P3945 | BENCH
Vascular response at proximal and distal edges between polymer-free and polymer-based paclitaxel-eluting stents: intravascular ultrasound analysis

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Aim: Polymer-based paclitaxel eluting stent (PB-PES) has shown to have a positive vascular remodeling at the distal edge compared to bare metal stent (BMS), probably due to higher downstream concentrations of the drug in comparison to proximal edge. The AXXION stent is a polymer-free paclitaxel eluting stent (PF-PES), whose dosage of drug is approximately 2.7 $\mu g/cm^2$ compared to 1.0 $\mu g/cm^2$ of the PB-PES. The purpose of this study was to compare vascular responses in adjacent segments between PF-PES and PB-PES.
Methods and results: Consecutive 164 patients undergoing percutaneous coronary intervention were prospectively randomized 1:1 to receive either PF-PES or PB-PES (Clinicaltraials.gov NCT01375855). All patients provided written informed consent for their inclusion into IVUS examination at post-procedure and 9-month follow-up. Paired serial IVUS data were available in 76 patients with 84 lesions (38 patients with 41 lesions for PB-PES and 38 patients with 43 lesions for PF-PES). Baseline patient and lesion characteristics were similar between 2 groups. No significant differences were observed between PB-PES and PF-PES in terms of change in vessel area either at proximal (16.77±5.20% vs. 15.97±4.27%; p=0.450) or at distal segment (11.59±4.91% vs. 11.03±4.74%; p=0.546). No differences were also found in the percentage of change in plaque area (-5.73±42.81% for PB-PES vs. 9.81±32.91% for PF-PES; p=0.122) and in lumen area (0.43±19.42% for PB-PES vs. -5.70±17.87% for PF-PES; p=0.178) at proximal edge. Conversely at distal edge, a significant increase in plaque area was observed with PF-PES compared to PB-PES. (plaque area: 2.23±18.54% for PB-PES vs. 12.59±28.62% for PF-PES; p=0.038) with subsequent reduction in lumen area (5.82±21.18% for PB-PES vs. -4.98±17.59% for PF-PES; p=0.024).
Conclusion: PF-PES did not seem to have a different edge response as compared to PB-PES. In particular they seem to increase plaque area with lumen reduction at the distal edge, probably due to differences in polymer-base drug release between the two platforms.

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Bioresorbable vascular scaffold in ST-elevation acute myocardial infarction. A preliminary OCT report

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Purpose: Bioresorbable vascular scaffolds (BVS) are a novel treatment for obstructive coronary lesions, however the impact of a thrombotic substrate on the vascular healing response after BVS implantation is currently unknown. We aimed to provide preliminary observations by optical coherence tomography (OCT) on the acute vascular response following BVS implantation in ST-elevation myocardial infarction (STEMI).
Methods: From 1/11/2012 to 14/2/2013, 21 patients underwent primary percutaneous coronary intervention (PCI) of the culprit lesion for treatment of STEMI with the ABSORB® everolimus-eluting BVS (Abbott Vascular, Santa Clara, CA). Implantation was successful in 20 patients (in 1 patient the scaffold could not cross the culprit lesion and a metallic stent was implanted instead). An OCT study of the implanted BVS was successfully performed in 11 patients, who were included in the analysis. In 8 patients a single scaffold was implanted in the culprit lesion, whereas 2 patients were implanted with 2 and 1 patient with 3 overlapping scaffolds. Analysis was performed in fixed 1-mm intervals and endpoints included scaffold and lumen area measurements, percentage of incompletely apposed struts, incomplete scaffold apposition (ISA) area in scaffolds with ISA, percent residual atherothrombotic burden (ATB; ratio of mean prolapse and intraluminal thrombus area divided by the mean scaffold area), and the presence of intra-scaffold, proximal and distal dissection.
Results: Two patients were implanted with the 2.5mm BVS, 4 with the 3.0mm BVS, and 5 with the 3.5mm BVS. Mean/minimal lumen area were 5.13±0.10mm^2/4.25±0.05mm^2 in 2.5mm BVS, 6.98±0.90mm^2/5.49±0.64mm^2 in 3.0mm BVS, and 9.08±0.84mm^2/6.39±1.27mm^2 in 3.5mm BVS, respectively. Mean/minimal scaffold area were 5.66±0.49mm^2/4.83±0.10mm^2 in 2.5mm BVS, 7.61±0.79mm^2/6.54±0.94mm^2 in 3.0mm BVS, and 9.86±0.89mm^2/7.36±1.29mm^2 in 3.5mm BVS, respectively. All scaffolds had tissue prolapse and the mean ATB (%) was 9.1±3.8%. ISA was found in 7/11 scaffolds, with 37/2539 struts (1.46%) being incompletely apposed. In scaffolds with ISA, mean ISA area was 0.10±0.10mm^2. In 3 scaffolds a proximal dissection was found (mean length 2.67±1.89mm) and in 1 scaffold a distal dissection (length 5mm), for none of which was any further intervention performed. Nine of 11 scaffolds had intra-scaffold dissection (median length 4mm).
Conclusions: Bioresorbable scaffold implantation is a feasible approach for the treatment of STEMI. OCT findings were similar to those previously reported in stable patients but with a higher residual atherothrombotic burden.

