

PentaRay® Multi-Electrode Mapping Catheter for Atrial Tachyarrhythmia in Adults with Congenital Heart Disease

33

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Type of submitter

Fellow in Training

Abstract

Background:

Ablation of atrial tachyarrhythmia in adults with congenital heart disease (ACHD) is challenging due to complex anatomy and high burden of scar. The use of three-dimensional electroanatomic mapping systems (3D-EAM) is recommended and acute success rates using EAM are estimated to be greater than 80%. High density mapping with the PentaRay® (Biosense Webster) multi-electrode mapping catheter has been used safely for ablation of ventricular tachycardia in ischemic and non-ischemic cardiomyopathy patients. However, high density mapping has not been studied for ablation of atrial tachyarrhythmia in ACHD patients. We proposed the addition of high density mapping with PentaRay® mapping catheter to 3D EAM (EAM+P) allows for rapid acquisition of high resolution maps resulting in shorter procedure time.

Methods:

This is a single center retrospective cohort study of ACHD patients who underwent ablation procedures for atrial tachyarrhythmia from 2013 – 2017. Patients were divided into two cohorts: those who underwent ablation with EAM and those who underwent ablation with EAM with addition of PentaRay® high density mapping catheter (EAM+P).

Results:

Fifteen ablations were performed in 13 patients using standard EAM, and 11 ablations were performed in 10 patients using EAM+P. There was no difference in mean age (40 vs 34 years) or complexity of CHD (69% vs 60% complex CHD). EAM+P group included an average of 2 + 1 activation maps with an average

of 3956 + 2666 mapping points over an average of 54+ 28 min with MRI overlay (Figure 1). A higher number of sheaths were used for EAM cases compared to EAM+P ($p=0.008$). The procedure duration was 1.5 times longer in the EAM group compared to EAM+P ($p = 0.015$). The dose area product was 12 times higher in the EAM group compared to EAM+P ($p = 0.001$). Acute success rates of ablation were similar in the two groups with 92% success in EAM and 100% success in EAM+P. There recurrence at one year in the EAM cohort 38% vs. 10% in the EAM+P. There were no procedural related complications in either group.

Conclusions:

This is the first study to demonstrate the safety and efficacy of PentaRay® high density mapping catheter in addition to 3D mapping system for ablation of atrial tachyarrhythmia in ACHD patients. The use of PentaRay® high density mapping catheter results in shorter procedure time, decreased fluoroscopy dose and decreased number of access sites. There was no difference in acute success rate with the addition of PentaRay® mapping catheter in the ablation of atrial tachyarrhythmia.

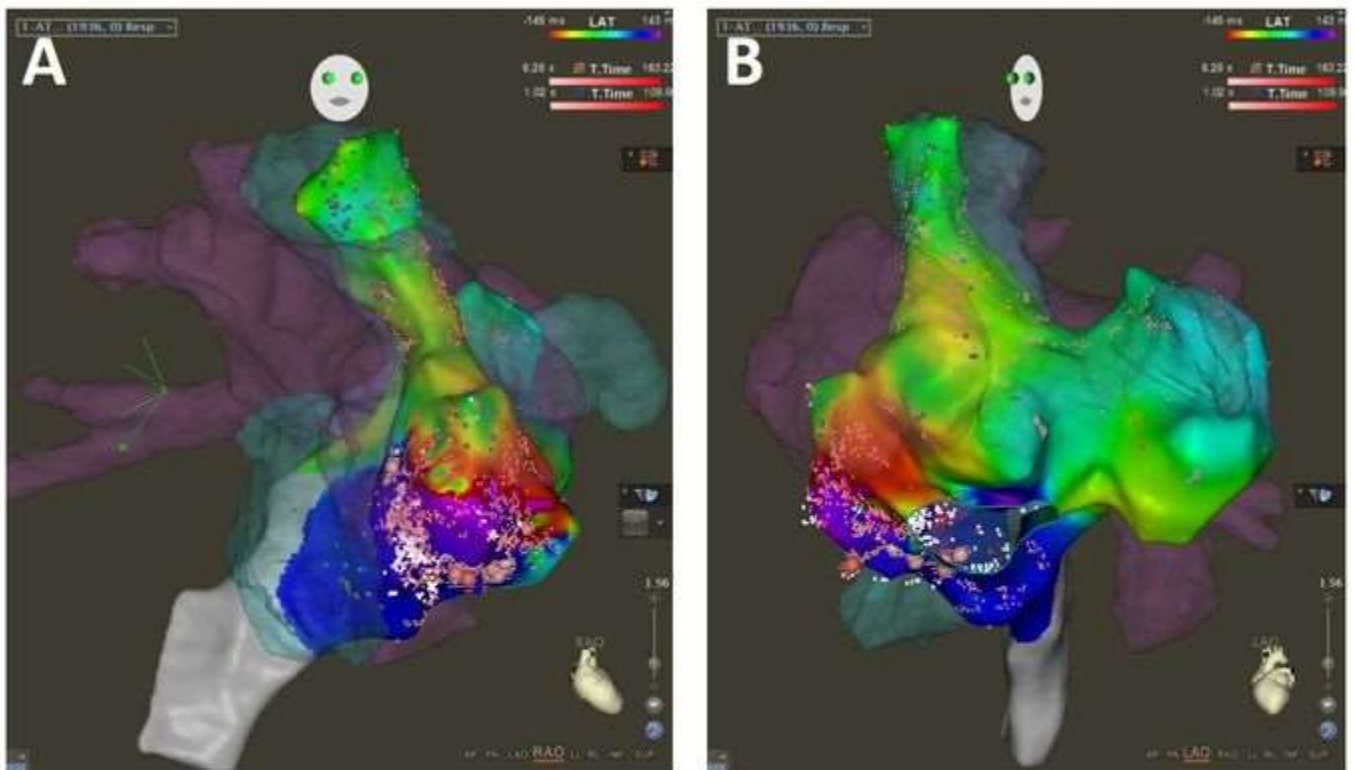


Figure 1. Activation map in a patient with D-Transposition of the Great Arteries s/p Mustard with CMR overlay, demonstrated early meets late activation, consistent with intra atrial reentrant tachycardia, 1942 activation points in 13:52 minutes (A) RAO View (B) LAO View

Categories

Advanced Fellow: Research

Program/Institution Name

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