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EVALUATION OF THE LEFT ATRIAL SUBSTRATE AND AGE IN ATRIAL FIBRILLATION PATIENTS USING DELAYED-ENHANCEMENT MRI

ACC Poster Contributions

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Background: We sought to evaluate the relationship between left atrial (LA) volume and the various stages of structural remodeling (SRM) in atrial fibrillation (AF) patients.

Methods: 174 patients underwent delayed-enhancement MRI (DE-MRI). The epicardial and endocardial borders were manually contoured using image display and the relative extent of remodeling was quantified within the LA wall using a threshold-based algorithm. Patients were then classified into three categories <50 years old, between 50-70 years old, and >70 years old. Patients were divided into categories based on age (<40; 40 - 50; 50 - 60; 60 - 70; 70 - 80 and >80) and then compared to the extent of LA enhancement seen on DE-MRI. Patients were also placed in three categories based on LA structural remodeling; Stage 1 SRM (<15% LA wall enhancement), Stage 2 SRM (15-35% LA wall enhancement) and Stage 3 SRM (>35% LA wall enhancement). The mean age within each SRM category was then calculated.

Results: AF patients less than 50 years old had $11.6 \pm 6.8\%$ enhancement compared to $19.3 \pm 13.9\%$ enhancement in patients >70 ($p = 0.021$). Patients with Stage 3 SRM (late-stage) were more likely to be older (68.6 ± 11.9) compared to patients with Stage 2 (63.7 ± 12.3) and Stage 1 SRM (63.2 ± 12.1).

Conclusion: Substrate analysis using DE-MRI confirms that aging plays an integral component in LA remodeling in AF patients.

Table				
	<40 yrs old	40 - 50	50 - 60	60 - 70
Volume	61.6 ± 26.6	111.1 ± 54.1	108.2 ± 43.7	106.9 ± 41.7
LA Enhancement	7.9 ± 5.3	13.1 ± 6.9	16.2 ± 9.9	18.6 ± 13.1
	<50 years old		50 - 70 years old	
Volume	96.3 ± 52.2		106.3 ± 42.2	
LA Enhancement	11.6 ± 6.8		18.1 ± 12.1	