1078-18 Effects of the QUADDS-QP Drug-Eluting Stent Extend Beyond the Targeted Area Into Adjacent Nonstented Zones: Results of the SCORE Trial


Background: The QUADDS-QP stent, a 316L stainless steel stent that delivers QP2 (an antiproliferative taxane derivative) from polymer sleeves, was shown to reduce restenosis (RS) as compared to placebo in the SCORE trial (RS includes thrombosis cases). Whether high doses of QP2 (4000 ug), delivered through 5 high capacity polymer membranes, as used in SCORE have any effect on adjacent non-target areas is not known.

Methods: We performed QCA on the first 260 randomized pts treated for de novo native lesions (134 bare metal vs 126 QP2 Stents). Follow-up QCA (MEDIS), available in 77% (N=202), was performed with systematic analysis of the QP2 stent area as well as 5mm proximal and distal non-stented segments. Results: Baseline lesion characteristics were similar in both groups, including ACC/AHA class >Bl (32%) mean vessel size (2.99mm), lesion length (11.8mm), and final results (final stent DS 5%). Follow-up restenosis was reduced by 72% within the QP2 stent, 67% proximal and 65% distal to the stent (see table). Conclusion: High dose QP2 delivered via a high capacity polymer on the QUEST stent demonstrated striking reductions in RS within the targeted stent zone, with equal effects extending at least 5mm proximally and distally beyond the confines of the target stent, likely representing elution of QP2 into adjacent non-stented vessel areas. Whether positive remodeling is the mechanism of luminal improvement at the edgels will be determined by IVUS.

<table>
<thead>
<tr>
<th>QUADDS-QP</th>
<th>QUEST</th>
<th>p value</th>
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<tbody>
<tr>
<td>Restenosis Stent(%)</td>
<td>10.1%</td>
<td>39.6%</td>
</tr>
<tr>
<td>FU Proximal Edge DS, %</td>
<td>24±21</td>
<td>35±24</td>
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<tr>
<td>Restenosis Prox Edge %</td>
<td>93.3%</td>
<td>20.4%</td>
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<tr>
<td>FU Distal Edge DS, %</td>
<td>16±18</td>
<td>25±22</td>
</tr>
<tr>
<td>Restenosis Distal Edge (%)</td>
<td>5.2%</td>
<td>14.7%</td>
</tr>
</tbody>
</table>

1078-20 Comparison of a Novel Polymer (PLL-g-PEG) With Gold-Coated and Stainless Steel Stents for Prevention of Neointimal Hyperplasia


Background: Stent coating aims to reduce neointimal hyperplasia. The purpose of this study was to investigate the effect of a novel polymer (poly-L-lysine with polyethylene-glycol-PLL-g-PEG) on neointimal hyperplasia and to compare it with gold-coated and stainless steel stents in porcine coronary models.

Methods: Three different (NIR) stents were implanted each in a total of 13 pigs: (1) an uncoated, stainless steel stent (control/bare NIR stent), (2) a polymer-coated stent (PLL-g-PEG dip coated on a bare NIR stent), and (3) a gold-coated stent (NIR Royal). Stents were randomly implanted into either the left anterior descending, left circumflex or right coronary artery. Stent length and diameter were 8 mm and 3.0 mm, respectively. Inflation pressure was adjusted to achieve a balloon-to-artery ratio of 1:1.1. Six weeks after implantation, animals were restudied by quantitative coronary angiography, and then stented arteries were examined by digital histomorphometry.

Results: At six weeks post-implantation, all stents were expanded and patent. Angiographic restenosis was 14.8±8.0% for the control, 9.7% for the polymer-coated and 21±5% for the gold-coated stents (p=0.04). Histologic examination showed no evidence of thrombus formation or inflammatory cells surrounding the stent struts. Quantitative histomorphometry revealed a significant increase in luminal area for gold-coated stents (4.0±0.2±14 mm2) compared with the control (5.5±0.2±2 mm2), polymer-coated stents (5.8±0.2±0 mm2), ANOVA p=0.01). Neointimal hyperplasia amounted to 2.5±0.0±3 mm2 in control, 2.1±0.0±1 mm2 in polymer-coated and 0.6±0.0±1 mm2 in gold-coated stents (ANOVA p=0.001). Histomorphometric results were 34±14% in control, 23±14% in polymer-coated, and 41±19% in gold-coated stents (ANOVA p=0.003).

