

Impact of patients' characteristics, procedural, angiographic, and IVUS findings on neoatherosclerosis after stent implantation: Insights from optical coherence tomography study

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Purpose: Recent studies have reported that the development of neoatherosclerosis (NA) inside the stents is associated with late complications such as very late stent thrombosis and late catch up. However, few data exist regarding clinical background of NA after stenting. Therefore, we evaluate the impact of patients' characteristics, procedural, angiographic, and IVUS findings on development of stent-related NA which was detected by optical coherence tomography (OCT).

Methods: We studied 99 stents in 85 patients in which the mean neointimal thickness was >100 µm. The presence of lipid-laden neointima or calcification inside the stents was defined as NA. All lesions were divided into two groups (NA; n=20, and non-NA; n=79), and patients characteristics, procedural, angiographic, and IVUS findings at stent implantation were compared.

Results: As for baseline characteristics, age and total cholesterol level were significantly higher in NA than in non-NA. As for procedural characteristics, duration since stent implantation, especially in BMS, was significantly longer in NA than in non-NA (60.5±44.8 vs. 23.4±24.1 months, P<0.0001). Maximum balloon pressure was significantly higher in NA than in non-NA. Interestingly, by IVUS positive remodeling at pre-procedure was frequently observed in NA compared to non-NA. In multivariate analysis, duration since stent implantation and pre-interventional artery remodeling by IVUS remained independent predictors for NA (Table).

Conclusions: These results demonstrate that in addition to the duration since stent implantation, pre-interventional arterial remodeling by IVUS may be related to the development of NA inside the stents.

Predictors for neoatherosclerosis

	Univariate models			Multivariate model		
	Odds ratio	95% CI	P value	Adjusted Odds ratio	95% CI	P value
Positive remodeling	8.33	2.03–34.3	0.0033	6.64	1.37–32.06	0.0185
Duration since stent implantation	1.03	1.01–1.05	0.0043	1.03	1.00–1.06	0.0235
Total-cholesterol	1.02	1.00–1.03	0.0334	1.02	0.99–1.04	0.1239
DES or BMS	0.27	0.07–1.01	0.0514	0.25	0.04–1.38	0.1105

BMS, bare-metal stent; CI, confidence interval; DES, drug-eluting stent.