proliferation was noted in 27 patients, uncovered / malapposed struts in 27 patients, both findings in 14 patients, and no clear culprit in 2 patients. By angiography, excessive tissue proliferation was noted in 37 patients, uncovered/malapposed struts in 19 patients, and no clear culprit in 14 patients. There was poor agreement between OCT and angiography (kappa 0.11, p=0.11). Based on the proposed algorithm, the virtual treatment strategy was changed by OCT relative to angiography guidance in 32.8% of the cases, with repeat stenting advocated for only 51% of the cases.

CONCLUSIONS OCT can effectively identify multiple intra-stent pathologies in late stent thrombosis. Information obtained from OCT can substantially change how PCI is performed when a predefined treatment algorithm is followed.

CATEGORIES IMAGING: Intravascular

KEYWORDS OCT, Stent thrombosis, late

TCT-47

Comparative Optical Coherent Tomographic analysis of in-stent neoatherosclerosis between 1st and 2nd generation drug-eluting stent

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BACKGROUND Although in-stent neoatherosclerosis contributes to late failure of bare metal and first generation drug eluting stent (DES), there is lack of data on new, 2nd generation DES. The aim of this study was to compare the characteristics of in-stent neoatherosclerosis of 2nd generation DES and 1st generation DES using optical coherence tomography (OCT).

METHODS Pre-procedural OCT and grayscale intravascular ultrasound were analyzed in 86 patients (58 stable angina, 28 acute coronary syndrome) who underwent clinically-driven target lesion revascularization (TLR) within the 4 years after DES placement. 1st generation DES group was composed of 16 sirolimus-eluting stents and 35 paclitaxel-eluting stents; and 2nd generation DES was composed of 21 everolimus-eluting stents, 9 zotarolimus-eluting stents, and 2 novolimus-eluting stents.

RESULTS The median duration for target lesion failure were 11.2 months (IQR 5.7-23.6 months) in 1st generation DES and 8.9 months (IQR 6.1-15.9 months) in 2nd generation DES (p=0.222). In both generations, focal stenosis was the predominant type of angiographic restenosis. Overall, 1st generation DES had more frequent OCT-defined in-stent thin-cap fibroatheroma (TCFA)-containing neointimal lesions than 2nd generation DES (53.3% vs 12.5%, p=0.032) and the significance was mainly developed after 12 months of DES implantation (TLR <12 months after implantation, 15.0% vs 18.2%, p=0.818, DES ≥12 months after implantation, 44.1% vs 9.5%, p=0.007). Otherwise there were no differences in other unstable neointimal morphology such as the frequency of rupture (42.6% vs. 25.0%, p=0.100), thrombi (46.3% vs. 46.9%, p=0.421) or microvessel (55.6% vs. 53.1%, p=0.827).

CONCLUSIONS The OCT morphological characteristics of in-stent neoatherosclerosis between generations of DES were similar. But 2nd generation DES demonstrated lesser OCT-detected TCFA than 1st generation DES, especially after 12 months of implantation.

Table 3. OCT findings of in-stent restenosis between generations of DES

<table>
<thead>
<tr>
<th>Category</th>
<th>1st generation (n=54)</th>
<th>2nd generation (n=32)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCFA</td>
<td>18 (33.3%)</td>
<td>4 (12.5%)</td>
<td>0.032</td>
</tr>
<tr>
<td>Lipidic neointima</td>
<td>30 (55.6%)</td>
<td>27 (87.5%)</td>
<td>0.404</td>
</tr>
<tr>
<td>Calcific neointima</td>
<td>6 (11.1%)</td>
<td>3 (9.4%)</td>
<td>0.799</td>
</tr>
<tr>
<td>Rupture</td>
<td>23 (42.6%)</td>
<td>8 (25.0%)</td>
<td>0.100</td>
</tr>
<tr>
<td>Microvessel</td>
<td>30 (56.5%)</td>
<td>17 (53.1%)</td>
<td>0.827</td>
</tr>
<tr>
<td>OCT or Rupture</td>
<td>30 (55.6%)</td>
<td>8 (25.0%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Stent pattern</td>
<td></td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Heterogenous</td>
<td>25 (46.3%)</td>
<td>12 (44.5%)</td>
<td></td>
</tr>
<tr>
<td>Lipidic neointima</td>
<td>30 (55.6%)</td>
<td>8 (25.0%)</td>
<td></td>
</tr>
<tr>
<td>Lipidic neointima</td>
<td>8 (14.8%)</td>
<td>7 (23.8%)</td>
<td></td>
</tr>
</tbody>
</table>

CATEGORIES IMAGING: Intravascular

KEYWORDS DES, Neoatherosclerosis, OCT

TCT-48

Early vascular responses to everolimus-eluting cobalt-chromium stent for the treatment of stable coronary artery disease: The results of MECHANISM-Elective 1-month OCT follow-up cohort

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