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Patients with MACE in the OCT guided arm of the CLI-OPCI study have more often an uncorrected stent deployment

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Background: The CLIO-PCI study suggested that the use of OCT can improve the clinical outcome in patients undergoing PCI. The aim of this study was to compare the incidence of the OCT-features predicting adverse events in patients who suffered from cardiac death or MI (MACE group) respect to patients who had no MACE (Control group).
Methods: 22 patients out of 335 had a MACE at 1 year of follow-up (MACE group) vs the remaining 313 without complications (Control group). Stents were assessed by OCT to address the features indicative of non-optimal stent deployment such as stent under-expansion, malapposition, edge dissection, thrombus burden and reference lumen narrowing. Optical coherence tomography images were analysed applying the quantitative thresholds of the CLI-OPCI study.
Results: The OCT features indicative of non-optimal stent deployment were observed more frequently in the MACE group compared to the Control group (table 1). Excluding malapposition, that did not differ in the 2 groups, the percentage of cases which had at least one of the OCT missed criteria was significantly hgher in the MACE group (89% vs 39%, P<0.001).

	MACE group	Control group
Underexpansion	44%	26%
Edge dissection	28%	4%
Reference impairment	17%	3%
Thrombus	33%	13%
Malapposition	33%	30%

Conclusion: Patients who had MACE in the CLI-OPCI study despite the use of OCT guided strategy were found to have more often an uncorrected stent deployment based on the OCT criteria. These results further emphasizes the role of OCT in optimizing stent implantation.

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Increased serum asymmetric dimethylarginine level is an independent predictor of contrast induced nephropathy

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Purpose: The aim of our study was to evaluate if serum asymmetric dimethylarginine (ADMA) level is an independent predictor of contrast induced nephropathy (CIN).
Methods: The study involved 90 consecutive patients with stable angina pectoris who underwent coronary angiography and ventriculography. Baseline serum creatinine (SCr) levels were between ≥1.2mg/dl- <2mg/dl. All patients were hydrated with intravenous isotonic saline at a rate of 1 mL/kg per hour for 6 hours before and 12 hours after procedure. The primary end point was the occurrence of CIN. Serum ADMA was determined by ELISA method.
Results: We detected statistically significant higher serum ADMA level in CIN(+) group compared to that of CIN(-) group [210.6 ng/mL (115.6-217.2) vs 91.5 ng/mL (65.2-122.1), p=0.01]. A serum ADMA level of >124.7 ng/mL had 80% sensitivity and 76% specificity in predicting the development of CIN (Fig. 1).

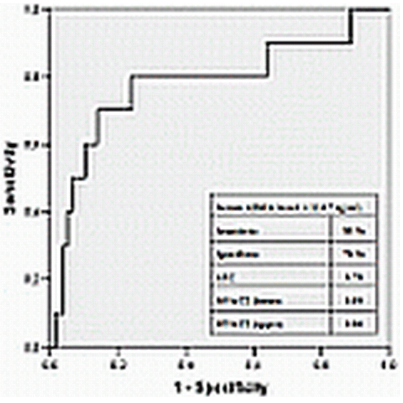

Figure 1

Conclusion: Increased serum ADMA level is an independent predictor of CIN.