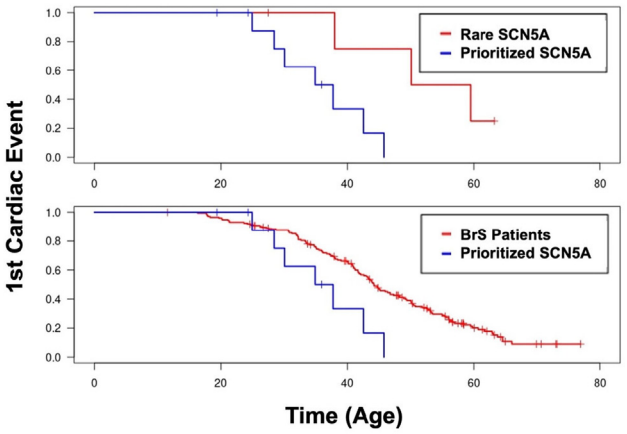
signature type I ECG was present in 160 mutation carriers (BrS-ECG+; 53%). In 42 families, we found 33 individuals affected by BrS but with a negative genotype (mutation-negative BrS-ECG+). Among them, 5 patients have an ECG suggestive of BrS but without the complete signature type I ECG. Among these 33 mutation-negative BrS-ECG+ individuals, 3 (9%), belonging to 3 different families, had a spontaneous type I ECG, whereas 28 had a type I ECG only after the administration of sodium channel blockers. Three of these 33 individuals (9%) had also experienced syncope. Mutation carriers had, on average, longer PR (190 ± 36 ms vs 154 ± 29 ms, p<0,0001) and QRS (107 ± 19 vs 92 ± 29 ms, p<0,0001) intervals than noncarriers, demonstrating that these mutations exerted functional effects.
Conclusion: Our results suggest that SCN5A mutations are not directly causal to the occurrence of a BrS-ECG+ and that genetic background may play a powerful role in the pathophysiology of BrS. These findings are consistent with the notion that the pathophysiology of BrS includes various elements beyond mutant sodium channels.

BS-513-04

BURDEN AND CLINICAL CHARACTERISTICS OF THAI BRUGADA SYNDROME PATIENTS CARRYING RARE *SCN5A* VARIANTS OF UNCERTAIN SIGNIFICANCE

John Mauleekoonphairoj MSc; Apichai Khongphatthanayothin; Roddy Walsh; Boosamas Sutjaporn; Pharawee Wandee; Arthur A.M. Wilde MD, PhD; Yong Poovorawan; Connie R. Bezzina PhD and Koonlawee Nademanee MD, FHRS, CCDS

Background: Loss-of-function variants in the sodium channel α-subunit (*SCN5A*) are associated with Brugada Syndrome (BrS). As Southeast Asians are understudied, the detected variants often lack supporting evidence and are absent in current clinical databases. This creates a challenge as variant interpretation resulted in over 90% of rare variants detected being classified as variants of uncertain significance (VUS) according to ACMG guideline.
Objective: To investigate the burden of rare *SCN5A* variants in Thai BrS patients and to examine the clinical characteristics of BrSpatients with rare *SCN5A* variants.
Methods: Burden testing was performed on 196 cases and 394 controls. Rare variants, with allele frequency in gnomAD database (AF < 0.001), were included. Testing was further performed on variants prioritized with CADD score, a measure of variant deleteriousness (CADD>25). Clinical characteristics of Brugada Syndrome patients with rare *SCN5A* variants were assessed.
Results: Rare *SCN5A* variants are associated with Thai BrS cases (p= 0.04, 8.16% vs 3.04%). An enrichment of prioritized variants was observed in BrS cases (p= 2.31x10-(5), 5.61% vs 0.5%). No significant differences were found in clinical characteristics of patients with and without rare *SCN5A* variants. However, patients with prioritized *SCN5A* variants (n=11) showed significantly earlier age-onset of first cardiac event when compared to patients with rare *SCN5A* variants (p < 0.02, upper figure) and other BrS cases in the cohort (p < 0.01 lower figure).
Conclusion: BrS patients carrying *SCN5A* variants predicted to be deleterious show earlier age-onset of first cardiac event. The variable clinical characteristic in patients with rare *SCN5A* and prevalence of rare *SCN5A* variants in controls suggests that interpreting rare variants must be done with caution, especially in understudied populations where supporting evidence is limited. Further studies are needed for using prioritized *SCN5A* variants to aid in the diagnosis or prognostication of patients with BrS.



