Background: Slow flow or no re-flow phenomenon is mainly induced by distal embolization during PCI and is associated with unfavorable long-term clinical outcomes. Various imaging modalities have failed to detect high risk patients of distal embolization for whom distal protection might be beneficial. The object of this study is to examine the frequency of distal embolization using filter-type distal protection device and to clarify the predicting factors of distal embolization.

Methods: Consecutive patients (n=98) with or without ACS who received PCI with filter-type distal protection device (FilterWire) and successful angiographic and VH-IVUS examination of target lesion were prospectively enrolled. Presence of yellow plaque and plaque rupture were evaluated by angiography; and tissue classification and plaque burden were evaluated by IVUS. Distal embolization was evaluated by the pathological examination of collected material in the filter device.

Results: Distal embolization of thrombus tended to be frequent in ACS than in non ACS patients (81.03% vs. 65%, P=0.074). That of plaque debris was more frequent in ACS than non-ACS patients (48.28% vs. 25%, P<0.05). Distal embolization of plaque debris was more frequent in the patients with ruptured plaque than in those without it (85.7% vs. 12.3%, P<0.05), in the patients with yellow plaque than in those without it (50.7% to 7.0%, P<0.05), and tended to be more frequent in the patients with large (>75%) plaque burden than in those without it (46.3% vs. 29.5%, P=0.09). Remarkably, 94% of patients with ruptured plaque and large plaque burden had distal embolization of debris.

Conclusion: Distal embolization of plaque debris was detected frequently in the patients with ruptured yellow plaque and large plaque burden. Using both angiography and IVUS before procedure, we may predict distal embolization. Filter-type distal protection device would be potentially beneficial for those high risk patients.

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Relative Dose and Vascular Response After Resolute Zotarolimus-Eluting Stent Implantation: A Dosimetric 3D-Intravascular Ultrasound Study

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Background: In drug-eluting stents, a fixed loading dose per metal area may result in considerable variability in actual dose exposed to vessel wall due to differences in strut spacing once expanded in varying sizes of lesions. This study aimed to evaluate potential effects of different dose intensity, as estimated by 3D-IVUS dosimetry, on vascular response after Resolute zotarolimus-eluting stent (ZES) implantation.

Methods: Serial (baseline and 8-9 mo) 3D-IVUS was performed in 121 lesions treated with a single Resolute ZES. Neointimal obstruction was calculated as neointima/stent volume. Cross sectional narrowing (CSN) was defined as neointima/stent area. In each lesion, exposed dose intensity was calculated as known loading dose/measured stented segment surface area at post-procedure. Lesions were divided into tertiles based on the dose intensity.

Results: The exposed dose intensity ranged from 0.76 to 1.58 μg/mm2 (1.08±0.18 μg/mm²). The low dose group showed a trend toward slightly greater neointima. However, neointimal obstruction, max CSN, neointimal thickness, vessel remodeling, and the incidence of late incomplete stent apposition were not significantly different among the 3 groups.

Conclusion: Detailed 3D-IVUS dosimetry revealed a significant lesion-to-lesion variability in dose intensity exposed to vessel wall following Resolute ZES implantation. However, Resolute appears to yield equally effective neointimal suppression and no evidence of adverse local vessel response, regardless of the varying