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Retrospective baseline OCT analysis of non-culprit segments with remote coronary plaque progression after PCI

Purpose: In DES era, detection of non-culprit vulnerable plaques may play an important role in the prevention of subsequent coronary events after PCI. We compared baseline coronary plaque characteristics between non-culprit segments with and without remote plaque progression after PCI using frequency-domain optical coherence tomography (FD-OCT).

Methods: From January 2013 to December 2014, serial angiographic assessments were performed in 284 patients at baseline and 8-month follow-up. Among those, we obtained baseline FD-OCT images in 45 patients. We compared baseline FD-OCT plaque characteristics between non-culprit segments with and without remote plaque progression at 8-month follow-up after PCI.

Results: Nine of 45 patients (20%) showed angiographically significant remote plaque progression in non-culprit segments at follow-up (A: plaque progression, n=9; B: no plaque progression, n=36). There were no significant differences in patient characteristics between groups. Group-A showed significantly higher incidences of lipid-rich plaque, thin-cap fibroatheroma (TCFA), microchannel, and cholesterol crystals (ChCs) than Group-B (89 vs. 33%, p=0.003; 56 vs. 6%, p=0.0002; 89 vs. 42%, p=0.01; 89 vs. 47%, p=0.02). The frequencies of macrophage accumulation and intraluminal thrombus were similar between groups (44 vs. 31%, p=0.43; 11 vs. 3%, p=0.28). Multivariate analysis including clinical and plaque characteristics showed TCFA was the strongest predictor of remote plaque progression in non-culprit lesions. The accuracy of non-culprit plaque progression was 87% using TCFA alone, however, it increased by 89% using TCFA in conjunction with any of lipid-rich plaque, microchannel, and ChCs.

Conclusion: FD-OCT may be useful to detect non-culprit vulnerable plaques post PCI to the culprit lesions.