Propagation Mapping with Voltage Guided Slow-Pathway Ablation of Atrioventricular Nodal Reentry Tachycardia

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Abstract:

Background:

Voltage mapping has previously been demonstrated to allow a guided ablation of the slow pathway in atrioventricular nodal reentrant tachycardia (AVNRT). However there continues to be substantial subjectivity in the approach, and at times, voltage mapping does not adequately define the site of successful ablation. This retrospective study aimed to evaluate the use of propagation mapping used in conjunction with voltage mapping for guided ablation of AVNRT in pediatric and young adult patients.

Methods:

A retrospective study evaluated all patients 30 years of age or younger who underwent voltage mapping at two institutions with AVNRT. Patients were excluded if they had congenital heart disease or inadequate voltage point density within the triangle of Koch (TK). Patient and procedural demographic were collected. The voltage map was evaluated, and data points were checked for accuracy, excluding them if they were artifact or a non-consistent atrial driven rhythm. The Propagation map was constructed utilizing these voltage points and an atrial propagation "wave collapse" was marked on the map. The location of the wave collapse, the successful lesion, and the appearance of the voltage map were evaluated.

Results:

Thirty-Five patients with adequate point density for evaluation of propagation mapping were evaluated. There was success in 100% of patients with a recurrence rate of 2.8%. There were no long term complications. The median number of lesions to success was 1 (range 1-16). The age ranged from 4 to 20 years. The median fluoroscopy time was 0s, and median procedure time of 118min. There was a low voltage area present in all patients, and a wave collapse in all patients. The majority of the successful lesions were just above superior to the wave collapse within the triangle of Koch over a low voltage area.

Conclusion:

This was the first study to retrospectively evaluate propagation mapping as an aid in the identification of the slow pathway for AVNRT ablation. The successful ablation site was typically a few millimeters superior to the wave collapse over a low voltage area.