Histological explanation of epicardial adipose tissue (EAT) on atrial fibrillation -Digital morphometric study in autopsy tissues-

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Background: Recently, increase of epicardial adipose tissue (EAT) volume with the elevation of several clinical markers has been reported in atrial fibrillation (AF) patients. We sought to reveal morphological difference of EAT with or without AF in autopsy hearts.

Methods: Objects are 20 cases, 13 males, ages from 51 to 88, mean 64 year old. In their life time, 15 cases did not show conspicuous arrhythmia, and 5 cases accompanied persistent AF without apparent heart diseases. At the left atrial (LA) anterior wall or LA appendage - mitral valve (LAA-MV) isthmus, dimensions of EAT and adjacent atrial musculature (AM) were examined digitally in both groups respectively.

Result: In AF patients, the ratio of EAT/AM was increased in LA anterior wall $(0.48\pm0.14 \text{ vs } 0.43\pm0.25)$, and also in LAA-MV isthmus $(2.18\pm1.3 \text{ vs } 1.83\pm0.93)$, but differences were not significant. After the detailed histological observation, however, AF cases showed fibrous replacement with fine adipose infiltration with various degrees, around the Bachmann bundle and surrounding LA musculature including Marshall vein bundle or coronary sinus musculature.

Conclusion: Age related alteration comprised with adipose infiltration or fibrous replacement of LA wall was revealed in AF autopsy cases. This process seems to enhance tissue diversity and to contribute to establish AF substrates in elderly patients.