(27.3% vs. 8.7%, p = 0.019) and the size of thrombus was larger at non-spasm segments compared to non-spasm segments (0.31 ± 0.08 mm² vs. 0.04 ± 0.01 mm², p = 0.046). In spasm segments, thrombus was most frequently located at spasm sites (81%) followed by upstream of the spasm segments (19%). Thin cap fibroatheroma was mainly seen in non-spasm segments compared to spasm segments (21.6% vs. 4.7% vs. p = 0.039). Plaque erosion however, was more prevalent at spasm segments compared to non-spasm segments (26.0% vs. 6.5%, p = 0.008).

<table>
<thead>
<tr>
<th>OCT findings</th>
<th>Total (n = 120)</th>
<th>Spasm segments (n = 77)</th>
<th>Non-spasm segments (n = 46)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque Erosion</td>
<td>23 (18.7%)</td>
<td>20 (26.0%)</td>
<td>3 (6.5%)</td>
<td>0.008</td>
</tr>
<tr>
<td>Location of erosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proximal to analyzed site</td>
<td>4 (26.1)</td>
<td>2 (26.0)</td>
<td>2 (26.1)</td>
<td>0.986</td>
</tr>
<tr>
<td>At vessel/analyzed site</td>
<td>17 (73.9)</td>
<td>16 (78.0)</td>
<td>1 (31.3)</td>
<td></td>
</tr>
<tr>
<td>Thrombus</td>
<td>25 (20.3)</td>
<td>21 (27.3)</td>
<td>4 (8.7)</td>
<td>0.019</td>
</tr>
<tr>
<td>Red thrombus</td>
<td>4 (16.0)</td>
<td>4 (19.0)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>White thrombus</td>
<td>21 (84.0)</td>
<td>17 (81.0)</td>
<td>4 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Location of thrombus</td>
<td></td>
<td></td>
<td></td>
<td>0.053</td>
</tr>
<tr>
<td>Proximal to analyzed site</td>
<td>7 (28.0)</td>
<td>4 (19.0)</td>
<td>3 (75.0)</td>
<td></td>
</tr>
<tr>
<td>At vessel/analyzed site</td>
<td>16 (72.0)</td>
<td>17 (81.0)</td>
<td>1 (25.0)</td>
<td></td>
</tr>
<tr>
<td>Size of thrombus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of thrombus (mm²)</td>
<td>0.27 ± 0.54</td>
<td>0.31 ± 0.58</td>
<td>0.04 ± 0.01</td>
<td>0.046</td>
</tr>
<tr>
<td>Maximal diameter of thrombus (mm)</td>
<td>0.63 ± 0.53</td>
<td>0.68 ± 0.56</td>
<td>0.39 ± 0.08</td>
<td>0.037</td>
</tr>
</tbody>
</table>

CONCLUSIONS Compared to non-spasm segments, thrombus and plaque erosion were more common at spasm segments. These findings suggest the potential benefit and treatment role of antiplatelet therapy in VSA.

CATEGORIES IMAGING: Intravascular

KEYWORDS OCT, Thrombus, Vasospastic angina

TCT-342 Impact of Daily Glucose Fluctuation on Vessel Healing after 2nd Generation Drug-eluting Stent Implantation Assessed by Continuous Glucose Monitoring and Optical Coherence Tomography Masaru Kuroda,1 Toshiro Shinke,1 Hiromasa Otake,1 Tomofumi Takaya,1 Dajji Kashiwagi,1 Yuto Shinikura,1 Natsuko Tahara,1 Hiroti Kinutani,1 Hachidai Takahashi,1 DaiSuke Terashtia,1 Kenzo Uzu,1 Koji Kuroda,1 Yoshinori Nagasawa,1 Yushi Hirota,1 Kazuhiko Sakaguchi,1 Ken-ichi Hirata1

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BACKGROUND Several investigations revealed that daily glucose fluctuation has adverse effects on endothelial cells. Moreover, we reported that it may have an independent contributing factor on neointimal growth following everolimus-eluting stent implantation in coronary artery disease (CAD) patients. We aimed to investigate the impact of glucose fluctuation on neointimal growth following everolimus-eluting stent (EES) implantation.