ABSTRACT CA-530:
Delivering Durable Lesions: Utilizing Surrogates to Guide Ablation in the Atrium and Ventricle

Friday, April 29, 2022
2:15 PM - 3:15 PM

CA-530-01

USE THE FORCE: ADEQUATE CATHETER CONTACT FORCE IS CRITICAL FOR HIGH QUALITY LESIONS GUIDED BY ABLATION INDEX

Omar Kreidieh MD; Clinton J. Thurber MD; John Whitaker BCH, BM, PhD; Nathaniel Steiger MD; Uyanga Batnyam MD; David Chang MD; Sunil Kapur MD; Thomas M. Tadros MD, MPH; Bruce A. Koplan MD, MPH, FHRS; Usha B. Tedrow MD, MS, FHRS; William H. Sauer MD, FHRS, CCDS and Paul C. Zei MD, PhD, FHRS

Background: Ablation Index (AI) is a measure used to estimate lesion size based on power, contact force (CF), and lesion duration. Ideally, AI-guided titration of lesion duration corrects for variations in contact force. Impedance drop is a validated measure that correlates well with lesion formation. Therefore, analysis of the relationship between AI, CF, and impedance drop may offer insight into possible residual influences of CF on lesion formation.
Objective: To investigate and characterize the impact of CF on impedance drop during AI-guided ablation.
Methods: We retrospectively reviewed atrial fibrillation ablation cases (AFAs) performed at a single center. We examined the correlation between CF and Impedance drop within narrow ranges of AI (17 groups). In a secondary analysis, we matched lesion pairs with high and low CF (< 10 g and > 20 g) for stability, AI, lesion location, and power. Matched pairs were compared using a t-test.
Results: There were 13444 lesions with AI between 320 and 530 from 91 AFAs. For lesions that had a low AI (< 402.3), we observed mostly no residual correlation between contact force and impedance drop (Fig 1). For lesions with high AI (> 402.3), we observed a consistent significant correlation between CF and impedance drop (Fig 1).
In the matched sample, the high CF group had a greater impedance drop when compared to the low CF group: 8.5 ±5.3 vs 7.0 ±4.0 Ohms p < 0.01 (Figure 2), despite having similar AI. When examining the subset of matched pairs with AI < 400, we observed no significant difference in impedance drop between the high and low CF groups: 6.7 ±4.7 vs 6.5 ±4.1 Ohms (p = 0.6). When examining the matched pairs with AI > 400, we again

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.

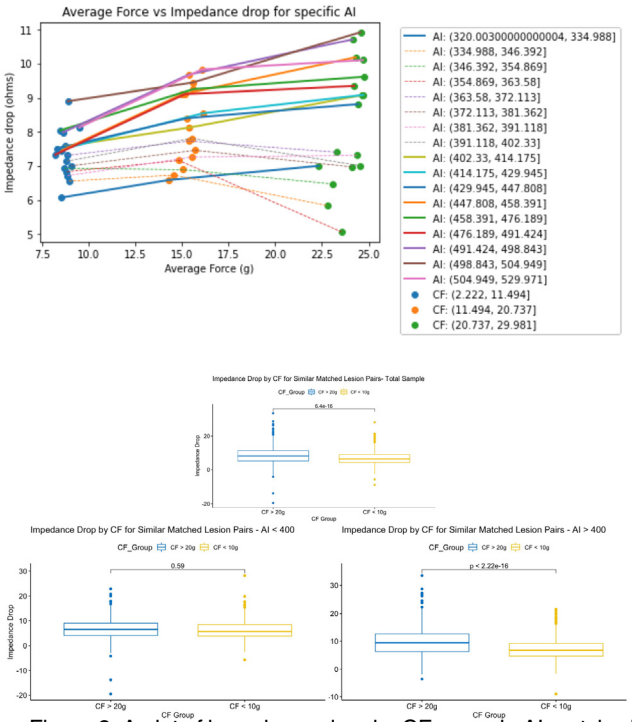


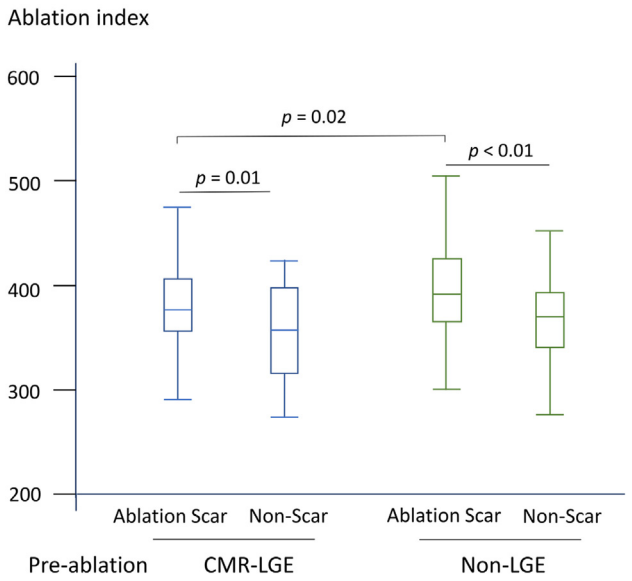
Figure 2: A plot of impedance drop by CF group in AI matched pairs. A significant difference is seen for the overall sample and pairs with AI > 400.

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