ANALYSIS OF IN-STENT RESTENOSIS PATTERN BY OPTICAL COHERENCE TOMOGRAPHY: IMPACT OF DIFFERENCE IN STENT TYPE AND FOLLOW-UP PERIOD

i2 Poster Contributions
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Authors: Ippei Kosedo, Shingo Hosogi, Yuki Tsujimoto, Kentaro Shibayama, Naoki Saito, Suguru Otsuru, Yoji Okamoto, Mana Kusunose, Masao Imai, Hiroshi Tasaka, Daiji Hasegawa, Yoshiakazu Shigemoto, Seiji Habara, Hiroyuki Tanaka, Takeshi Maruo, Akitoshi Hirono, Yoshiharu Nishibori, Yasushi Fuku, Naoki Oka, Harumi Kato, Hiroyuki Yamamoto, Satoki Fujii, Tsuyoshi Goto, Kazushige Kadota, Kazuaki Mitsudo, Kurashiki Central Hospital, Kurashiki, Japan

Background: Morphological characteristics of in-stent restenosis (ISR) by optical coherence tomography (OCT) have not been clarified yet. We therefore evaluated the various ISR pattern by OCT.

Methods: Patients (n=86, 88 lesions) presenting with angiographically documented ISR from June 2008 to August 2009 were included. Qualitative restenotic tissue analysis by OCT included the assessment of tissue structure (homogeneous, heterogeneous, or layered), predominant backscatter (high or low), visible microvessels, lumen shape, and the presence of intraluminal material. The types and numbers of stent were as follows: sirolimus-eluting stent in 63 (71.8%), paclitaxel-eluting stent in 14 (15.9%), bare-metal stent in 10 (1.4%), and biolimus-eluting stent in 1 (1.1%) of the 88 lesions. Restenosis pattern was angiographically classified by lesion length as diffuse (>10mm) and focal (<10mm). Restenosis timing was classified by the length of time after stent implantation as midterm (<1 year) and late (>1 year).

Results: Diffuse restenosis was found in 14 (15.9%) lesions. The tissue structure was homogenous in 45 (51.1%), layered in 35 (39.8%), and heterogeneous in 8 (9.1%) lesions. The predominant backscatter was high in 52 (59.1%) lesions. The lumen shape was irregular in 32 (36.4%) lesions. The presence of intraluminal material was observed in 36 (40.1%) lesions. Microvessels were visible in 11 (12.5%) lesions. Paclitaxel-eluting stent had significantly higher frequency than sirolimus-eluting stent in heterogeneous tissue (35.7% vs 4.8%, p=0.0031) and low backscatter (71.4% vs 34.9%, p=0.027). The tissue structure was more homogeneous than layered (64.3% vs 39.1%, p=0.032) in midterm restenosis, however, more layered than homogeneous in late restenosis (54.3% vs 23.8%, p=0.0068).

Conclusions: Our study suggested that the mechanism of stent restenosis may differ depending on stent type and the restenosis process may change between midterm and late restenoses.