The Impact of Vascular Access for In-Hospital Major Bleeding in Acute Coronary Syndrome Patients with Moderate- to Very High Bleeding Risk

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Background: The aim of our study was to determine the impact of vascular access on in-hospital major bleeding (IHMB), particularly in acute coronary syndrome (ACS) patients with moderate- to very high-bleeding risk.

Methods: We analyzed 995 ACS patients with the Can Rapid risk stratification of Unstable angina patients Suppress ADverse outcomes with Early implementation of the ACC/AHA guidelines (CRUSADE) moderate- to very high-bleeding risk scores in trans-radial intervention (TRI) retrospective registry from 16 centers in Korea. 402 patients received TRI (TRI group) and 593 patients trans-femoral intervention (TFI group). The Primary end-point was IHMB as defined in the CRUSADE.

Results: The use of 600mg loading dose of clopidogrel and low molecular weight heparin were more common in TRI, however, the use of unfractionated heparin and glycoprotein IIb/IIIa inhibitors were more common and hematocrit, creatinine clearance, blood pressure and heart rate at admission were lower in TFI. TRI had lower incidences of IHMB and blood transfusion than TFI (6.0% vs. 9.4%, p=0.048; 4.5% vs. 9.4%, p=0.003). The patients suffered from IHMB had higher incidences of in-hospital and 1-year mortality than those free from IHMB (31.8% vs. 15.0%, p<0.001; 7.2% vs. 30.0%, p<0.001). TRI was an independent predictor of IHMB (odds ratio: 0.305; 95% confidence interval: 0.109-0.851; p=0.003).

Conclusions: IHMB is still significantly correlated with in-hospital and 1-year mortality. Our study suggests that compared to TFI, TRI could reduce IHMB in ACS with the moderate- to very high-bleeding risk.

One-Year Cardiovascular and Renal Outcome of Sodium Bicarbonate in Comparison with Saline for Prevention of Contrast-Induced Nephropathy After Cardiac Catheterization A Randomized Control Trial

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Background: Contrast-induced nephropathy (CIN) is the major cause of hospital-acquired renal failure. Although the efficacy of sodium bicarbonate to prevent CIN was reported, long-term cardiovascular and renal outcome is unclear.

Methods: Between May 2006 and March 2010, 161 patients of multicenter with CKD (Scr ≥1.2 mg/dl) who underwent cardiac catheterization were prospectively randomized to receive short infusion of sodium bicarbonate (n=80, 3ml/kg/h for 1h before, then 1ml/kg/h for 6h after procedure) or long infusion of 0.9% saline (n=81, 1ml/kg/h for 12h before and for 12h after procedure). Primary endpoint is the incidence of CIN defined increase Scr more than 0.5mg/dl or 25% within 48 hours after procedure. Secondary endpoint was cardiovascular and renal outcome 1 year after procedure.

Results: Two groups were well matched for baseline characteristics without age, hypertension. The incidence of CIN was not different between 2 group (bicarbonate 8.8% vs saline 2.5%, p=0.10). One-year follow-up was completed with 124 patients (95%). The change of %Cr and estimated GFR were not different in two groups (Cr 0.20±0.62 mg/dl vs 0.25±0.63 mg/dl, p=0.67 ; eGFR -2.7±8.8 vs -4.8±8.1 p=0.12). No significant difference was observed in two groups about the composite cardiovascular event and the composite renal event.

Conclusions: Short infusion of sodium bicarbonate has almost similar effects on incidence of CIN and long-term cardiovascular and renal outcome compared with the standard saline infusion.

Post-procedure Major Bleeding Events in Patients Undergoing Percutaneous Coronary Intervention: Validation of BLEEDRS-A Simplified HAS-BLED Score

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Background: HAS-BLED score predicts bleeding risk in patients with atrial fibrillation. We have simplified the risk score and assessed its validity in a contemporary cohort of patients who underwent percutaneous coronary intervention (PCI).

Methods: The study included 1851 consecutive patients undergoing PCI between January 2010 and March 2012. We simplified the HAS-BLED score to BLEEDRS score using routinely collected variables (Bleeding history, Low hemoglobin, Elderly, Elevated BP, Drugs, Renal disease, Stroke). We assessed major bleeding events as per NCDR definition.

Results: The median patient age was 65 years and 66% were male. Transfemoral access was used in 83% and primary PCI was performed in 24.4% of the patients. Peri-procedural antplatelet and anticoagulation therapy included aspirin(97%), clopidogrel(57%), prasugrel(5%), bivalirudin(32%), enoxaparin(9%), GPIIb/IIIa inhibitor(21%) and heparin(52%). The median BLEEDRS score was 2(0-6). We divided the patients into tertiles: BLEEDRS (1)score ≤2; BLEEDRS (2)score >2 and ≤3; BLEEDRS (3)score ≥4.5.1% of the entire cohort of patients developed in-hospital bleeding events, 1.7% in BLEEDRS (1), 9.6% in BLEEDRS (2), and 20% in BLEEDRS (3)(P<0.0001). The BLEEDRS levels were an independent determinant of bleeding after adjusting for gender, antiplatelet and anticoagulation agents (P<0.05). The calibration of the BLEEDRS score was good (Hosmer-Lemeshow, P>0.5), and its discriminatory capacity was acceptable, with an area under the ROC curve of 0.75 (95% CI 0.71-0.79) (Figure-1).
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, coronary and peripheral interventions we undertook a lipidomic analysis of material recovered from distal embolic protection devices from different vascular beds.

Results: Phosphatidylcholine (PC) containing OxPL, including 1-palmitoyl-2-(5-oxovaleryl)-sn-glycero-3-phosphocholine (POVPC), C9 aldehyde PC, E2 and F2 isoprostane PC, and hydroperoxy 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.

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 intracoronary 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 burrs (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 (37.5%) 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=3) 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.

Background:

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

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 (Table). 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 risk score by ROC curve resulted in an area under the curve of only 0.68 (0.64-0.73, p<0.001).

<table>
<thead>
<tr>
<th>CRUSADE bleeding risk score</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