

## Late Breaking Clinical Trials

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(Abstracts nos. AS-001–AS-005)

### AS-001

#### Zilver PTX Randomized Trial of Paclitaxel-Eluting Stents for Femoropopliteal Artery Disease: 24-Month Update.

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**Background:** The Zilver® PTX® stent with polymer-free paclitaxel coating is the first drug-eluting stent approved (currently CE marked, investigational in the United States and Japan) for the superficial femoral artery (SFA). This multicenter, multinational, prospective, randomized trial compared the safety and effectiveness of the Zilver PTX study to balloon angioplasty (PTA) and bare metal stenting (BMS).

**Methods:** Symptomatic patients with SFA lesions (de novo or non-instant restenosis) were randomized to PTA or Zilver PTX stent placement. PTA patients experiencing acute failure (e.g. > 30% residual stenosis) underwent secondary randomization to provisional stenting with Zilver BMS or Zilver PTX. Follow-up included event-free survival (EFS), and primary patency by Duplex ultrasound core laboratory analysis (peak systolic velocity ratio < 2.0).

**Results:** 479 patients were enrolled at 55 institutions in the United States, Japan and Germany, with 241 patients randomized to the Zilver PTX group and 238 to the PTA group. Demographics and lesion characteristics (e.g., lesion length 66 mm and 63 mm, respectively) were similar for the groups. Approximately half the PTA group experienced acute failure and underwent secondary randomization; 59 and 61 patients were assigned to provisional stenting with Zilver BMS and Zilver PTX, respectively.

The study results met the 12-month primary endpoint goals showing non-inferior EFS (90.4% versus 82.6%,  $p < 0.01$ ) and superior primary patency (83.1% and 32.8%,  $p < 0.01$ ) for the Zilver PTX compared to PTA. The randomized comparison of provisional stenting with Zilver PTX versus Zilver BMS also showed significant paclitaxel coating benefit, with 12-month patency rates of 89.9% and 73.0% respectively ( $p = 0.01$ ).

Currently, 24-month follow-up is available for 278 patients, showing an 86.6% EFS rate and a 74.8% patency rate. The randomized comparison of provisional stenting with Zilver PTX versus Zilver BMS continues to demonstrate significant paclitaxel coating benefit at 24 months, with patency rates of 81.2% and 62.7% respectively ( $p < 0.01$ ).

**Conclusion:** The results of this randomized, multicenter study support the safety and effectiveness of the Zilver PTX Drug-Eluting Peripheral Stent.

### AS-002

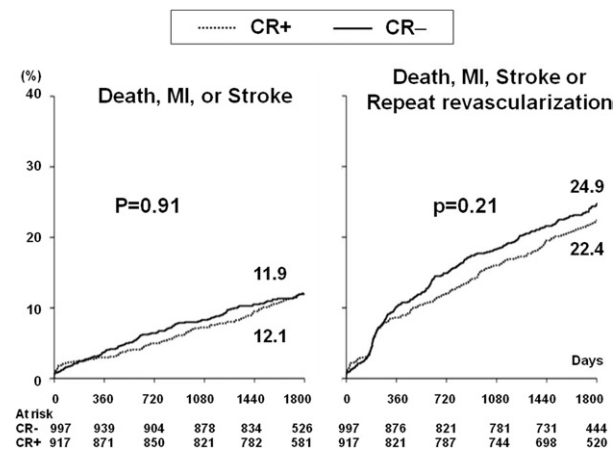
#### Impact of Angiographic Complete Revascularization after Drug-Eluting Stent Implantation or Coronary Artery Bypass Surgery for Multivessel Coronary Disease.

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**Background:** This study was aimed to evaluate the clinical impact of angiographic complete revascularization (CR) after drug-eluting stent (DES) implantation or coronary artery bypass graft (CABG) surgery for multivessel coronary disease

**Methods:** Consecutive 1914 patients with multivessel coronary disease received DES (1400 patients) or CABG (514 patients). Angiographic CR was defined as complete revascularization in all diseased segments according to the SYNTAX classification.

