

Atrial strain performance in patients with paroxysmal atrial fibrillation undergoing successful radio-frequency catheter ablation

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Background: Radio-frequency catheter ablation (CA) is associated with changes of left atrial (LA) structure and function. However, there is limited knowledge regarding the long-term impact of successful CA on atrial morphology and mechanics.

Purpose: To compare the time course of LA and right atrial (RA) performance in patients with paroxysmal atrial fibrillation (AF) undergoing the first CA.

Methods: This prospective study included 89 consecutive patients (age: 62 ± 21 years; 66% male) with a history of symptomatic AF who underwent successful CA. All patients maintained SR during follow-up. A comprehensive echocardiographic examination was performed 1-day before and 1-day, 3-month and 12-month after CA. The reservoir and contractile strain for both LA and RA (LAS, RAS), and left intra-atrial mechanical dispersion (LAMD) were assessed using 2D speckle tracking echocardiography in all three apical views (only 4CH view for RAS and LAMD).

Results: At baseline, all patients with paroxysmal AF showed a significant reduction of reservoir and contractile LAS and RAS compared with controls (all $p < 0.01$). CA was associated with a significant decrease in reservoir and contractile LAS while no significant difference was observed for RAS. At 3-month follow-up, the LAS showed full recovery, whereas the RAS did not show any significant change from 1-day post CA values. At 12-month follow-up, both reservoir and contractile LAS showed further improvement compared to baseline and 3-month values. LAMD derived from the LA strain curve followed a similar trend. Although the RA motion was not affected in the early phase, both reservoir and contractile RAS showed a significant increase between 3-month and 12-month follow-up.

Conclusion: Although the radio-frequency CA affected negatively LA performance in the acute phase, it has a long-term positive impact on both left and right atrial function.

Figure: Time course of reservoir and contractile LAS and RAS at Baseline, 1-day, 3-month and 12-month follow-up.

Abstract Figure.

