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Acute Coronary Syndromes

DETAILED MORPHOLOGICAL CHARACTERISTICS OF PLAQUES WITH EROSION: A THREE-VESSEL OCT AND IVUS STUDY

Poster Contributions

Hall C

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Session Title: Acute Coronary Syndromes: Biologic Considerations

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Background: Plaque erosion accounts for one-third of acute coronary syndrome (ACS) presentations. Although plaque rupture has been well characterized, little is known about which plaque type is prone to erosion and formation of occlusive thrombus. We hypothesized that there are some morphological features that are specific for plaque erosion.

Methods: In 26 patients who had three-vessel optical coherence tomography (OCT) and intravascular ultrasound (IVUS) imaging, 26 eroded culprit plaques and 43 non-eroded, non-culprit plaques were identified.

Results: Angiographic findings showed eroded plaques located more frequently within the left anterior descending artery (LAD) (54% vs. 23%, $p=0.0041$). Macrophage, microvessels, and cholesterol crystal were more frequent in eroded than in non-eroded plaques (69% vs. 35%, $p=0.009$; 65% vs. 19%, $p<0.001$; 39% vs. 19%, $p=0.045$, respectively), whereas plaque phenotype, fibrous cap thickness, and lipid arc were similar between the groups. IVUS showed that plaque burden was greater and lumen area smaller in eroded plaques ($76\pm 12\%$ vs. $62\pm 12\%$, $p<0.001$ and 2.9 ± 1.7 vs. 5.4 ± 2.8 mm², $p<0.001$, respectively). Multivariate analysis demonstrated that LAD, microvessels, and greater plaque burden on IVUS were independently associated with plaque erosion ($p=0.038$, $p=0.003$ and $p=0.008$, respectively).

Conclusions: The LAD, microvessels, and greater plaque burden are independently related to plaque erosion, suggesting that local factors play an important role in the development of plaque erosion.