observed a significant difference: 9.8 ±5.3 vs 7.3 ±3.9 Ohms p < 0.01 (Fig 2).
Conclusion: Contact force had an important residual impact on impedance drop in high AI lesions (> 400) but not in low AI lesions (< 400). This may be due to differences in conductive versus resistive heating requirements. Ablation Index using a fixed formula for duration, force, and power, may not accurately predict lesion formation throughout all value ranges and optimization of adequate contact force remains important for larger and deeper lesions.

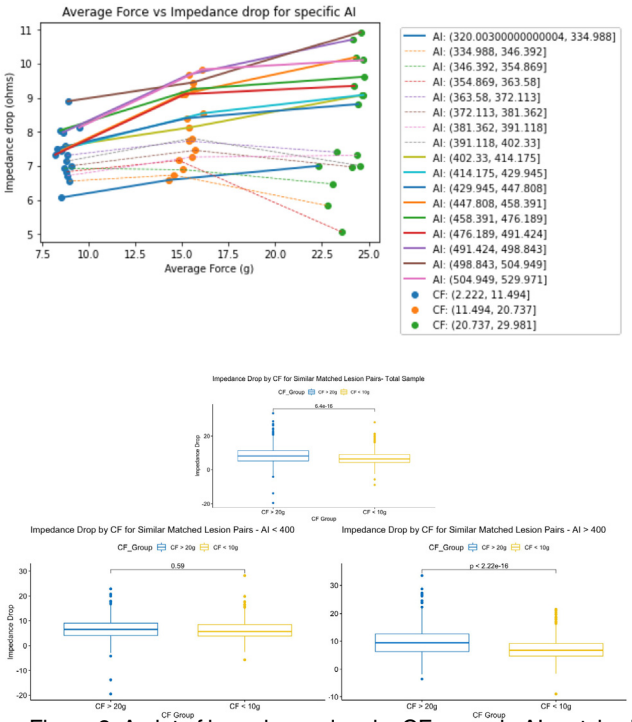


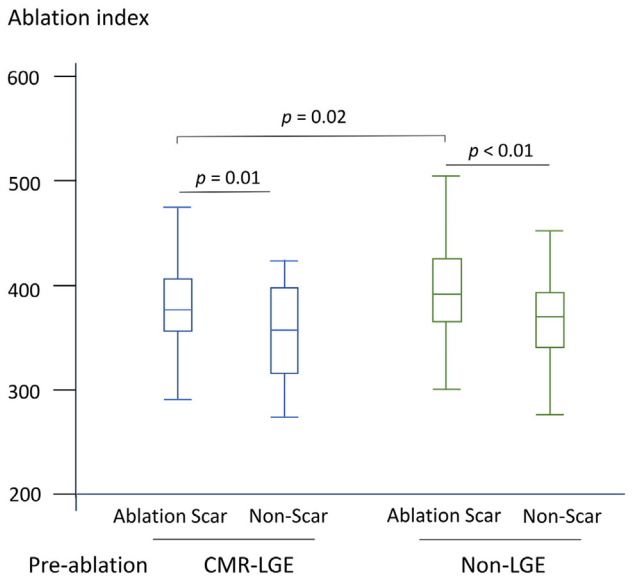
Figure 2: A plot of impedance drop by CF group in AI matched pairs. A significant difference is seen for the overall sample and pairs with AI > 400.

CA-530-02

LOWER ABLATION INDEX IS REQUIRED FOR POST-ABLATION DENSE SCAR FORMATION AT THE LEFT ATRIAL POSTERIOR WALL REGIONS WITH MRI-LATE GADOLINIUM ENHANCEMENT

Dan L. LI MD; Yichi Zhang BS; Tarek ayoub MD; Abdel Hadi El Hajjar; Chao Huang PhD; Charbel Noujaim MD, MS; Mario Mekhael and Nassir F. Marrouche MD, FHRS

