MICRO-CHANNEL STRUCTURE IDENTIFIED BY OPTICAL COHERENCE TOMOGRAPHY IS RELATED TO PLAQUE VULNERABILITY IN PATIENTS WITH CORONARY ARTERY DISEASE

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Background: Increased neovascularization in atherosclerotic plaques is associated with plaque vulnerability. The high-resolution of optical coherence tomography (OCT) may allow us to directly visualize plaque neovascularization. We sought to assess the relation between micro-channels in culprit plaques identified by OCT and plaque vulnerability in patients with coronary artery disease (CAD).

Methods: In 63 patients with CAD, we examined lesion morphologies with both OCT and intravascular ultrasound before any interventions.

Results: Micro-channel was defined as a no-signal capillary-like tubular structure on the OCT image. Micro-channels were found in 24 (38%) of 63 patients. Patients were divided into 2 groups with or without micro-channel. The frequency of plaque rupture tended to be higher in the micro-channel group (50% vs. 28%, P=0.11). The thickness of fibrous cap (median 60μm vs. 100μm, P=0.001) was significantly thinner in patients with micro-channel, and there were significant differences in the frequency of thin-cap fibroatheroma (54% vs. 21%, P=0.012) and positive remodeling (67% vs. 36%, P=0.02) between the groups. High-sensitivity C-reactive protein (hs-CRP) levels was significantly higher in the micro-channel group (median 0.27mg/dl vs. 0.13mg/dl, P=0.015). Moreover, increased micro-channel counts were associated with higher hs-CRP levels (P=0.01).

Conclusions: There was a significant relationship between micro-channels identified by OCT and plaque vulnerability.