Results: Among 18 patients, there were 6 focal (3 RA, 2 LA, 1 bi-atrial) and 14 re-entrant (5 RA, 9 LA) ATs. A prior atrial ablation procedure had occurred in 17% of focal and 50% of re-entrant cases. Concurrent ablation of another atrial arrhythmia was performed in 83% of focal and 57% of re-entrant cases. LAT histograms in focal ATs displayed a “valley-and-plateau” morphology and contained the full tachycardia cycle length (TCL) in 70% of cases, while LAT histograms in re-entrant ATs had a “peak-and-valley” pattern, including the full TCL in 93% of cases. In all instances, isochrones with fewest total points (“LAT valleys”) corresponded to areas of earliest activation and critical isthmuses in focal and re-entrant ATs, respectively (Fig 1). Ablation in these areas was acutely successful in all but 1 re-entrant AT (95%), in which vein of Marshall ETOH ablation was required for termination.

Conclusion: The LAT histogram morphology and TCL duration can help distinguish focal from re-entrant arrhythmias and guide ablation strategy. Further investigation is needed to validate its utility and role.

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RELATIVE UTILITY OF OMNIPOlar SUBSTRATE MAPPING FOR VENTRICULAR TACHYCARDIA ABLATION

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Background: EnSite Omnipolar mapping (Abbott, Abbott Park, IL, USA) is a novel method of directionally optimized, high density, bipolar electrogram creation with integrated local conduction velocity annotation. Established electroanatomic mapping techniques for substrate mapping for ventricular tachycardia (VT) ablation includes voltage mapping, isochronal late activation mapping (ILAM), and fractionation mapping. The relative utilities of these mapping techniques is unknown.

Objective: To evaluate the relative utility omnipolar mapping for identification of critical sites for scar-related VT

Methods: Electro-anatomic substrate maps were created using the Advisor™HD Grid catheter (Abbott, Abbott Park, IL, USA) and retrospectively analyzed in 27 patients in whom 33 VT critical sites were identified. Critical sites were identified by termination of VT with ablation, entrainment mapping, or prolonged stim-QRS interval with matching pace-map.

Results: Both abnormal bipolar voltage magnitude and omnipolar voltage encompassed all critical sites and were observed over a median 66(IQR: 41.3-86) cm² and 52 (IQR 37.7-65.5) cm², respectively. ILAM deceleration zones were observed over a median 9 (IQR 5.0, 11.1) cm² and encompassed 22 (67%) critical sites, while abnormal omnipolar conduction velocity (CV, <1mm/ms) was observed over 10(IQR 5.3-16.6) cm² and identified 20(61%) of critical sites, and fractionation mapping was observed over a median 4 (IQR 1.5, 7.6) cm² and encompassed 20 (61%) critical sites. A combination of ILAM + CV identified and Fractionation + CV both identified 28(85%) critical sites respectively, Figure 1. Mapping yield was greatest for Fractionation + CV (2.1 critical sites / cm²), and least for bipolar voltage mapping (0.5 critical sites / cm²). Sensitivity analysis evaluating impact of point density on CV mapping revealed 36% sensitivity for CV in maps with < 500 points, while CV sensitivity improved to 80% in maps with higher point density >1500. Figure 2.

Conclusion: ILAM, fractionation and conduction velocity mapping each identified distinct critical sites and provided a smaller area of interest than voltage mapping alone. Sensitivity of CV improved with greater point density.

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FIRST REAL-WORLD EXPERIENCE WITH PULMONARY VEIN ISOLATION USING PULSED FIELD ABLATION FOR PAROXYSMAL ATRIAL FIBRILLATION

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Background: Catheter ablation for AF using thermal energy can cause collateral damage. Pulsed field ablation (PFA) is a novel nonthermal energy source. Only a few small clinical studies have been published.