ASSESSMENT BY OPTICAL COHERENCE TOMOGRAPHY OF A DEDICATED DRUG ELUTING STENT WITH BIODEGRADABLE POLYMER FOR THE INHIBITION OF NEOVASCULARIZATION AND NEointimal HYPERPLASIA

i2 Poster Contributions
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Background: Neovascularization, a critical component of plaque vulnerability, appears to be mediated by vascular endothelial growth factor (VEGF). We aimed to reduce neovascularization and intimal hyperplasia in hypercholesterolemic rabbits, using local delivery of bevacizumab, an antibody specific for VEGF

Methods: Ten New Zealand white rabbits were fed with atherogenic diet for 3 weeks. Eleven biodegradable bevacizumab-eluting stents (BES) were implanted in the distal aorta. The control group consisted of 7 New Zealand white rabbits treated with 7 bare metal stents covered by biodegradable polymer. All animals were treated with aspirin and clopidogrel for 4 weeks. Follow-up angiography and Optical Coherence Tomography (OCT) study were scheduled at 4 weeks. OCT images of each stent were analyzed and each strut was examined for apposition. A strut was defined as embedded when it was buried in the intima for more than half of its thickness, protruding when apposed to the intima but not embedded, and malapposed when there was no intimal contact. Tissues were obtained for immunohistological analysis

Results: Angiography and OCT in all stented arteries revealed no stent thrombosis or restenosis. We acquired 121 cross-sectional images from 110 mm in the stents of the BES group and 77 cross-sectional images from 70 mm in the stents in the control group. From the total of 1103 struts in the BES group, 1075 (97.5%) were embedded, while 28 (2.5%) struts were protruding and none malapposed. In the control group, 710 struts were analyzed, of which 697 were embedded (98.1%), 13 protruding (1.9%), and none malapposed (p=NS). Mean neointimal area in the BES group was 0.15±0.09 mm² comprising 2.45% of the lumen area, versus 0.78±0.21 mm² and 14.3% respectively in the control group (p<0.001). Maximal intimal thickness was significantly lower in the BES group compared to the control (60±11 um versus 135±7 um, p<0.001). BES treated arterial segments had significantly decreased microvessel density compared to the control group (1.7±0.7 vessels per mm² vs 15.5±1.2 vessels per mm², p<0.001)

Conclusions: This study demonstrated the safety and effectiveness of a dedicated biodegradable drug eluting stent in an animal model