Angioscopic evaluation of vascular healing at 1 and 12 months after drug-coated stent implantation

S. Kosugi, Y. Ueda, H. Abe, T. Mishima, K. Shinouchi, T. Ozaki, K. Takayasu, Y. Iida, T. Ohashi, C. Toriyama, M. Nakamura, M. Date, M. Uematsu, Y. Koretsune

National Hospital Organization Osaka National Hospital, Cardiovascular Division, Osaka, Japan
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Background: Polymer- and carrier-free Biolimus-A9-coated stent (DCS) is expected better vascular healing compared with conventional durable polymer drug-eluting stents (DES). Moreover, DCS had been demonstrated in clinical trials to allow one-month short dual antiplatelet therapy, which might achieve sufficient healing at only 1 month after implantation. However, the process of vascular healing after DCS implantation has not been elucidated by angioscopic observation.
Purpose: To evaluate the process of vascular healing at 1 month and 12 months after DCS implantation.
Methods: This study included 57 patients treated with DCS or durable polymer everolimus-eluting stents (EES) in our hospital from April 2017 to April 2019. Firstly, the angioscopic findings of DCS at 1 month (n=16) and 12 months (n=14) after implantation were respectively compared with EES at 12 months after implantation (EES-12, n=35) as a standard healing status of DES. Secondary, angioscopic findings of DCS at 1 month and 12 months after implantation were compared among the serially observed eight patients. Neointimal coverage (NIC) grade, yellow colour grade, and the presence of thrombus were evaluated. NIC grade was classified as grade 0 (no neointimal coverage), grade 1 (struts were bulged into lumen but covered), grade 2 (struts were embedded in the neointima but visible), or grade 3 (struts were fully embedded and invisible). Yellow colour grade was classified as grade 0 (white), grade 1 (light yellow), grade 2 (yellow), or grade 3 (intensive yellow).
Results: At 1 month after DCS implantation, dominant NIC grade was lower (0.3±0.5 vs. 1.5±0.7, p<0.001) and the frequency of thrombus was higher (38% vs. 6%, p=0.008) than EES-12. On the other hands, at 12 months after DCS implantation, dominant NIC grade was higher (2.1±0.6 vs. 1.5±0.7, p=0.013) and the frequency of thrombus was not different (7% vs. 6%, p=1.000) in comparison with EES-12. By serial observation of DCS, dominant NIC grade was higher at 12 months than at 1 month (2.3±0.5 vs. 0.4±0.5, p<0.001), while yellow colour grade (1.0±0.5 vs. 1.5±1.2, p=0.227) and the frequency of thrombus adhesion (0% vs. 38%, p=0.200) were not different.
Conclusion: Compared with EES-12, vascular healing of DCS was inferior at 1 month but superior at 12 months.

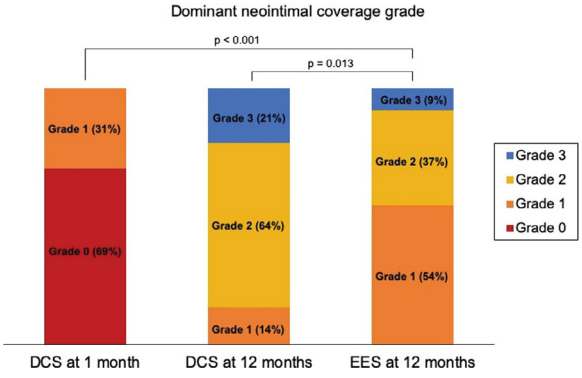

Figure 1