



ACC.15

TCT@ACC-12 | innovation in intervention

A310
JACC March 17, 2015
Volume 65, Issue 10S

Arrhythmias and Clinical EP

ELECTROPHYSIOLOGICAL IMPLICATIONS OF LEFT ATRIAL WALL THICKNESS RELATED TO COMPLEX FRACTIONATED ELECTROGRAM, VOLTAGE AND CYCLE LENGTH

Poster Contributions

Poster Hall B1

Saturday, March 14, 2015, 10:00 a.m.-10:45 a.m.

Session Title: What's Going On in the World of Atrial Fibrillation?

Abstract Category: 4. Arrhythmias and Clinical EP: AF/SVT

Presentation Number: 1115-245

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Background: Atrial scars are strongly related to slow anisotropic conduction. Their relationship to atrial thickness has not yet been investigated. This study sought to evaluate the relationship between left atrial wall thickness (LAWT) imaged by multidetector computer tomography (MDCT) and arrhythmia substrate in atrial fibrillation (AF).

Methods: Atrial MDCT of 20 patients with AF (12 persistent AF) was registered with mapping geometry (NavX electro-anatomical system, version 8.0, St. Jude Medical, St. Paul, Minnesota). Left atrium (LA) was divided as 28 sites in every patients, total available 539 sites were analyzed. The fractionation, local mean cycle length (MCL) and voltage of LA were analyzed with regard to LAWT.

Results: There were large variations in LAWT (median: 1.77 mm, range 0.77-4.17 mm), LA voltage (median: 0.15 mV, range 0.02-6.01 mV) and local MCL (median : 180.87 ms, range 51.53-825.67 ms). LAA base had the thickest LAWT (2.27±0.51mm), the highest voltage (1.26±1.37 mV) and the shortest MCL (169.35±176.93 ms). In contrast, posterior wall showed the thinnest LAWT (1.66 ± 0.43mm) and the lowest voltage (0.43 ± 0.82 mV), and the floor of LA showed the longest MCL (384.41 ± 177.80 ms). LAWT was thinner in areas without than in those with complex fractionated electrogram (1.71 ± 0.42 vs. 2.38 ± 0.65 mm, p<0.001). There was negative correlation between LAWT and local MCL (r=-0.116, p=0.019). Finally, LAWT was significantly thinner in areas (n=206) with low voltage (< 0.1 mV) than those (n=333) with high voltage 0.1 mV (1.82 ± 0.55 vs. 1.93 ± 0.58 mm, p=0.04).

Conclusion: Thin LAWT was associated with low LA voltage, long local MCL and less complex fractionated electrogram. These findings suggest that the structural remodeling is related with functional change of atrial substrate in patients with AF.