Conclusions: Surface modifications of stainless steel stents by passive coatings modify the amount of neointimal proliferation in the porcine coronary model. Polymer coating with PLL-g-PEG significantly reduces neointimal proliferation, whereas gold enhances neointimal formation compared with stainless steel. Thus, stent coating with PLL-g-PEG may be beneficial for prevention of restenosis.

1078-21 Dramatic Inhibition of Neointimal Proliferation by the Paclitaxel-Eluting Stent: Results Without Radiation: Insights From the QCA Core Laboratory


Background: Even in the absence of clinically relevant restenosis, neointimal proliferation in the conventional metallic stent results in approximately 30% loss of lumen diameter achieved by the stent implantation. Preliminary data suggest that local drug delivery directly from the stent surface is effective in reducing the restenosis rate. We sought to determine if paclitaxel eluted from the stent surface could change the pattern of restenosis by significantly minimizing the in-stent proliferation and thus better preserving the post-procedural gain.

Method: ASPECT was a dose-finding trial comparing restenosis in stents eluting paclitaxel to control (conventional stents) at 4 to 6 month follow-up. While both doses significantly reduced restenosis as compared to control, the higher dose was most effective without apparent differences in safety. Of 177 patients enrolled, 60 patients received low-dose paclitaxel-eluting stents. By the analysis of the quantitative coronary angiography (QCA) data, we calculated the incidence of percent diameter stenosis of less than 5% at the follow-up, which would indicate extraordinary inhibition of neointimal growth. Results: Of patients in the high dose paclitaxel-coated stent group, 98% had a percent diameter stenosis of less than 50% (i.e. no binary restenosis) at the follow-up. More notably, 46% patients presented at the follow-up with percent diameter stenosis of 5% or less, compared to only 9% in the control group (p<0.001). There were no late thrombotic events.

Conclusion: The paclitaxel-eluting stent is capable of extraordinary inhibition of neointimal proliferation. This inhibition most likely does not occur at the cost of impaired vessel healing and reendothelialization since it was not associated with late thrombotic events. This pattern of minimal neointimal stent "paving" is fundamentally different from the no-reflow and early stent recoil risk of neointimal growth almost invariably induced by conventional metallic stents.

1078-22 A Quantitative Assessment of Regional Changes in Lumen Diameter After Photodynamic Therapy With Motexafin Lutetium In Patients Undergoing Stent Implantation

Jeffrey J. Popma, J. Nicholas Cox, Denis Walsh, Howard Herrmann, Daniel J. Simon, Campbell D. Rogers, Paul Kramer, Kimberly Shute, Kendrick Shunk, Alan Yeung, Ross Pipic, Daniel Adelman, Dean Kereakes, Brigham and Women's Hospital, Boston, Massachusetts.

Background: Motexafin lutetium (MLu, Antiradical Injection) is a synthetic expanded porphyrin-photosensitizing agent that localizes in atherosomes. Upon activation of MLu with infra-red light (>700nm), a photochemical signal is produced, singlet oxygen and local tissue damage occurs. Preliminary data suggests a potential benefit of MLu for restenosis, but its effects at the light therapy edges are unknown. Method: We quantitatively analyzed angiograms obtained from 58 patients who underwent stent placement and were enrolled in a phase 1 drug and light escalation study. Group I: MLu dose range: 0.04-0.4 mg/kg, light range: 100-200 J/cm2; Group II: MLu dose: 2.0-3.0 mg/kg, light range: 200-400 J/cm2. Image frames were compared before (BL) and just after endovascular illumination, and 6 months (FU) later. Analysis zones included the stent, injured segment, lighted segment, and a 5 mm segment proximal and distal to the light source. Results: referencing diameters measured 5 mm proximal and distal to the light source did not change during FU (BL: 2.83 ± 0.45 mm; FU: 2.83 ± 0.44 mm). Mean ± % stenosis at FU were 41.1% within the stent, 41.5% within the injured segment, 42.7% within the lighted segment, and 44.2% in the vessel. In-stent binary restenosis was 39.5% in Group I and 26.3% in Group II. Lumen changes at the proximal (0.17 ± 0.56 mm) or distal (0.04 ± 0.42 mm) ends were not consistent with an "edge effect." Conclusions: Treatment with MLu in patients undergoing stent implantation resulted in no deleterious lumen changes at the edge of the treatment zone (i.e. no "edge effect"). Restenosis was primarily located within the axial stent length and indicated an early dose and light response in its effect on restenosis. Further analysis of the potential biologic activity of MLu on the lighted but unirradiated atherosclerotic regions is ongoing.