(PCI) using a drug-eluting stent. A pre-specified grayscale and virtual histology (VH) intravascular ultrasound (IVUS) sub-study enrolled 2064 pts.

**Methods:** Pre-PCI grayscale and VH-IVUS images from 916 culprit lesions in 773 pts were assessed to determine the underlying morphology. Lesions were compared between males (n=582) vs females (n=191) in two age groups (< 65 years and ≥ 65 years) and included plaque rupture, attenuated plaque, and VH-IVUS thin cap fibroatheroma (TCFA).

**Results:** Culprit lesion plaque ruptures were more common in males than in females overall [254/699 (36.3%) in males vs 50/2017 (23.0%) in females, p<0.001] and in younger pts [159/379 (42.0%) in males vs 15/79 (19.0%) in females, p=0.04], but not in older pts (Table). A similar pattern was seen in VH-TCFAs, both overall [373/917 (41.3%) in males vs 97/217 (44.7%) in females, p=0.02] and in younger pts [204/379 (54.0%) in males vs 31/79 (39.0%) in females, p=0.04], but again not in older pts. Multivariate analysis showed that male gender was an independent predictor for plaque rupture (OR:1.85 [1.26, 2.71], p=0.0017) in addition to pre-PCI diameter stenosis [OR: 1.87 (1.57, 2.23) per 10%, p<0.0001], body mass index [OR: 1.05 (1.01, 1.08), 0.005], ST-elevation myocardial infarction [OR: 1.45 (0.99, 2.13), p=0.06], and current smoking [OR: 1.37 (0.99, 1.90), p=0.06].

**Conclusions:** There was a difference in the frequency of unstable plaque morphology in culprit lesions between male and female pts in young pts; younger male pts had more unstable plaques (plaque ruptures and VH-TCFAs) than younger female pts. However, this difference was not seen in older pts.

**TCT-671**

**Relationship Between Plaque Morphologies And Clinical Presentation In The ADAPT-DES IVUS Substudy**

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**Background:** ADAPT-DES study was a prospective multicenter, registry of 8,583 consecutive stable and unstable pts undergoing percutaneous coronary intervention (PCI) using a drug-eluting stent. A pre-specified grayscale and virtual histology (VH) intravascular ultrasound (IVUS) sub-study enrolled 2064 pts.

**Methods:** Pre-PCI imaging of 773 pts identified 907 culprit lesions. The relationship between lesion morphology and clinical presentation was compared among pts with (1) ST-segment elevation myocardial infarction (STEMI), (2) non-STEMI (NSTEMI) and unstable angina (UA), and (3) stable CAD.

**Results:** IVUS identified plaque ruptures in 52.1% of STEMI, 33.9% or NSTEMI/UA, and 22.8% of stable CAD. In addition to more plaque ruptures, culprit lesions in STEMI pts had thin-cap fibroatheromas (TCFA); conversely, thromboatheromas were more often calcified (>10% dense calcium) with thick fibrous caps (ThCFA) in stable CAD (Table). Minimum lumen area (MLA) was smaller with more plaque burden and positive remodeling in STEMI lesions compared to NSTEMI/UA and stable CAD. In multivariate analyses, BL plaque burden and positive remodeling in STEMI lesions compared to NSTEMI/UA or stable CAD presentation. Among lesions with plaque rupture, only plaque burden (85%) predicted STEMI presentation.

**TCT-670**

**Impact of Intravascular Ultrasound Tissue Characterization, in Addition to Plaque Burden and Local Endothelial Shear Stress, on the Prediction of New Adverse Cardiac Events in Humans**

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**Background:** The PREDICTION study indicated that large plaque burden and local endothelial shear stress (ESS) independently predict plaques that develop progressive enlargement and worsening lumen narrowing. The purpose of this study was to evaluate whether plaque components identified by intravascular ultrasound (IVUS) and iMAP provide additional predictive insight.

**Methods:** The PREDICTION study was designed to assess plaque natural history (IVUS) and iMAP provide additional predictive insight.

**Results:** There was a difference in the frequency of unstable plaque morphology in culprit lesions between male and female pts in young pts; younger male pts had more unstable plaques (plaque ruptures and VH-TCFAs) than younger female pts. However, this difference was not seen in older pts.

**Table. IVUS findings in culprit lesions between male and female pts in different age groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male (N=379)</th>
<th>Female (N=179)</th>
<th>p-value</th>
<th>Male (N=320)</th>
<th>Female (N=138)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque rupture</td>
<td>42% (199)</td>
<td>19% (35)</td>
<td>0.0007</td>
<td>30% (95)</td>
<td>25% (35)</td>
<td>0.35</td>
</tr>
<tr>
<td>Attenuated plaque</td>
<td>57% (215)</td>
<td>58% (46)</td>
<td>0.85</td>
<td>68% (219)</td>
<td>67% (92)</td>
<td>0.86</td>
</tr>
<tr>
<td>TCFA</td>
<td>54% (204)</td>
<td>39% (66)</td>
<td>0.04</td>
<td>53% (161)</td>
<td>48% (66)</td>
<td>0.39</td>
</tr>
<tr>
<td>MLA (mm²)</td>
<td>2.9 (2.8, 3.0)</td>
<td>2.7 (2.5, 2.9)</td>
<td>0.08</td>
<td>2.9 (2.8, 3.0)</td>
<td>2.8 (2.6, 3.0)</td>
<td>0.69</td>
</tr>
<tr>
<td>Vessel area (%)</td>
<td>14.4 (13.7, 15.0)</td>
<td>11.3 (10.3, 12.3)</td>
<td>&lt;0.001</td>
<td>13.9 (13.2, 14.6)</td>
<td>11.8 (11.0, 12.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>MLA (mm²)</td>
<td>76.5 (75.4, 77.4)</td>
<td>72.6 (69.7, 75.4)</td>
<td>0.01</td>
<td>76.4 (75.2, 77.4)</td>
<td>73.6 (71.8, 76.4)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Conclusions:** There was a difference in the frequency of unstable plaque morphology in culprit lesions between male and female pts in young pts; younger male pts had more unstable plaques (plaque ruptures and VH-TCFAs) than younger female pts. However, this difference was not seen in older pts.

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JACC Vol 62/18/Suppl B | October 27–November 1, 2013 | TCT Abstracts/POSTER/Intravascular Imaging and Coronary Artery Disease | B205