BACKGROUND According to recent studies, the presence of peri-strut low intensity area (PLIA) detected by optical coherence tomography (OCT) has been described as a potential marker of abnormal neointimal healing such as continuous inflammation, fibrin deposition, and extracellular matrix accumulation. However, the impact of PLIA presence on clinical events and its risk factors remain unknown.

METHODS From the Kobe University OCT registry, we enrolled a total of 382 lesions treated with coronary stents (BMS: n=23, 1st generation DES: n=186, 2nd generation DES: n=249) from 289 patients that underwent mid-term follow-up OCT 6-12 months after stent implantation. In addition to standard OCT parameters, PLIA was evaluated with the definition of homogenous low-intensity area around a strut without significant signal attenuation behind the area. Clinical follow-up was performed to evaluate target lesion revascularization (TLR) for a median duration of 2.7±1.9 years after stenting.

RESULTS PLIA was identified in 205 lesions (54%) on the follow-up OCT (PLIA+ group). The remaining 177 lesions did not exhibit PLIA (PLIA- group). The incidence of smoking habit, unstable angina pectoris or acute myocardial infarction, BMS and paclitaxel eluting stents use was significantly higher in the PLIA+ group. Also, the rate of dyslipidemia and dual antiplatelet therapy at the timing of mid-term follow-up OCT was significantly lower in the PLIA+ group than PLIA- group. In multivariate logistic analysis, smoking habit, BMS and paclitaxel eluting stents use were independently associated with the presence of PLIA (odds ratio [OR]: 1.64, P=0.026, OR: 25.77, P=0.002, OR: 5.10, P<0.001 respectively). Moreover, patients with PLIA had a higher incidence of TLR during the clinical follow-up (PLIA+: 16.6% vs. PLIA-: 1.7%, P<0.001) (Figure A). Multivariate logistic regression analysis showed that, in addition to statin use, the presence of PLIA was an independent risk factor for TLR (OR: 7.36, P=0.001). A landmark analysis at one year after stent implantation showed that the presence of PLIA was associated with higher incidence of late TLR (TLR-1 year) after stenting (Figure B).

CONCLUSIONS The presence of PLIA on mid-term OCT imaging was associated with TLR after stent implantation. Detailed stent assessment by mid-term follow-up OCT may help predict future stent failure in patients with coronary artery disease.

CATEGORIES IMAGING: Intravascular

KEYWORDS Coronary artery disease, Optical coherence tomography, Target lesion revascularization

PLIA+ vs. PLIA- group. In multivariate logistic analysis, smoking habit, BMS and paclitaxel eluting stents use were independently associated with the presence of PLIA (odds ratio [OR]: 1.64, P=0.026, OR: 25.77, P=0.002, OR: 5.10, P<0.001 respectively). Moreover, patients with PLIA had a higher incidence of TLR during the clinical follow-up (PLIA+: 16.6% vs. PLIA-: 1.7%, P<0.001) (Figure A). Multivariate logistic regression analysis showed that, in addition to statin use, the presence of PLIA was an independent risk factor for TLR (OR: 7.36, P=0.001). A landmark analysis at one year after stent implantation showed that the presence of PLIA was associated with higher incidence of late TLR (TLR-1 year) after stenting (Figure B).

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