TCT-629
Comparison of Optical Coherence Tomography and Histopathology Findings Following Paclitaxel-Coating Balloon in Porcine In-stent Stenosis Model
Arthiro Samuli1, Alexander Nikanorov1, Toshiro Shinke1, Jinsheng Li1, Jaipal Singh1, Spencer King2, Nicolas Chronos3, Dongming Hou1,2
1STIRI, Atlanta, GA; 2ABBOTT Vascular, Santa Clara, CA, CA

Background: Paclitaxel-Coating balloon (PCB) has shown efficacy for treatment of coronary artery disease. Optical coherence tomography (OCT) is a promising endovascular imaging devise and has been reported to have a high correlation with histomorphometric measurement. However, the association of in-stent stenosis (ISR) by OCT and histopathology response is still not fully addressed. The current study was designed to compare the OCT and histopathological findings following PCB treatment in a porcine ISR model.

Methods: Thirty-two coronary arteries (LAD: n=12, LCX: n=11, RCA: n=9) of 24 Yorkshire pigs were assigned to two (2) groups randomly. PCB (SeQuant, length 20mm, n=16) or non-coating balloon (NCB, length 20mm n=16) were inflated for 60 seconds with B:A 1.2:1 followed by BMS (length 12mm) implantation (S/A 1.5:1) within the target region. At 28 days, animals underwent OCT and histopathology evaluation.

Results: There were no significant differences between groups among parameters measured by OCT. The thickness of neointimal hyperplasia on stent strut and the percent of ISR were 585 ± 277 μm, 46.8 ± 19.0 % for PCB, and 661 ± 237 μm, 52.4 ± 15.3 % for NCB (p=NS, respectively). However, inflammation (PIEB: 2.04 ± 0.84, PCB: 2.27 ± 1.18, p=0.003) and fibrin deposition scores (PCB: 2.31 ± 0.93, NCB: 0.81 ± 0.86, p=0.001) were significantly higher in PCB compared to NCB. The OCT ISR% was positively correlated with inflammation score (PCB: r=0.62, and NCB: r=0.85; p<0.05 respectively). Interestingly, fibrin deposition score only in PCB was negatively correlated with the OCT ISR% (r=0.68, p=0.005). OCT also showed an uncovered (33.3%) and insufficient non-uniformed neointima (13.3%) in PCB group (p=0.008 vs NCB).

Conclusion: OCT can be used as a valuable imaging tool to evaluate vessel wall histopathological changes in vivo. The higher inflammation and fibrin deposition scores in PCB may indicate a delayed healing response in the current experimental setting.

TCT-630
Does measurement of serum 1,5-anhydroglucitol (1,5-AG) level be able to predict the presence of coronary plaque?
Suguru Murase, Osamu Matsuda, Akira Murata, Yoriyasu Suzuki, Tatsuya Fukutomi, Tetsuo Matsubara
Nagoya heart center, Nagoya, Japan

Background: The postprandial hyperglycemia is well known as one of therisk factors for cardiovascular disease. Serum 1,5-Anhydroglucitol (1,5-AG) is a useful clinical marker for short-term glycemic status and postprandial hyperglycemia. We examined whether serum 1,5-AG level can predict the presence of coronary plaque.

Methods: We investigated the relationship between serum 1,5-AG level and coronary plaque in 513 consecutive patients evaluated by 128-slice CT. In those patients, 126 cases have taken coronary artery angiography (CAG). We compared the presence of coronary plaque by MSCT and Syntax score of patients with CAG between patients with 1,5-AG level less than 14 μg/ml and over 14 μg/ml.

Results: Measurement of serum 1,5-AG level might help to diagnose the presence of coronary artery plaque in routine clinical practice.