Background: Late gadolinium enhancement in magnetic resonance imaging (MRI-LGE) at the left atrial posterior wall (LAPW) is a surrogate of fibrotic remodeling and is often targeted in persistent atrial fibrillation (PrAF) ablation. It is unclear whether ablation efficacy differs between regions with and without LGE at the LAPW.
Objective: We aim to study the association of ablation index (AI) and post-ablation transmural scarring, in regions with pre-ablation MRI-LGE vs regions without.
Methods: A total of 14 PrAF patients who underwent pulmonary vein isolation and posterior wall debulking were included, and a total of 493 ablation lesions were analyzed. All patients had a pre-ablation MRI and a 3-month post-ablation MRI. Electroanatomic (EA) map was co-registered with pre-ablation MRI to delineate the posterior wall regions with and without LGE, respectively. EA map was then co-registered with post-ablation MRI to delineate regions of transmural scar by ablation. Ablation lesion parameters were collected within each region.
Results: Post-ablation dense scar formation was observed in 97.7% area of regions with LGE vs. 55.6% of regions without LGE ($p = 0.003$). Post-ablation dense scarring was associated with ablation lesions that had higher AI, in both regions with ($p < 0.01$) and without LGE ($p = 0.01$). However, the AI required to achieve dense scar was significantly lower in regions with LGE seen on pre-ablation MRI compared to regions without LGE (median AI with IQR: 379 (359,407) vs 393 (366,426), $p = 0.02$, MRI-LGE vs non-LGE). (Figure)
Conclusion: Effective ablation lesion is more feasible in LAPW regions with fibrotic remodeling demonstrated by pre-ablation MRI-LGE. Tailored AI-guided LAPW ablation may of benefit to achieve adequate lesions while minimizing collateral heat injury due to excessive ablations.



CA-530-03

TAILORED ABLATION INDEX BASED ON LEFT ATRIAL WALL THICKNESS ASSESSED BY COMPUTED TOMOGRAPHY FOR PULMONARY VEIN ISOLATION IN PATIENTS WITH ATRIAL FIBRILLATION

So-Ryoung Lee MD; Eue-Keun Choi MD, PhD; Hyoungseob Park MD and Seil Oh MD, PhD, FHRS

Background: Although left atrial wall thickness (LAWT) is known to be diverse, fixed target Ablation Index (AI) value has been recommended in radiofrequency catheter ablation (RFCA) of pulmonary vein isolation (PVI) in patients with atrial fibrillation (AF).
Objective: To evaluate the efficacy of tailored ablation for PVI based on LAWT assessed by cardiac computed tomography (CT).
Methods: LAWT was evaluated by cardiac CT. The thick segment was defined as the segment including ≥LAWT grade 3 (≥1.5 mm) among 14 prespecified pulmonary vein (PV) segments (Figure A). Using SmartTouch SF catheter (Biosense Webster Inc., CA, US), point-by-point ablation was delivered at 40W on the anterior/roof segments and 25-35W on the posterior/inferior/carina segments. In the fixed AI group, AI targets were 450 on the anterior/roof segments and 350 on the posterior/inferior/carina segments regardless of LAWT. In the tailored AI

group, AI targets were increased to 500 on the anterior/roof segments and 400 on the posterior/inferior/carina segments when ablating the thick segment. After PVI, acute reconnection defined by the composite of residual potential and early reconnection was evaluated.
Results: A total of 156 patients (mean age 60±9 years, men 73%, and paroxysmal AF 72%) undergone AF RFCA using AI-guided PVI were consecutively included (86 for fixed AI group and 70 for tailored AI group). There were no significant differences in the baseline characteristics of the two groups. In the tailored AI group, 57 patients (81.4%) had at least one thick segment (mean 2.7±2.1 segments among prespecified 14 PV segments). The prevalence of thick segments among 14 PV segments is presented in Figure B. Tailored AI group showed a significantly lower rate of segments with acute reconnection than the fixed AI group (8% vs. 5%, p=0.007). Tailored AI group showed a trend for shorter ablation time for PVI between the two groups (36±8 min for tailored AI group vs. 39±8 min for fixed AI group, p=0.051). There was no significant procedure-related complication in both groups.
Conclusion: Applying tailored AI based on the LAWT was a feasible and effective strategy to reduce acute reconnection after PVI. Further investigation is needed to identify the long-term efficacy and safety of tailored AI strategy in AF RFCA.

