

¹Akane Foundation Tsuchiya General Hospital

Kenichi Yamane¹, Nobuo Shiode¹, Yousaku Okubo¹, Lisa Takahashi¹, Michitaka Amioka¹, Yuzo Kagawa¹, Tomoharu Kawase¹, Shinji Mito¹, Hiromichi Tamekiyo¹, Masaya Otsuka¹, Tomokazu Okimoto¹, Yuji Muraoka¹, Yoshiko Masaoka¹, Yasuhiko Hayashi¹

Background: Stent restenosis after drug-eluting stent (DES) implantation is an infrequent but poorly understood clinical problem in the DES era. The aim of this study was to evaluate the morphologic characteristics of stent restenosis by optical coherence tomography (OCT). **Methods:** We evaluated 55 patients with 57 stents (8 paclitaxel-eluting stents, 23 sirolimus-eluting stents, 2 zotalolimus-eluting stents, 2 biolimus-eluting stents, 7 everolimus-eluting stents, and 15 BMS) presenting with angiographically documented stent restenosis. Quantitative OCT analysis consisted of lumen and stent area measurement and calculation of restenotic tissue area and burden. Qualitative restenotic tissue analysis included assessment of tissue structure, backscattering and symmetry, visible microvessels, lumen shape, and presence of intraluminal material. OCT findings were compared depending on the time from stent implantation (<12 months vs >12 months) **Results:** Time from stent implantation was classified as <12 months and >12 months in 16, and 41 vessels, respectively. By OCT, restenotic tissue structure was layered in 44%, homogeneous in 12%, and heterogeneous in 44%. The predominant backscatter was high in 65%. Microvessels were visible in 16%. Lumen shape was irregular in 19% and there was intraluminal material in 14%. The mean restenotic tissue symmetry ratio was 0.56 ± 0.19 . Layered and heterogeneous restenotic tissue was more frequent in >12 months (48.8% and 48.8%, respectively) than in <12 (31.3% and 31.3%) ($P = .001$ for Tissue coverage structure). **Conclusion:** We demonstrate the ability of OCT to identify differential patterns of restenotic tissue after stenting. This information could help in understanding the mechanism of stent restenosis.