

Peri-Strut Low Intensity Areas Identified by OCT Correlated with the Degree of Neointimal Formation After 3 Years Following Stent Implantation

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Background: Different long term healing patterns are frequently observed with OCT following stent implantation. The clinical implications of these findings are unknown. **Methods:** A total of 99 patients in whom a stent was implanted (total 125, 32 bare metal stents (BMS), 30 paclitaxel-eluting stents (PES), and 63 sirolimus-eluting stents (SES)) were followed with angiography and OCT beyond 3 years (average=4.9±2.1 years). Strut by strut analysis was performed in 3,053 cross-sectional images yielding to a total of 30,302 analyzable images. Peri-strut Low Intensity (PLI) images were defined as the presence of homogenous low intensity area around a stent strut without significant signal attenuation behind the area. The severity of PLI was assessed by quantifying the number and degree of PLI features in all analyzable imaging frames. **Results:** PLI was found in 19.4% of BMS, 12.6% of PES, and 6.0% of SES struts ($p < 0.001$). The mean neointimal thickness on struts with PLI was significantly higher than that without PLI regardless of the stent type (BMS= 0.62±0.30 versus 0.29±0.18 mm; PES=0.47±0.27 versus 0.19±0.18 mm; SES=0.56±0.31 versus 0.14±0.15 mm; $p < 0.001$). The severity of PLI correlated with the neointimal area and also with angiographical late loss in all stent types ($r = 0.407$ to 0.846 , $p < 0.05$). The severity of PLI correlated with angiographical binary restenosis even after adjustment with neointimal area in all stent types (odds ratio=9.785 to 34.72, $p < 0.05$). **Conclusions:** PLI in neointima appears to correlate with the severity of neointimal proliferation in the late phases of stent healing.