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IN VIVO VIRTUAL HISTOLOGY INTRAVASCULAR ULTRASOUND COMPARISON OF NEOINTIMAL HYPERPLASIA WITHIN DRUG-ELUTING-VERSUS BARE METAL STENTS IN PATIENTS WITH STEMI

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Objectives The process of in-stent neointimal hyperplasia (NIH) between drug-eluting stents (DES) and bare metal stents (BMS) might be different. We compared in vivo composition of in-stent NIH between DES and BMS using virtual histology-intravascular ultrasound (VH-IVUS) in Patients with ST segment elevation myocardial infarction (STEMI).

Methods From May 2009 to Dec 2011, 63 patients were prospectively included in the protocol. Volumetric VH-IVUS was used to compare in-stent NIH between 45 DES and 33 BMS in 63 patients who underwent PCI because of STEMI. The inner and outer VH-IVUS contours were drawn in a way to avoid the stent strut artefacts. Cross-sectional analysis was done at every VH-IVUS frame within the stent, thereby allowing volumetric measurement of stent, lumen, and NIH and its components.

Results Baseline characteristics and IVUS measurements were similar between DES and BMS groups. The duration of follow-up was similar between DES (median 9 months (IQR, 3–15)) vs BMS (median 10 months (IQR, 4–15)), (p=0.32).%necrotic core (NC) volume was significantly higher in DES than BMS:19.5 (16.3, 25.6) vs 12.1 (8.2, 18.5) (p=0.006), %NC volume significantly increased with time in BMS (p=0.007), but not in DES (p=0.24) so that at any given time point, %NC in DES was greater than in BMS. After adjustment for baseline differences, only DES (p=0.003) and stent age (p=0.043) were independent predictors of %NC volume. VH-IVUS in-stent thin-cap fibroatheromas were detected only in the DES group:34.8% vs 1.5%, p=0.013.

Conclusions in vivo composition of in-stent NIH between DES and BMS was different, suggesting that the process of in-stent NIH in DES and BMS is diverse in patients with STEMI