Abstract

Atrial fibrillation is the most prevalent arrhythmia worldwide and remains one of the major causes of morbidity and mortality. Atrial fibrillation is an arrhythmia that has a various etiology and takes number of clinical forms. Due to the heterogeneity of atrial fibrillation, it is necessary to individualize the optimal treatment strategy, ie conservative pharmacological therapy or interventional therapy as catheter ablation. Incorrect indication of catheter ablation of atrial fibrillation leads to low success rate of the procedure and increases the risk of the procedure.

The success rate of catheter ablation of atrial fibrillation depends on many clinical parameters, including the size and volume of the left atrium and the presence of pathological tissue in the atrial myocardium. In everyday practice, echocardiography (2D-echocardiography) is the most dominant method in estimation of the left atrial parameters, for it’s simplicity, non-invasiveness, financial costs and the absence of ionizing radiation. Different methods for assessment of left atrial parameters are cardiac CT, cardiac magnetic resonance imaging and methods of 3-D echocardiography or 3-D angiography.

The results of the present studies show that in patients with non-valvular atrial fibrillation who are indicated for catheter ablation, there are dramatic differences in acquired volumes between routine echocardiographic methods and between echocardiography and volumetry for CT examination or electroanatomical mapping. Furthermore, the present work shows that the measured atrial volumes of the atrium may be dependent on the change in its shape during structural remodeling of the atrium, or may also be dependent on clinical indicators such as the presence of sinus rhythm.

Non-invasively evaluated atrial size and morphology parameters have their potential in predicting atrial wall fibrotization. Knowing the magnitude of the possible error of estimation of treatment success and the factors affecting it will allow a critical interpretation of the results of non-invasive diagnostic methods in routine clinical practice.