**Results:** Angiographic CR was performed in 917 (47.9%) patients comprising 573 (40.9%) PCI and 344 (66.9%) CABG patients. CR patients were younger and had less extensive coronary disease than non-CR patients. For 5 years, CR patients had comparable incidences of death (hazard ratio [HR], 1.04; 95% confidence interval [CI], 0.76-1.43; adjusted  $p=0.81$ ) and composite of death, myocardial infarction (MI), and stroke (HR, 1.04; 95% CI, 0.79-1.36; adjusted  $p=0.80$ ), and composite of death, MI, stroke and repeat revascularization (HR, 0.91; 95% CI, 0.75-1.10; adjusted  $p=0.32$ ) compared with non-CR patients. The pattern of hazard between CR and non-CR patients was not different in the PCI and CABG subgroups.



**Conclusion:** Angiographic CR with either DES or CABG did not improve the long-term outcomes in patients having multivessel disease. This finding supports the strategy of ischemia-guided revascularization for coronary disease.

### AS-003

#### Moving Towards Biomimicry-Development of Novel BioMime™ Sirolimus Eluting Coronary Stent System.

*Ashok Seth, Fortis Group of Hospitals, New Delhi, India.*

**Background:** The BioMime™ sirolimus-eluting coronary stent is a new step towards a biomimicry concept. The stent is built on an ultra-low strut thickness (65µm) cobalt-chromium stent platform using an intelligent hybrid of closed and open cells allowing for morphology mediated expansion, and employs a well-known antiproliferative – sirolimus – that elutes from a known biodegradable co-polymer formulation in 30 days. The resultant stent demonstrates almost 100% endothelialisation at 30 days in pre-clinical models. In its first in man (meriT-1) trial, BioMime reports an excellent in-stent median late luminal loss of 0.15mm with 0% MACE and no stent thrombosis defining its safety and efficacy parameters. Prompted by these results, we conducted the BioMime 1 (meriT-2) trial which is a multi-centric trial and patients are real world who receive DES in routine clinical practice.

**Methods:** The BioMime 1 trial was a single arm, multi-centre trial done in 12 Indian centres to evaluate safety and efficacy of BioMime

SES in 250 patients with native coronary arteries presenting with stable or acute coronary syndromes. The primary safety end-point of the trial was to study major adverse cardiac event (MACE) at 30 days while the primary efficacy endpoint was to assess the in-stent late lumen loss at 8 months by coronary angiography with QCA method. Secondary safety and efficacy endpoints included MACE at long term follow-up of 1, 2, 3 and 5 years and angiographic binary restenosis at 8 months angiographic follow-up by QCA method. Analysis was by intention to treat. Other end-points included studying the occurrence of stent thrombosis at acute, sub-acute, late & very late periods and % diameter stenosis by QCA method. The trial is registered with Clinical Trials Registry – India (REFCTRI-2009 000505, 03-07-2009).

**Results:** 182/250 patients have been treated so far. At 30-days, 0% MACE (major adverse cardiac events) was observed in 99% (180/182) patients followed up. and the median in-stent late luminal loss in initial 30 subjects studied by QCA method at 8 months angiography follow-up was 0.18mm. During follow-up no untoward adverse events have been observed thus far.

**Conclusion:** In comparison to its own first in man study wherein non-complex patients were studied the late lumen loss of (0.15mm versus 0.18mm) and MACE (0% versus 0%) are appreciably in concurrence especially knowing that in this study more complex patients were studied. BioMime Sirolimus eluting coronary stents appear to have considerable scientific basis for prevention of neointimal proliferation, restenosis and associated clinical events.

## AS-004

### Dynamic Change Of Wall Shear Stress After Stenting Bifurcation Lesions: Subgroup Analysis From DKCRUSH-II

**Trial.** *S. Chen<sup>1</sup>, C.M. Gibson<sup>2</sup>, J. Kan<sup>1</sup>, J.J. Zhang<sup>1</sup>, Z.Y. Hu<sup>1</sup>, H. Xu<sup>1</sup>, T. Xu<sup>1</sup>, F. Ye<sup>1</sup>, N.L. Tian<sup>1</sup>, J.X. Zhang<sup>1</sup>, Z.Z. Liu<sup>1</sup>.* <sup>1</sup>Nanjing First Hospital, Nanjing Medical University, Nanjing, China; <sup>2</sup>Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, USA.

**Background:** The present study aimed at investigating the hemodynamic change of vascular wall shear stress (WSS) in patients with coronary bifurcation lesions treated by double kissing crush (DK group) or One-stent with final kissing balloon inflation. WSS plays a critical role in the development of coronary bifurcation lesions. However, there is lack of data regarding the hemodynamic change of WSS after different stenting techniques for bifurcation lesions.

