Conclusions: BLEEDRS – an adapted simplification of HASBLED score predicts major bleeding events after PCI.

TCT-555
Release of Bioactive Lipids During Percutaneous Coronary, and Peripheral Arterial Interventions in Humans: Lipidomic analysis of Distal Embolic Protection Devices
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Background: Oxidation of lipoproteins generates multiple bioactive oxidized lipids that affect atherothrombosis and endothelial dysfunction, but direct evidence of their role during therapeutic procedures is lacking. Liberated oxidized lipids may result in no-reflow phenomenon, myocardial infarction and stroke. To assess whether oxidized vasoactive lipids are released downstream from atherosclerotic plaques following percutaneous coronary and peripheral interventions we undertook a lipidomic analysis of material recovered from distal embolic protection devices from different vascular beds.

Methods: The presence of specific oxidized lipids was assessed in embolized material captured by distal embolic protection devices during saphenous vein graft, carotid, renal, and superficial femoral artery interventions. Following lipid extraction, specific oxidized phospholipids (OxPL) and cholesterol esters (OxCE) were quantified in 12 filters using liquid chromatography, tandem mass spectrometry.

Results: Phosphatidylcholine (PC) containing OxPL, including 1-palmitoyl-2-(5-ofoxovaleryl)-sn-glycerol-3-phosphocholine (POPC), C9 aldehyde PC, E2 and F2 iso-prostanate PC, and hydroprostacyc PC were identified in the extracted lipid portion. The major oxidized PC by mass was the C9 aldehyde PC, representing 38% of all oxidized PL. Several species of OxCE, such as aldehyde, hydroperoxide, oxide and epoxy cholesterol ester derivatives from cholesteryl linoleate and cholesteryl arachidonate, were also present. The pattern of OxPL and OxCE within filters correlated well with molecules found in various forms of oxidized LDL and did not differ significantly in different vascular beds. The presence of OxPL was also confirmed using ELISA and immunohistochemistry.

Conclusions: This is the first documentation of the presence and direct release of oxidized lipids from atherosclerotic plaques during percutaneous interventions from multiple vascular beds in humans. The release of such oxidized lipids into the microcirculation may mediate some of the adverse clinical outcomes that result during these intravascular interventions.

TCT-556
The Incidence and outcome of devices "stuck" in the coronary artery during percutaneous coronary intervention - A Toyohashi Experience -
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Background: An intra-coronary device becoming “stuck” is a very uncommon complication that may lead to tragic consequences such as occlusion of the artery and systemic embolism.

Methods: Of 14,198 lesions in 13,188 patients who underwent PCI between 1999 and 2011, 40 “device stuck” (0.28%) incidents occurred during PCI procedures. The incidence, outcomes and management of these “device stuck” occurrences were evaluated.

Results: The overall procedural success rate was 97.8% (13,884/14,198). The stuck devices included stents (n=20; 50%), wires (n=14; 35%), balloons (n=4; 10%), intra-vascular ultrasound (n=1; 2.5%), and rotablator burns (n=1; 2.5%), respectively. Management of the complication and acute/long-term outcomes are shown in the table. Of 54 instances of “device stuck,” 15 (35.7%) were retrieved successfully, and 7 (18%) resulted in rupture and were left in the coronary artery. Thirty-seven patients recovered in the cath-lab and the rest (N=7) were referred to emergency CABG. At 1-year follow-up, all patients were alive, although the segment of the coronary artery where the “device stuck” occurred was occluded in 2 cases on angiographic findings.

Conclusions: Although the rate of this complication during PCI was very low, all cases were solved with optimal treatment and all patients survived at 1-year follow-up. A safe procedure with careful device manipulation should be required for PCI, with appropriate management leading to better outcomes.

TCT-557
The Risk of In-Hospital Bleeding and Long-Term Mortality in Patients with ST Elevation Myocardial Infarction Treated with Primary Percutaneous Coronary Intervention
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Background: Recent advances in antithrombotic therapy for STEMI are accompanied by an increased risk of bleeding. So far, the CRUSADE score for bleeding risk has only been validated in NSTEMI.

Methods: The risk of in-hospital major CRUSADE bleeding and 1-year mortality after primary PCI for STEMI was studied in consecutive patients who received upfront abciximab, periprocedural heparin and loading doses of aspirin and clopidogrel.

Results: In total, 965 STEMI patients (61;12 yrs, 76%; men) were stratified according to the CRUSADE bleeding risk score categories. Median CRUSADE score was 21 (14-29). Bleeding was common (21%) ranging from 11% in the very low risk group up to 69% in the very high risk group. Most common bleeding site was the femoral access site. In 3 patients, bleeding most likely led to death. Survival analysis demonstrated 1-year mortality rates of 9.2% in bleeders vs. 2.5% in non-bleeders (p<0.001, Figure). Assessment of the CRUSADE score risk by ROC curve resulted in an area under the curve of only 0.68 (0.64-0.73, p<0.001).