Figure A. Example of LAWT map

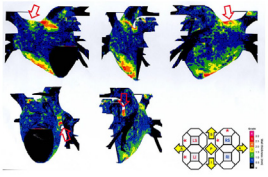
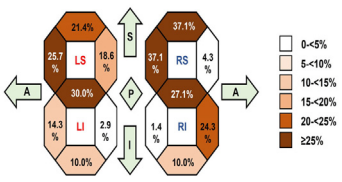


Figure B. Prevalence of thick PV segments

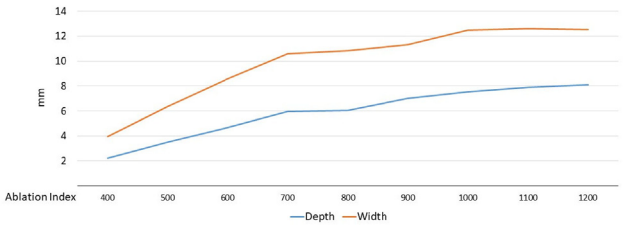


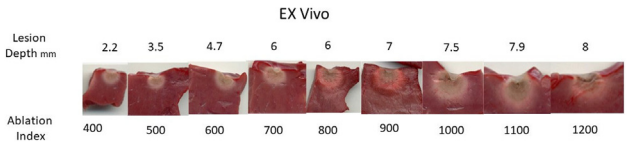
CA-530-04

UTILITY OF ABLATION INDEX FOR GUIDING ABLATION IN VENTRICULAR TISSUE

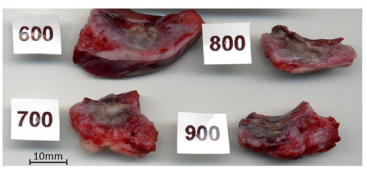
Israel Zilberman DVM; Arwa Younis MD; Hagai Yavin MD and Elad Anter MD

Background: Ablation index (AI) is a widely used variable incorporating power, time, and contact force for predicting lesion size for radiofrequency ablation (RFA). Its utility for guiding ablation in ventricular tissue, and particularly in clinically relevant scar tissue, has not been studied.
Objective: To examine the utility and limitations of AI for predicting lesions dimensions in healthy and scarred ventricular tissue.
Methods: This study included three steps: 1) In an ex-vivo bath model of fresh porcine hearts, RFA was performed using Thermocool STSF® (Biosense Webster) at a fixed power of 30W and an AI value range of 400-1200 at increments of 100; 2) In an in-vivo beating heart model of healthy porcine, RFA was performed at an AI value range of 500-900 at increments of 100; 3) in an in-vivo beating heart model of healed anterior wall infarction, RFA at an AI value range of 600-900 was performed at scar border zone defined by low voltage and abnormal electrograms. The relationship between AI and lesions dimensions was analyzed.
Results: In ex-vivo hearts, lesion width and depth had positive correlation with AI values (R=0.97, P<0.01; R=0.96, P<0.01, respectively). The relationship between lesion width and depth was linear between AI values of 400-900 (Width 1.4mm/100; Depth 0.9mm/100) but became flatter at 900-1200 (Width 0.05mm/100; Depth 0.28mm/100) as shown in Figure 1. In healthy beating ventricles, a similar positive correlation between AI values and lesions width and depth was observed (R=0.99, P<0.01; R=0.97, P<0.01, respectively) with 90% of lesion depth achieved at an AI value of 900. In contrast, AI did not correlate with lesion depth at infarcted myocardium (R=-0.23, P=0.74). Furthermore, lesion architecture was influenced by the spatial relationship between viable and scarred myocardium, with lesion growth-restricted predominantly to viable myocardium superficial to the infarct. Figure 2 shows gross pathological examples of lesions at variable AI values in healthy and scarred ventricular myocardium.
Conclusion: In healthy ventricle, AI has a positive correlation to lesion dimensions with submaximal depth achieved at an AI value of 700. However, in scarred myocardium, AI has a poor correlation to lesion dimensions, with lesion growth restricted to viable myocardium superficial to the infarct.





Healed Infarcted Tissue (Scar)



ABSTRACT CE-522:
Ventricular Tachycardia: Prediction, Outcomes, and Treatment

Friday, April 29, 2022

2:15 PM - 3:15 PM

CE-522-01

COMPARISON OF THE EFFICACY OF BI-V VS RV BURST ATP IN TERMINATING VT IN PATIENTS WITH NON-ISCHEMIC VS ISCHEMIC CARDIOMYOPATHY

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Background: Anti-tachycardia pacing (ATP) is effective at terminating reentrant ventricular tachycardias.
Objective: We sought to assess whether there is a difference in the efficacy between Bi-V vs RV only ATP in patients with non-ischemic compared to ischemic cardiomyopathy.