

## Voltage Mapping Point Collection and its Correlation with Early Acute Success of AVNRT Ablation

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**Background:** Atrioventricular Nodal Reentry Tachycardia (AVNRT) is a common reentrant arrhythmia in the adolescent and young adult population. Three-dimensional voltage mapping has been used to define the slow pathway thereby providing a target for catheter ablation. It is unknown whether collecting more voltage points to create a more robust map would result in fewer lesions required for acute successful ablation. We hypothesized that collection of more voltage points would correlate with fewer ablation lesions required for resolution of tachycardia.

**Methods:** A retrospective analysis was performed on all patients aged 21 years or younger with AVNRT who underwent cryoablation at our institution between January 2011 and October 2015. Each map was reviewed for total number of voltage points collected to create the voltage map and total number of lesions applied. A chart review was used to determine the number of lesions required for successful ablation. Acute success was defined as achievement of a predetermined endpoint by the electrophysiologist (ie elimination of tachycardia, A-H jump, or slow pathway conduction). Studies with no clear endpoint, multiple ablation modalities (ie cryoablation and radiofrequency ablation), evidence of congenital heart disease, and known recurrence were excluded from data analysis. Data were analyzed using T-test when comparing catheter type and Pearson's correlation for comparing total points collected versus total number of lesions required for success.

**Results:** Forty-three patients met inclusion criteria with inducible AVNRT and evidence of successful ablation (mean age  $14.8 \pm 2.4$  years). A 20 pole catheter was used in 16 studies and non-20 pole catheters (4, 8, or 10 pole) were used in 27 studies. There were significantly more voltage points collected with the 20-pole catheter ( $1253 \pm 516.8$  points) compared to non-20 pole catheter ( $612.4 \pm 287.1$  points,  $p=0.00$ ). Interestingly, there were more lesions placed when using a 20 pole catheter ( $8.3 \pm 2.6$  lesions) compared to non 20-pole catheter ( $6.5 \pm 2.9$  lesions,  $p=0.04$ ) but no significant difference between number of lesions required for acute success between the 20-pole ( $4.1 \pm 2.5$  lesions) vs non 20 pole catheter ( $4.4 \pm 2.9$  lesions,  $p=0.71$ ). There was not a significant correlation between total voltage points collected and number of lesions required for success across all studies ( $r=-0.04$ ,  $p=0.80$ ).

**Discussion:** This study did not demonstrate a correlation between total number of voltage points collected and number of lesions required for acute success. Using a 20 pole catheter resulted in more ablation lesions applied, but there was no significant difference of catheter type on number of lesions required for success. It is possible that collecting more voltage points resulted in a more defined map, and therefore more locations identified for ablation.