CRUSADE bleeding risk score

<table>
<thead>
<tr>
<th>Category</th>
<th>Non-bleeders</th>
<th>Bleeders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low risk</td>
<td>399 (88.9%)</td>
<td>50 (21.1%)</td>
</tr>
<tr>
<td>Low risk</td>
<td>230 (75.9%)</td>
<td>73 (24.1%)</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>95 (69.3%)</td>
<td>42 (30.7%)</td>
</tr>
<tr>
<td>High risk</td>
<td>39 (65.0%)</td>
<td>21 (35.0%)</td>
</tr>
<tr>
<td>Very high risk</td>
<td>5 (31.3%)</td>
<td>11 (68.8%)</td>
</tr>
</tbody>
</table>

In-hospital major bleeding in CRUSADE bleeding risk score categories

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Conclusions: Major bleeding is common after primary PCI for STEMI and associated with increased mortality during 1 year follow-up. The CRUSADE bleeding risk score underestimated the risk of major bleeding and therefore the use of this tool might be limited in STEMI.

TCT-558
Red Cell Distribution Width As A Correlate Of Post-Percutaneous Intervention Bleeds
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Background: Red cell distribution width (RDW), a numerical measure of the variability of the size of circulating erythrocytes, has been shown to be an independent predictor of mortality in cardiovascular disease, and in patients undergoing PCI. The purpose of this study was to determine if RDW is a prognostic marker of major post-PCI bleeding.

Methods: The study population included 4387 patients with coronary artery disease who were subjected to PCI. The RDW was derived from a complete blood count (CBC) drawn before PCI. Major bleeding was defined as hematocrit decrease ≥15%, transfusion of ≥2 units of packed red blood cells, gastrointestinal or intracerebral bleeding. Multivariable logistic analysis of major in-hospital bleeding was performed using a logistic regression model. Baseline characteristics associated with bleeding were included in the model.

Results: In 250 patients with a bleed, RDW was significantly higher than in the 4137 patients who did not bleed (14.4 +/- 2.1% vs 13.5 +/- 1.6%, p < 0.001). On multivariable analysis, after adjustment for known correlates of bleeding, RDW was a significant predictor of bleeding (OR 1.14, 95% CI 1.05-1.23, p=0.002). (Table 1)

Conclusions: RDW, an easily obtainable marker, has a strong independent linear relationship with major post-procedure bleeding in patients undergoing PCI. These data suggest that further investigation is necessary to determine the relationship of RDW and bleeding post-PCI.

TCT-559
On-Treatment Platelet Reactivity Testing Before Coronary Artery Bypass Surgery. Does It Predict In-Hospital Major Bleeding?
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Background: Consensus guidelines recommend discontinuation of thienopyridine therapy 5-7 days before planned coronary artery bypass graft (CABG) surgery to reduce bleeding-related events. However, surgery is often performed within this time period to reduce the risk of ischemic events. Evidence supporting the use of on-treatment platelet reactivity testing before CABG is limited.

Methods: Patients undergoing CABG within 5 days of thienopyridine discontinuation were prospectively enrolled from 08/2010 to 02/2012. On-treatment platelet reactivity was measured with Verify Now (VN) P2Y12 assay, vasodilator stimulated phosphoprotein phosphorylation (VASP) and light transmittance aggregometry (LTA) with 5 and 20 μM of ADP. The primary end point was in-hospital major bleeding (IHMB), defined as bleeding intracranially, that associated with hemodynamic compromise, a hemoglobin drop of >5 g/dl, or a hematocrit drop of >15%. The relation between platelet reactivity value and IHMB was assessed with Wilcoxon rank-sum test; its relation with hematocrit (Htc) drop was evaluated with Spearman correlation.

Results: The population consisted of 80 patients. IHMB occurred in 37 patients (46.3%). VASP and LTA with 5 μM or 20 μM of ADP were associated with the primary endpoint (IHMB). (Table) VN and VASP levels demonstrated an inverse correlation with the degree of Htc drop after CABG (p=0.002 and 0.041, respectively). A VASP platelet reactivity index (PRI) of 50% is predictive of IHMB (p=0.013), but a cut-off value of 230 P2Y12 reaction units (PRU) for VN is not (p=0.26). Surgical related bleeding is not predicted by platelet reactivity testing.

TCT-560
Impact of Intra-Procedural Coronary No Reflow on 2 year Clinical Outcomes following Percutaneous Coronary Intervention with Drug-eluting Stents
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Background: Coronary no reflow is infrequent complications during percutaneous coronary intervention (PCI), however its impact on long term clinical outcome is not well studied.

Methods: A total 1926 all comer patients (pts) including acute myocardial infarction (MI) pts who underwent PCI with DESs were enrolled for this study. Study population was divided into two groups; 'no reflow' group (n=50 pts) and non 'no reflow' group (n=1876 pts). Angiographic at 6 months and clinical outcomes up to 24 months were compared between the two groups.

Results: Baseline characteristics were similar between the two groups. The incidence of angiographic no-reflow was in 2.6% (50/1926). At 6 months, "no reflow" group had more incidences of higher late loss. At 24 months clinical follow up, the "no-reflow" group had worse clinical outcomes including higher cumulative incidence of total death, Q-MI and major adverse cardiac events (MACEs, Table).

Conclusions: In the current study, despite of low incidence of "no-reflow" in general PCI population, those patients had worse angiographic and clinical outcomes up to 24 months. Special care should be exercised in this particular subset of pts during and after the procedure.