INFLUENCE OF NON-UNIFORM STENT EXPANSION ON NEOINTIMAL HYPERPLASIA AFTER BARE-METAL AND ZOTAROLIMUS-ELUTING STENTS IMPLANTATION

I2 Poster Contributions
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Background: Non-uniform stent expansion (NUSE) has been reported to be a risk factor for in-stent restenosis after bare metal stent implantation in porcine coronary arteries. It is not fully elucidated whether NUSE is associated with increased neointimal hyperplasia assessed by intravascular ultrasound (IVUS) after zotarolimus-eluting stent implantation (ZES).

Methods: Data were obtained from the IVUS database of the Cardiovascular Core Analysis Laboratory at Stanford University. A total of 319 patients (ZES n=255, Driver BMS n=64) whose serial volumetric IVUS analysis was available were enrolled into this study. Percent neointimal volume (%NIV) was calculated as (NIV/stent volume)*100. Cross-sectional narrowing (CSN) was defined as neointimal area divided by stent area (%). NUSE was evaluated from longitudinal reconstructions as minimum stent area divided by maximum stent area at baseline.

Results: At 8 months, the NUSE correlated with %NIV and max % CSN negatively for both stent groups (for BMS: %NIV, P=0.035, max % CSN, P=0.033, for ZES: %NIV, P=0.001, max %CSN, P<0.001). After adjustment for baseline demographic and lesion characteristics such as stent size, length, type B2/C lesion, and presence of branch, the NUSE was independently associated with increased neointimal proliferation including %NIV (standardized β=-0.36, P=0.018) and max % CSN (standardized β=-0.36, P=0.017) for BMS, but not for ZES (%NIV; standardized β=-0.61, P=0.540, max % CSN; standardized β=-0.04, P=0.663). Minimum lumen area in the stented segment at baseline did not correlate with % NIV and max % CSN for both BMS and ZES.

Conclusion: Our results showed that non-uniform stent expansion appeared to be a risk factor for increased neointimal hyperplasia for BMS. However, this dependency was completely mitigated in ZES, presumably through biological effects of this drug-eluting stent.