**Methods:** From our DKCRUSH-II study, eighty-one patients (48 in DK, 33 in One-stent group) having serial angiography (baseline, post-stenting and at-8-month follow-up) were included. 3-D model was reconstructed from the angiograms at end-diastolic stage of cardiac cycles. The whole vessel involved by bifurcation lesions was divided into: proximal main vessel (MV), distal main branch (MB), side branch (SB), polygon of confluence (POC, further into POC-MV, POC-MB and POC-SB). MB and SB were classified by internal- and lateral-subsegments, respectively. Turbulent index was defined as maximal minus minimal WSS value at the same site. Gradient of WSS was calculated as the difference of average WSS between two adjacent segments. Receiver operator curve (ROC) was used for the comparison of predictive value of variables for in-stent restenosis (ISR).

**Results:** The baseline magnitude of WSS in proximal MV, POC-MV, POC-MB, POC-SB and MB-internal segments increased signifi-

cantly, compared to MB-lateral (7.69-9.61 Pa), SB-internal (7.36-6.52 Pa) and SB-lateral (5.61-5.57 Pa, p all <0.001). Stent implantation was associated with significant reduction of WSS which sustained through the whole follow-up. DK crush stenting had potential of uniformly reducing WSS, turbulent index and WSS gradient. Turbulent index in SB-lateral and average WSS gradient between POC-SB minus SB-lateral had equal predictive value for ISR (95% CI -0.12-0.11, Z=-0.13, p=0.896).

**Conclusion:** Implantation of stent is associated with the significant reduction of WSS. Fluid dynamic results favor the use of DK crush over one-stent technique.

## AS-005

**Evaluation of Left Main Coronary Artery Revascularization by CT Angiography from PRECOMBAT Trial.** *Joon-Won Kang, Won-Jang Kim, Soo-Jin Kang, Duk-Woo Park, Tae-Hwan Lim, Seung-Jung Park.* Asan Medical Center, Seoul, Korea (Republic of).

**Background:** Conventional coronary angiography (CAG) is recommended 2 to 6 months after left main coronary artery (LM) stenting due to the unpredictable occurrence of in-stent restenosis (ISR). However, CAG for the LM stent has some risks and complications- some complications from the protrusion of the stent to the ascending aorta. Computed tomography coronary angiography (CTCA) is a promising technique for noninvasive coronary evaluation. We evaluated the diagnostic performance of high-resolution MSCT to detect ISR after stenting of the LM.

**Methods:** One hundred and forty-eight patients were prospectively identified from a patient population from PRE-COMBAT study underwent CTCA before scheduled for follow-up CAG after LM stenting. Among them, patients with time interval between CTCA and CAG within 1 month were included for analysis (n=48). Twenty-two patients had Cypher® stent and 26 had Xience® stent. From December 2009 until July 2010, a dual-source scanner which has 2 sets of 64 slice detector system was used for CTCA. Patients with initial heart rates >85 bpm received β-blockers.

**Results:** Diagnostic image quality was achieved from all the patients. MSCT correctly identified 3 patients with ISR (4 of 48) but misclassified 2 patients (1 false-positive and 1 false-negative). Overall, the accuracy of CTCA for detection of angiographic ISR was 95.8%. The sensitivity, specificity, and positive and negative predictive values were 75%, 97.7%, 75%, and 97.7%, respectively. One false positive was from the patient with Cypher® stent for the reason of beam-hardening artifact, and one false positive from the patient with Xience® stent for the reason of the small diameter of the distal segment of the stent. Twenty-seven of 48 LM stents were protruded to the ascending aorta. The length of the stent in the CT measurement was longer than in the intravascular ultrasound. For the assessment of stent diameter and area, MSCT showed good correlation with intravascular ultrasound, but the the cross-sectional area from CTCA was underestimated.

**Conclusion:** Current CT technology, CTCA allows reliable noninvasive evaluation of selected patients after LM stenting. CTCA is safe to exclude left main ISR and may therefore be an acceptable first-line alternative to CCA. Beam-hardening artifact can lead to false results. The diagnostic accuracy of CTCA will be higher with the technique of high-density CT and reducing the beam-hardening artifact.