CORONARY PLAQUE COMPONENTS ASSESSED BY VIRTUAL HISTOLOGY-INTRAVASCULAR ULTRASOUND ARE NOT ASSOCIATED WITH NEOINTIMAL HYPERPLASIA IN PATIENTS WHO UNDERWENT DRUG-ELUTING STENT IMPLANTATION

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Background: It has not been known about the association between plaque components and neointimal hyperplasia in patients who underwent drug-eluting stent (DES) implantation. Virtual histology-intravascular ultrasound (VH-IVUS) can provide quantitative information on plaque components.

Methods: We used VH-IVUS to evaluate the relation between neointimal hyperplasia and plaque components in 129 lesions in 102 patients who underwent DES implantation (65 paclitaxel eluting stent, 27 sirolimus eluting stents, 28 zotarolimus eluting stents, 9 other drug-eluting stents). We compared the VH-IVUS parameters between 19 in-stent restenosis (ISR) lesions and 110 non-ISR lesions. VH-IVUS classified the color-coded tissue into four major components: fibrotic (FT), fibro-fatty (FF), dense calcium (DC), and necrotic core (NC).

Results: ISR group was more diabetics (50% vs. 33%, p=0.050) and higher glucose level compared non-ISR group (173±57 mg/dl vs. 143±40 mg/dl, p=0.036). There were no significant differences in target vessel and ACC/AHA lesion type between ISR and non-ISR groups. There were no significant differences in lesion site external elastic membrane (13.9±3.1 mm² vs. 14.7±5.5 mm²) and plaque plus media areas (3.9±0.7 mm² vs. 4.0±1.4 mm²) between ISR and non-ISR groups. There were no significant differences in relative plaque components at the minimum lumen site (FT: 56.7±16.8% vs. 59.0±13.7%, FF: 6.3±5.1% vs. 11.5±9.8%, DC: 13.3±9.9% vs. 9.3±8.3%, NC: 23.7±12.9% vs. 20.1±11.9%) and relative volumetric plaque components (FT: 57.5±11.9% vs. 58.7±10.9%, FF: 10.1±6.4% vs. 12.0±8.1%, DC: 12.4±6.8% vs. 10.9±6.8%, NC: 20.3±10.6% vs. 18.5±9.4%) between ISR and non-ISR groups. There were no correlations between follow-up %neointima volume and volumetric plaque components (%FT: r=-0.002, p=0.990, %FF: r=0.187, p=0.175, %DC: r=-0.014, p=0.920, %NC: r=-0.123, p=0.376).

Conclusions: There was no relation between plaque components assessed by VH-IVUS and neointimal hyperplasia after DES implantation. Plaque components may affect plaque vulnerability at the initial clinical presentation, but not affect long-term clinical outcome.