



Vascular Disease

VULNERABLE PLAQUE IN ATHEROSCLEROSIS IS CHARACTERIZED BY MICROVASCULATURE INVOLVING THE VESSELS DERIVED FROM “VASA VASORUM INTERNA”

ACC Oral Contributions

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Background: The intraplaque micro-vessels has been thought to be a result of angiogenesis from the peri-arterial vessels so called vasa vasorum externa (WE). We present the morphological characteristics of intra-plaque micro-vessels responsible for the plaque hemorrhage.

Methods: We investigated the human carotid atherosclerotic plaques and divided the plaque lesions to 4 parts: cap, shoulder, lipid core, and media. Hemorrhagic plaque (HP) was defined as the area containing RBCs (>1mm²) under HE staining. In immunohistochemistry, the density of micro-vessels (CD34 positive lumens) and macrophages (CD68 positive cells) in each lesion was estimated in a semi-quantitative manner (grade 0~3). Furthermore, pathological three-dimensional (3D) imaging was performed to clarify the vasculature of micro-vessels.

Results: The positive relationship of the density between micro-vessels and macrophages was found in the lesions of cap and shoulder (p=0.001, respectively). In the shoulder, HP showed a higher density of micro-vessels than non-HP (p=0.004). Inversely, in the media, HP showed lower density of micro-vessels than non-HP (p=0.005)(Figure). 3D images newly clarified that micro-vasculature in the plaque was involved in the vessels derived from the arterial lumen side, as designated “vasa vasorum interna (VI)”.

Conclusion: The WI density, not WE in the plaque may be closely associated with the formation of vulnerable plaques causing HP.

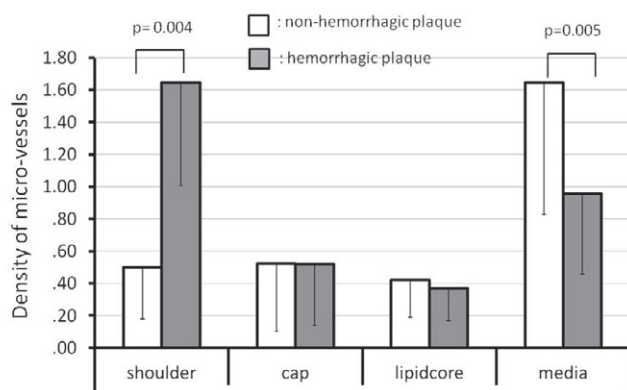


Fig. The difference of intra-vascular density between hemorrhagic and non-hemorrhagic plaque, according plaque part.