METHODS This prospective study enrolled 70 consecutive CAD patients pretreated with adequate lipid-lowering therapy. 46 patients of them underwent 8-month follow-up optical coherence tomography after EES implantation. Glucose fluctuation, expressed as mean amplitude of glycemic excursion (MAGE) was determined by continuous glucose monitoring before percutaneous coronary intervention. Uniformity of neointimal distribution was evaluated in 3-D by computing mean neointimal thickness (NIT) within 360 equally spaced radial sectors for every 1-mm cross-section by OCT analysis 8 months after stenting. In addition, we analyzed % of uncovered struts at OCT follow-up. No changes were made to any of the medications for the control of diabetes, lipid, and hypertension.

RESULTS In total, 56 patients were evaluated in 46 patients. MAGE was significantly correlated with maximum NIT and standard deviation of NIT, representing the roughness of neointima within a whole stent (Figure). Moreover, higher MAGE was significantly associated with the higher percentage of uncovered struts (Figure). Multiple linear regression analysis showed MAGE had independently association with % of uncovered struts and standard deviation of NIT (standardized coefficient β = 0.586 and 0.381, respectively, both P < 0.005).

CONCLUSIONS Glucose fluctuation may impact the vessel healing after EES implantation in CAD patients receiving adequate lipid-lowering therapy. Further investigations should address the rationale for the early detection and control of glucose fluctuation in the era of universal statin use for CAD patients.

CATEGORIES IMAGING: Intravascular

KEYWORDS Drug-eluting stent, second generation, Glucose variability, OCT

TCT-343 Post-procedural geometrical parameters and their impact on adverse cardiovascular events: Insights from the ABSORB II trial

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BACKGROUND Mechanical properties of a fully bioresorbable poly-lactide scaffold are inherently different from a permanent metallic stent. A previous retrospective intravascular ultrasound (IVUS) study suggested that immediately after the procedure the Absorb scaffold was more eccentric and asymmetric compared to a Xience stent. However, the relationship between the IVUS parameters and clinical events has not been investigated in the context of a randomized trial.

METHODS In the ABSORB II trial comparing the Absorb scaffold and the Xience stent in treatment for a de novo coronary artery stenosis, protocol-mandated IVUS imaging was performed post procedure in 485 patients with 506 lesions (2:1 randomization, Absorb: 330, Xience: 176). The eccentricity index (EI) was calculated as a minimal value of the quotients (computed per cross section) of the projected minimum diameter and the projected maximal diameter. The asymmetry index (AI) was calculated per lesion as (1 - concentric/asymmetric) (EI ≥ 0.7 | MUSIC criterion | and AI ≤ 0.3); 2) concentric and asymmetric (EI ≥ 0.7 and AI > 0.3); 3) eccentric and asymmetric (EI < 0.7 and AI > 0.3).

RESULTS The overall results are presented in the Figure. Post-procedural EI was smaller in the Absorb arm than in the Xience arm (0.74±0.07 vs. 0.81±0.05, p<0.001), while AI was greater in the Absorb arm (0.31±0.08 vs. 0.37±0.10, p<0.001). At 1-year, the MACE rates were 8.2%, 6.0% and 2.3% in “eccentric/asymmetric” group, the “concentric/asymmetric” group and the “concentric/symmetric” group, respectively (p=0.04).
CONCLUSIONS In the ABSORB II randomized trial, the post-procedural scaffold/stent area on IVUS was more eccentric and asymmetric in the Absorb arm than in the Xience arm. At 1 year, MACE tended to be observed more frequently in lesions with high eccentricity and low symmetry for both, Absorb and Xience.

CATEGORIES IMAGING: Intravascular

KEYWORDS Bioabsorbable scaffolds, DES, IVUS

TCT-344 Abstract Withdrawn

TCT-345 Detailed Segmental Comparison Between a Dedicated Bifurcation Stent and Balloon Angioplasty Using Intravascular Ultrasound and Three-dimensional Quantitative Coronary Angiography: a Subgroup Analysis of the Tryton IDE Randomized Trial

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BACKGROUND The Tryton Side Branch Stent™ (Tryton Medical, Durham, NC) is a dedicated bifurcation bare-metal stent that, used in combination with a main branch drug-eluting stent (DES), was developed to improve outcomes and facilitate the treatment of bifurcations lesions.

METHODS The Tryton coronary bifurcation trial, including 704 patients, randomized patients in a 1:1 fashion to either a treatment strategy of main branch DES placement and side branch balloon angioplasty (SBBA), or a treatment with Tryton stent placement in combination with a main branch DES. The current data represents two pre-specified sub-studies: a 9-month intravascular ultrasound (IVUS) sub-study, primarily designed to investigate the occurrence of strut fractures, and a detailed segmental 9-month three-dimensional quantitative coronary angiography (3D-QCA) sub-study.

