Acute change in left atrial performance in patients with atrial fibrillation undergoing catheter ablation using AutoStrain

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Background: Radio-frequency catheter ablation (CA) is associated with changes of left atrial (LA) structure and function. However, the data on the accuracy of automated analysis of LA strain (LAS) are unavailable. Therefore, the aim of the present study was to compare automated with manual LAS analysis in patients with atrial fibrillation (AF) undergoing CA during sinus rhythm.

Methods: We prospectively enrolled 36 consecutive patients (age: 62 ± 22 years, 33% female) with symptomatic AF and preserved left ventricular (LV) ejection fraction (≥50%) undergoing the CA during sinus rhythm. All patients underwent comprehensive echocardiography at 1-day pre-CA and at 1-day post-CA. Reservoir and contractile LAS were assessed using both the automated and the manual technique as average of segmental values in apical four-chamber (4CH) view using the onset of QRS as a reference point.

Results: Radio-frequency CA was associated with significant decrease in magnitude of reservoir and contractile LAS in all patients, and increase in LA end-systolic (max) and end-diastolic (min) volume index (all $p < 0.001$) (figure 1). The correlation between (semi-) automated and manual LAS assessment was excellent in all measurements (figure 2). The manual correction was needed in 7 out of 36 patients (19%). Despite this, the time needed to perform AutoStrain-derived analysis was significantly lower than the time needed for the manual LAS analysis (12 ± 3 ms vs. 40 ± 5 ms, $p < 0.01$). Moreover, in 10 randomly selected patients, the AutoStrain showed significantly lower interobserver variability than the manual LAS analysis (3.1% vs. 6.7%, $p < 0.01$).

Conclusion: The AutoStrain-derived LAS analysis showed a high correlation with manual LAS analysis. Moreover, the AutoStrain technique was associated with significantly shorter analysis time and lower interobserver variability compared with the manual technique.

Abstract Figure.