Optical Coherence Tomography and Angioscopic Evaluation of a Novel Sirolimus-Eluting Stent Coated with Bioabsorbable Salicylate-Based Polymer

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Background: Permanent polymers used in current DES can trigger chronic inflammation and hypersensitivity reactions, which may contribute to late thrombosis and rebound restenosis. We evaluated sirolimus-eluting stent coated with novel bioabsorbable salicylate-based polymer using OCT, angioscopy and histology.

Methods: Bare metal stents (BMS, n=14), salicylic acid/adipic acid bioabsorbable polymer-only coated metal stents (SA/AA, n=15), biostable polymeric sirolimus-eluting stents (Cypher, n=13) and SA/AA containing sirolimus (SA/AA+S, n=17) were randomly implanted in pig coronary arteries using QCA to optimize stent apposition. Diameter stenosis (DS) was evaluated by angiography, OCT and histology (aDS, oDS, and hDS). Intimal area was assessed by OCT and histology (oIA and hIA). Angioscopic and histological mural thrombus (aMT and hMT) was also assessed.

Results: aDS was significantly lower in SA/AA+S (-13.2±4.3%) than the other groups (BMS: 6.7±5.6%, SA/AA: 8.1±4.2%, and Cypher: -3.4±6.2%, respectively, P=0.01). oIA and hIA were lower in SA/AA+S and Cypher compared to SA/AA group (SA/AA+S: 1.65±0.18mm2, BMS: 2.11±0.32mm2, SA/AA: 2.99±0.36mm2, and Cypher: 1.88±0.34mm2, P=0.017). aMT and hMT were observed slightly higher in SA/AA+S and Cypher compared to BMS and SA/AA.

Conclusions: This sirolimus-eluting stent coated with novel bioabsorbable salicylate-based polymer showed favorable vascular compatibility and suppression of neointimal growth by different modalities