RESULTS Among the 704 patients enrolled in the Tryton trial, 159 (22.6%) and 190 (27.0%) patients were part of the pre-specified IVUS and 3D-QCA sub-group analyses, respectively. There were no differences in the main branch with regard to 9-month minimal lumen area (MLA) (3.3 ± 1.47 in Tryton group vs. 3.69 ± 1.72 mm2 in SBBA group, p = 0.24) with low neo-intima area in both groups on IVUS. For the distal main branch, there were no differences between the treatment arms with regard to the RVD, MLD and %DS on 3D-QCA (%DS: 13.32 ± 12.67% vs 13.69 ± 13.92%, p = 0.54). Importantly, in the proximal main branch, there were also no differences between both treatment arms with regard to the RVD and MLD, resulting in low percent diameter stenosis in both treatment arms which were equal between groups (%DS: 9.85 ± 7.19% vs 8.87 ± 9.71%, p = 0.50), suggesting the proximal Tryton with main branch DES overlap does not negatively influence the favorable healing of the DES. In the side branch, there was also no statistical significant difference in MLA between both groups (3.04 ± 1.02 in Tryton vs. 3.46 ± 1.15 mm2 in SBBA, p = 0.07). On 3D-QCA, no differences in minimal lumen diameter (MLD) and percentage diameter stenosis (%DS) were observed between both groups in the side branch (MLD: 1.34 ± 0.04 mm [Tryton] vs 1.45 ± 0.21 mm [SBBA], p = 0.09). No complete strut fractures were observed within the Tryton treated side branches.

CONCLUSIONS From this pre-specified angiographic 3D QCA and ultrasound sub-analysis, the use of the Tryton bare-metal stent did not negatively impact the outcomes of the main branch DES. Similar results were found regarding the 9-month MLA and MLD of the side branch between the Tryton group and the balloon angioplasty strategy. The IVUS SB analyzable subgroup however represents a relative small fraction of the intended study population and therefore selection bias may have occurred.

CATEGORIES IMAGING: Intravascular

TCT-346 Association between Increased Number of Septal Branches within the Myocardial Bridge and Abnormal Diastolic-Fractional Flow Reserve

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1Stanford University of Medicine, Stanford, CA

BACKGROUND Recent studies have demonstrated that myocardial bridge (MB) can be one of the causes of ischemic chest pain, presumably attributable to hemodynamic disturbance in the affected coronary artery. Diastolic-fractional flow reserve (d-FFR) is superior to routine hemodynamic measurements in predicting improvement of perfusion after treatment of MB. Myocardial hemodynamic disturbance related to MB occurs predominantly during dobutamine stress testing. However, the number of septal branches within the MB segment is currently unknown. This study aimed to investigate the number of septal branches associated with altered MB-related d-FFR.

METHODS In 86 symptomatic MB patients with no significant obstructive epicardial stenosis, IVUS and d-FFR were evaluated in the left anterior descending arteries. MB was defined by IVUS as an echoluscent muscle band (halo) partially surrounding the artery. In addition to minimal lumen area (MLA), MB-related IVUS parameters were assessed including total MB-length, the number of septal branches within the MB segment, arterial compression (% decrease in vessel area at systole), and halo (MB) thickness. Using a coronary pressure wire, d-FFR was measured at rest and during dobutamine challenge within and distal to MB. Abnormal d-FFR value was defined as <0.76 during dobutamine challenge within or distal to MB.

RESULTS Among the MB-related parameters, the number of septal branches within the MB (r = 0.314, p = 0.0032) and MB length (r = 0.245, p = 0.0229) significantly correlated with d-FFR values with dobutamine challenge, while arterial compression weakly correlated with d-FFR at rest (r = 0.268, p = 0.0209) (Figure). MLA and halo thickness were not significantly related to d-FFR during dobutamine challenge or at rest. Overall, abnormal d-FFR was found in 88% of the study patients. Stepwise multiple regression analysis revealed that the increased number of septal branches within the MB was independently associated with abnormal d-FFR values (r = 0.314, p = 0.0032) among all the MB-related IVUS parameters studied.

CONCLUSIONS In patients with symptomatic MB, greater involvement of septal branches in the MB segment appears to lead to more hemodynamic disturbance during diastole, presumably accounting for heterogeneous presentation of dynamic ischemia among the MB patients. Detailed analysis of MB-related anatomic and functional assessments may enhance our understanding of the exact role of MB in angina patients with no significant obstructive epicardial stenosis.