Editorial / *Editöryal Yorum*

Left atrial fibrosis affects left ventricular systolic function in patients with atrial fibrillation

Sol atriyal fibrozis atriyum fibrilasyonlu hastalarda sol ventrikül sistolik fonksiyonu etkiler

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Atrial fibrillation (AF) is the most frequent arrhythmia encountered in clinical practice, occurring in 1%-2% of the general population.[1] The clinical consequences of AF include increased risk of death, thromboembolic complications and heart failure (HF).[2] The increased mortality and morbidity associated with AF have triggered continuing research to explore the potential underlying mechanisms of this arrhythmia and to develop new treatment options.[1-5] There is a pathophysiological association between AF and left atrial (LA) electrical, structural and functional remodeling that occurs in response to several pathologic processes.[6-8] Left atrial structural remodeling is histologically characterized by the excessive deposition of extracellular matrix protein produced by fibroblasts and is specified as atrial fibrosis. Atrial fibrosis plays a significant part in the pathogenesis of AF through several mechanisms, including impaired electrical activity of myocytes, increased chamber stiffness and conduction abnormalities induced by fibrotic tissues.[8,9]

Cardiac imaging is of major importance in the assessment and management of AF. Recent advances in technology have increased the interest in LA structural and functional imaging. Late gadolinium enhancement-magnetic resonance imaging (LGE-MRI) is a recently established method for the evaluation of LA fibrosis. Indeed, one of the very first studies was conducted by the authors of an article mentioned in this editorial. In that study, the authors elegantly demonstrated that LGE-MRI allows the detection and quantification of LA fibrosis, thus structural remodeling, in patients with AF.[10]

Abbreviations:

AF	*Atrial fibrillation*
CAD	*Coronary artery disease*
HF	*Heart failure*
LA	*Left atrial*
LGE-MRI	*Late gadolinium enhancement-magnetic resonance imaging*
LV	*Left ventricular*
LVEF	*Left ventricular ejection fraction*

In the present study, the authors found that patients with AF and extensive LA fibrosis have depressed left ventricular (LV) systolic function, suggesting that structural remodeling in the LA may also trigger remodeling within the ventricular myocardium.[11]

Li et al.,[12] in a canine experimental model of AF, showed that LA fibrosis is a more prominent characteristic of HF than electrical remodeling.Very recently, Akkaya and his colleagues, in a clinical study, found a greater degree of LA fibrosis in AF patients with LV systolic dysfunction compared to patients with normal left ventricular ejection fraction (LVEF). Furthermore, in that study, patients with a lower de-

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gree of LA fibrosis achieved greater LVEF improvement after catheter ablation for AF.[13]

Several mechanisms could be responsible for the impaired LV systolic function in AF patients. As the authors commented in their manuscript, LA fibrosis is associated with generalized fibrosis of the LV in AF patients.[14] The data from Ling et al.,[15] support the present evidence and further demonstrate that there is an independent association between the degree of diffuse LV fibrosis and LVEF in AF patients. Interestingly, in a subset of isolated AF patients, Ling et al. showed diffuse LV fibrosis, suggesting that AF itself may independently contribute to adverse cardiac remodeling. Although the manuscript from Akkaya and his colleagues does not provide data about LV fibrosis, one can associate myocardial fibrosis with LV systolic function. Another interesting point of view could be that the diffuse LV myocardial fibrosis may also reflect the presence of an underlying cardiomyopathy that antecedes and contributes to the development of AF. However, it would be difficult to test this hypothesis in Akkaya et al.'s manuscript, as 20% of the study population had coronary artery disease, the presence of which was found as one of the significant parameters affecting LVEF.

In conclusion, MRI assessment of LA structural remodeling enables a refinement in the risk stratification of patients with AF. The association between the degree of LA fibrosis, interatrial septal thickness and LV systolic dysfunction is an important clinical issue that remains to be clarified in future studies.

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