

Prediction of recurrence after cryoballoon ablation therapy in patients with paroxysmal atrial fibrillation

Introduction of pulmonary vein (PV) isolation was a milestone in the treatment of atrial fibrillation (AF). Efficacy of these procedures has been well documented (1), but it is still a matter of debate how to predict success or failure of PV ablation. Several predictors of AF relapse after ablation procedures have been suggested, including age and comorbidities, AF type and episode duration, electrocardiographic parameters, and biomarker levels (2–5). Much attention was paid to echocardiographic parameters providing an assessment of left atrial (LA) size and function. It was shown that an increased LA volume (6, 7) and LA mechanical dyssynchrony (3, 8, 9) were independent predictors of AF recurrence after catheter ablation. However, different echocardiographic techniques were used in these studies, and they also differed in terms of study design and definitions of recurrence.

The study by Gerede et al. (10) entitled “Prediction of recurrence after cryoballoon ablation therapy in patients with paroxysmal atrial fibrillation” published in this issue focuses on assessment of LA function, measured by Doppler echocardiography, for the prediction of AF relapse after PV cryoablation in patients with paroxysmal AF. Transthoracic and transesophageal echocardiography was performed prior to ablation. In addition to conventional echocardiographic parameters, LA appendage emptying peak flow velocity (LAAV) and PV systolic and diastolic wave velocity were obtained. Attention was paid to the presence of LA spontaneous echo contrast (LASEC) and mitral annulus calcifications (MAC). During the 1-year follow-up, AF recurrence was noted in 16 of 51 patients who underwent PV cryoablation. The main findings of the study indicate that a low LAAV of <30 cm/s, presence of MAC and LASEC, increased LA diameter, and low peak PV systolic wave velocity were independent predictors of AF relapse after ablation. These results largely confirm the results of previous studies, but Gerede et al. (10) were the first to show that low LAAV and low PV systolic wave velocity were associated with a higher risk of AF recurrence over a long-term period after PV cryoablation. The mechanism of lower peak PV systolic wave velocity has not been discussed, but it may indicate reduced LA compliance and probably higher LA pressure in patients with AF relapse after ablation. Results of the study by Gerede et al. (10) are consistent with other observations that the larger LA size and the worse its function, the higher is the risk of AF recurrence after ablation.

Regarding effectiveness of ablation, accurate and reliable echocardiographic parameters are needed to determine the

presence and extent of LA remodeling in AF patients referred for ablation. For this purpose, both conventional echocardiography and tissue Doppler imaging (TDI) or speckle-tracking strain analysis were used (3, 11–14). However, a disadvantage of the Doppler technique is its angle dependence, as it only can be used along the direction of the Doppler beam. It would be interesting to know to what extent the data provided by Doppler examination, as in the study by Gerede et al., would be reflected by speckle-tracking analysis, which is angle-independent. More research is needed, probably with different and complementary echocardiographic techniques, to establish accurate predictors of a success or failure of PV isolation for the treatment of AF.

Ewa Lewicka

Department of Cardiology and Electrotherapy, Medical University of Gdansk; Gdansk-Poland

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Address for correspondence: Ewa Lewicka, MD, Department of Cardiology and Electrotherapy
Medical University of Gdansk, Debinki 7, 80-952 Gdansk-Poland
Phone: +48 58 349 39 10 Fax: +48 58349 39 20 E-mail: elew@gumed.edu.pl

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