Atrial remodelling following catheter ablation for AF-mediated cardiomyopathy: long-term follow up of CAMERA MRI study

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Introduction: Catheter ablation (CA) is successful in restoring ventricular function in patients with atrial fibrillation and cardiomyopathy as shown in the CAMERA-MRI study. We sought to determine if recovery of LV function with the restoration of sinus rhythm was associated with improvements in atrial electrical changes in a subgroup from the CAMERA-MRI study.

Methods: Detailed electroanatomic (EA) mapping of the right atrium (RA) using force sensing catheter during CS pacing was performed at the time of initial CA. An elective RA EA map was performed in willing participants a minimum of 12 months following successful CA. Bipolar voltage, fractionation and conduction velocity were collected in 4 segments (Anterior, Lateral, Posterior and Septal) together with echo and cardiac MRI.

Result: Fifteen patients (mean age 59.1±6.8 yrs with an average AF burden of 0.6% (range 0-3%) post CA underwent detailed RA EA mapping at the index procedure and at 23.4±11.9 months following successful CA. LVEF improved from 32.6±13.3% to 56.6±7.8% (P <0.001), RA area decreased from 28.4±7.2 cm² to 20.6±4.3 cm² (P<0.001) and LA area decreased from 32.9±8.2 cm² to 26.8±5.2 cm² (P=0.007). On EA mapping, RA bipolar voltage increased from 1.6 ± 0.1 mV at CA to 1.9±0.1 mV (p=0.04). Atrial low voltage areas decreased from 19.7±11.8% to 14.2±12.5% (p=0.073) with a significant decrease in fractionation from 21.7±13.7% to 8.3±7.3% (p=0.002).

Conclusion: Recovery of atrial electrical and structural changes was observed following restoration of sinus rhythm and recovery of LV function in patients undergoing CA for persistent AF and LV systolic dysfunction.