TCT-631
Correlation between modification in plaque composition and changes in vascular geometry at the edges of bare metal and drug-eluting stents
Jose De Ribamar Costa, Alexandre Abizaid, Dmytry Siqueira, Daniel Charmie, Ricardo Costa, Rodrigo Saito, Fausto Perea, Amanda Sousa, J Eduardo Sousa
Interventional Cardiology, Instituto Dante Fazzanese / HCOR, Sao Paulo, Brazil

Background: To the present, little is known about the correlation between modifications in plaque composition at stent edges and the changes in vessel geometry. This study sought to evaluate, by serial grey-scale intravascular ultrasound (IVUS) and Virtual Histology™, the modifications in plaque composition at the edges of drug-eluting (DES) and bare-metal stents (BMS) and the correlation of these findings with changes in the measuremntes of vessel, lumen and plaque area at those segments.

Methods: Single-center, prospective and randomized (1:1) evaluation of 40 patients with acute coronary syndrome treated with BMS (Driver, n=20 patients) or DES (Cypher, n=20 patients). Following stent deployment, all individuals underwent gray scale IVUS and Virtual Histology™ evaluation, which were repeated at nine months. Primary endpoint was the modification in vessel, lumen and plaque area and in the composition of the plaque in the mean time between the baseline and follow-up procedure. Additionally, we sought to correlate the variation in plaque composition and changes in vessel geometry.

Results: Baseline clinical and angiographic characteristics did not differ between groups. At the proximal edge of DES and BMS there was a trend to positive vessel remodeling which compensated the modest increase in plaque area. At the distal edge, patients treated with DES had less plaque growth resulting in a larger lumen area at follow-up. By Virtual Histology, there was a marked reduction in the % of fibrotic tissue and necrotic core in both edges of the two stents and a positive, strong correlation was seen between increase in % of fibroticity component and augmentation in plaque area (r=0.78, p<0.01).

Conclusion: The use of DES was not associated with “edge effect”. On the contrary, patients treated with these devices experienced less plaque growth, especially at the distal edge of the stents. Modifications in plaque composition, with increase in fibrotic content, might partially explain these findings.

TCT-632
Impact of Stent Platform of Paclitaxel-eluting Stents: Detailed Assessment of Neointimal Distribution by Optical Coherence Tomography
Hironaka Otahe, Toshiro Shinke, Junya Shite, Masayuki Nakagawa, Ryozo Nagoshi, Taisyou Otake, Ken-ichi Hirasata
Kobe University Graduate School of Medicine, Kobe, Japan

Background: TAXUS Express™ paclitaxel-eluting stent (PES) and TAXUS Liberti™ PES consist of the same drug, drug dose, and polymer, but have different stent platforms. TAXUS Liberti™ PES has a thinner strut stent platform specifically designed for more uniform drug elution. The aim of this study was to assess the impact of stent design and strut thickness on vessel healing after PES deployment.

Methods: Fifty-four patients who underwent 6-month follow-up optical coherence tomography (OCT) after TAXUS Express™ (n=27) or TAXUS Liberti™ PES (n=27) implantation were enrolled. In addition to standard OCT variables, longitudinal and circumferential uniformity of neointimal distribution was evaluated in 3-dimensions by computing mean neointimal thickness (NIT) within 360 equally-spaced radial sectors for every 1-mm cross-section along the stented segment. The incidence of stents with a peri-strut low intensity area (PLIA), a finding suggestive of delayed arterial healing, was also evaluated.

Results: TAXUS Liberti™ PES had a significantly thinner mean NIT than the TAXUS Express™ PES with comparable frequency of uncovered struts. Longitudinal and circumferential absolute variation of NIT expressed by standard deviation of NIT calculated from each sector was significantly smaller for the TAXUS Liberti™ PES. TAXUS Express™ PES had a tendency toward a decreased incidence of thrombus and struts with PLIA than the TAXUS Express™ PES.

Comparisons between TAXUS Liberti™ PES vs. TAXUS Express™ PES

Conclusion: Stent design and thickness appeared to impact vessel healing of PES. The stent platform of TAXUS Liberti™ PES may offer greater and more homogeneous neointima suppression in patients treated with PES.