THINNER FIBROUS CAP AND GREATER INCIDENCE OF PLAQUE RUPTURE CHARACTERIZE CULPRIT LESIONS IN PROXIMAL SEGMENTS OF CORONARY ARTERIES AS ASSESSED BY OPTICAL COHERENCE TOMOGRAPHY

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Background: Recent studies have shown that the majority of culprit lesions (CLs) are located in proximal segments of coronary arteries. However, distinct plaque characteristics of CLs according to their location have not been extensively investigated. We studied the in vivo morphological characteristics of CLs in patients with acute coronary syndrome (ACS) according to their location, as assessed by optical coherence tomography.

Methods: Sixty-two consecutive patients with ACS that underwent cardiac catheterization within 24 hours from symptom onset were enrolled. After completion of diagnostic coronary angiography, the culprit lesion was clearly identified angiographically and classified as proximal or distal depending on the distance from ostium. Optical coherence tomography study was then performed in all culprit lesions. Fibrous cap thickness (FCT) was measured at the thinnest part of the plaque of culprit lesions. Presence of plaque rupture was also recorded. Plaque rupture was defined as the presence of fibrous cap discontinuity.

Results: Forty-one patients of the total study population (66.1%) had FCT≤65 μm. Mean FCT was 57±31μm for LAD (n=29), 58±36 μm for LCX (n=8) and 58±26 μm for RCA (n=25) (p=0.92). A ruptured site was found in 51.7% of LAD lesions (n=15), in 62.5% of LCX lesions (n=5) and in 68% (n=17) of RCA lesions (p=ns). Thirty-three culprit lesions were located in the distal part of coronary arteries and 29 proximally. In the group of distal culprit lesions, 54.5% had thin cap (n=18), while in the group of proximal culprit lesions 79.3% (n=23) presented such morphology (p=0.06). Mean FCT of the group with proximal location of the culprit lesion was 46±20μm versus 67±33μm of the group of distal CL (p=0.03). A rupture was found in 72.4% of the proximal lesions (n=21) and in 48.5% (n=16) of the distal lesions (p=0.03).

Conclusions: Culprit lesions in proximal segments of coronary arteries have thinner fibrous cap and are more often ruptured than culprit lesions located in the distal part of coronary arteries. This study suggests that the higher frequency of ACS due to proximally located plaques may be explained by distinct morphological characteristics of proximal lesions.