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LEFT ATRIAL RESERVOIR FUNCTION PREDICTS ATRIAL FIBRILLATION RECURRENCE AFTER CATHETER ABLATION: A TWO-DIMENSIONAL SPECKLE STRAIN STUDY

ACC Poster Contributions
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Background: Predictors of atrial fibrillation (AF) recurrence after catheter ablation (CA) are not fully defined. We hypothesized that 2-D left atrial (LA) regional strain maps would help differentiate patients who maintain sinus rhythm post CA from those with AF recurrence.

Methods: A series of 75 patients (62±9 yrs, 49 males) underwent CA for symptomatic paroxysmal (n=54, 72%) or persistent (n=21, 28%) AF. LA mechanical function was characterized before CA using speckle tracking echocardiography. 2-D maps of LA wall velocity, longitudinal strain (LS) and strain rate (SR) were obtained from the septal, posterior and lateral walls during end-ejection (reservoir phase) and early diastole (conduit phase).

Results: After 18±12 months follow-up post CA, 42 (56%) of patients remained free of AF. Despite the older age of patients who had recurrence of AF after CA (65±7 vs. 60±10 yrs, p=0.03), overall LA and LV volumes, Doppler estimates of LV diastolic function and LV filling pressures were similar. On comparing patients with normal LV ejection fraction (>55%) from each group (n=35, 55% for no recurrence vs. n=29, 45% for recurrence), the LA total emptying fraction was reduced in patients with recurrent AF (55±16 vs. 64±14% p=0.02), and LA reservoir and conduit functions were markedly attenuated. Peak LS, SR and radial systolic velocities from the lateral wall segments were significantly diminished (20±14 vs. 11±7%, p=0.003 for LS; 1.2±0.7 vs. 0.8±0.4 .s-1, p=0.01 for SR and 5.2±1.9 vs. 4.0±1.4 cm/s, p=0.01 respectively). Multivariate logistic regression analysis revealed lateral wall LS (odds ratio 0.93, 95% CI 0.87 to 0.99, p=0.03) as the only independent predictor of absence of AF recurrence.

Conclusions: Left atrial lateral wall regional longitudinal strain is a key pre-procedural determinant of AF recurrence in patients undergoing catheter ablation, independent of LA size and volume. Characterization of atrial myocardial tissue properties by speckle tracking echocardiography may aid appropriate selection of therapeutic strategies and prognostication of patients being considered for AF ablation.