

Summary

Atrial fibrillation – morphological and electrophysiological changes of the atrial myocardium

Atrial fibrillation (AF), the most common sustained cardiac arrhythmia, was considered as pure functional disorder for long time. In recent years, there were identified atrial locations, which are involved in the initiation and maintenance of this arrhythmia. These structural changes, so called remodeling, start at electric level and later they affect contractility and morphology.

We attempted to find a possible relation between morphological (scarring, isolated atrial amyloidosis (IAA), left atrial (LA) enlargement) and electrophysiological (ECG features) changes in patients with AF. We examined grossly and histologically 70 hearts of necropsy patients – 44 with a history of AF (subclassified into two subgroups: PERM – patients with permanent or persistent AF – 20, and PAROX – patients with paroxysmal and newly diagnosed AF – 24), and 26 control cases without any history of AF. Premortem ECGs were evaluated.

The patients with AF had significantly heavier hearts, larger LAs, more advanced fibrosis in atrial myocardium and more severe amyloidosis in both atria. The hearts of the PERM subgroup were the most affected. Severity of amyloidosis was significantly higher in the left vs. right atria. Distribution of both fibrosis and amyloidosis was irregular. The most affected area was in the LA anterior wall. An interesting finding was the universal absence of IAA in the sinoatrial node. Patients with a history of AF and with most severe amyloidosis had more often abnormally long P waves on ECG.

The knowledge of distribution of structural changes in the heart atria could be used to target histological examination of the heart. Finding of long P wave may contribute to diagnosis of a hitherto undisclosed atrial fibrillation.