REPRODUCIBILITY OF NEAR-INFRARED SPECTROSCOPY FOR THE DETECTION OF LIPID CORE CORONARY PLAQUES AND OBSERVED CHANGES AFTER CORONARY STENT IMPLANTATION

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Background: Catheter-based intracoronary near-infrared spectroscopy (NIRS) allows in-vivo evaluation of lipid core plaques (LCPs). In the present study we sought to evaluate the reproducibility of NIRS for LCP detection and to examine stenting-induced changes in NIRS findings.

Methods: NIRS assessment using an automated pullback catheter was performed in duplicate in 36 vessels in 31 patients. The reproducibility of the Lipid Core Burden Index (LCBI) and the presence and number of LCPs (using 9 different definitions with variable thresholds for lipid signal intensity and length) was assessed. The changes in LCBI after stenting were also assessed in 25 vessels in 22 patients.

Results: The mean LCBI of the first and second pullback was 64 ± 43 and 70 ± 62, respectively with excellent correlation (Spearman’s rho 0.927, intra-class correlation coefficient 0.925, Figure). Depending on the LCP definition used, the mean LCP length and median LCP number ranged from 2.44 to 17.25 mm, and from 0 to 2, respectively per artery studied. High correlation was observed between the two pullbacks for total LCP length (depending on the LCP definition used, the Spearman’s rho and the intra-class correlation coefficient ranged from 0.72 to 0.89, and from 0.76 to 0.91, respectively) and for LCP number. The mean LCBI decreased by 40% from 78 ± 47 to 48 ± 38 after stenting (p<0.001, Figure).

Conclusions: The LCBI and LCP length NIRS measurements have high reproducibility. LCBI significantly decreases after coronary stenting.