**Abstract:** P2451

**Patterns of left atrial structural and functional remodeling after catheter ablation in paroxysmal and long-standing persistent atrial fibrillation**

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**Topic(s):**
Tissue Doppler, Speckle Tracking and Strain Imaging

**Citation:**
Background: Both atrial fibrillation (AF) and catheter ablation (CA) may be associated with changes in left atrial (LA) structure and function. However, the data describing acute and short-term effects of CA on LA contractile function in different sub-types of AF are scarce.

Purpose: First, to describe patterns of LA structural and functional remodeling in patients with paroxysmal AF (PAF) or long-standing persistent AF (LSPAF) undergoing first or redo CA. Second, to assess clinical feasibility of LA strain and strain rate (SR) to monitor effect of AF and CA on LA contractile function.

Methods: We prospectively enrolled 138 consecutive patients (age: 63±21 years, 32% females) with PAF undergoing first (81%) or redo (19%) CA during sinus rhythm, and 20 individuals (age: 66±23 years, 20% females) with LSPAF undergoing first CA during AF. All patients were symptomatic and preserved (=50%) left ventricular ejection fraction. Control group consisted of 23 healthy controls. All patients underwent comprehensive echocardiography one day pre-CA and post-CA, and at 3 month follow-up. The LA reservoir, conduit and contractile longitudinal strain (LAS) and LASR were assessed using 2D speckle tracking echocardiography as average of segmental values in apical views.

Results: A total of 14 (9%) patients had insufficient image quality for LA assessment and were excluded (feasibility: 91%). Pre-CA, patients with LSPAF showed the largest left atrial volume index (LAVI) (45±14 ml/m²), followed by PAF (35±8 ml/m²) and controls (24±10 ml/m²) (p<0.001). The lowest reservoir and contractile LAS was observed in patients with LSPAF (12±5% and 0%), followed by PAF undergoing redo CA (22±7% and 9±4%), versus first CA (27±8% and 13±4%) and controls (37±7% and 16±4%) (p<0.001). LASR followed similar trend. Post-CA, we observed acute increase of LAVI in all groups (figure 1). Reservoir and contractile LAS and LASR decreased only in patients with PAF who underwent first CA. In contrast, it remained unchanged in individuals with PAF who had redo CA or even increased in subjects with LSPAF (figure 2). At 3 month follow-up, LAVI was significantly reduced compared with baseline in all groups of patients with AF (p<0.01). In contrast, LAS and LASR did not show uniform improvement in all AF groups and on average they remained significantly lower compared with controls (p<0.01). The lowest LAS and LASR values were observed in patients with PAF who underwent redo CA (no improvement from baseline) and in patients with LSPAF (significant improvement versus baseline) (figure 2). Patients with PAF who had the first CA showed higher LAS and LASR compared with other two AF groups (p<0.01) but still significantly lower than controls (p<0.01).

Conclusion: Different sub-types of AF show different patterns of LA structural and functional remodeling after CA. Both reservoir and contractile LAS appear highly feasible and reproducible to monitor LA contractile function in this clinical setting.
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Conclusion: Different subtypes of AF show different patterns of LA structural and functional remodeling after CA. Both reservoir and contractile LAS appear highly feasible and reproducible to monitor LA contractile function in this clinical setting.

Figure 1: figures (1A,1B) showing the value and time course of LA volume index (pre-ca, post-ca and at 3 m FU) for 3 groups of patients.

Figure 2: figures (2A,2B) showing the value and time course of LA contractile strain (pre-ca, post-ca and at 3 m FU) for 3 groups of patients.