

Pulmonary Vein Isolation Using RHYTHMIA™ Mapping System: Verification of Intracardiac Signals Using the Orion Mini-Basket Catheter

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Introduction

During pulmonary vein isolation (PVI), a circular lasso catheter is positioned at the junction between the left atrium (LA) and the pulmonary vein (PV) to confirm PVI. In this study, researchers compared signals between the RHYTHMIA™ Mapping System's mini-basket catheter (from Boston Scientific) and the lasso catheter at the LA-PV junction.

Methods

The RHYTHMIA Mapping System uses an 8F deflectable catheter with a mini-basket (1.8 cm diameter) of 8 splines of 8 electrodes (total 64 electrodes, 2.5mm spacing). The system automatically generates chamber geometry and a HR activation map using electrograms (EGMs) recorded within 5 mm of the chamber surface. It automatically acquires EGM and location information based on EGM stability and respiration phase.

Results

At baseline, recordings of LA and PV potentials were concordant in all PVs. However, after PVI, concordance between the catheters was poor – at only 68 %. Discordance in all cases resulted from loss of PV potentials on the lasso catheter that were captured with the mini-basket catheter. In 9 of 13 PVs (69 %), these potentials represented true PV potentials that were exclusively recorded with the Rhythmia system. In the other 4 PVs (31 %), the potentials originated from neighboring structures and resulted in underestimation of PVI.

Conclusion

The use of the RHYTHMIA mini-basket catheter alone was sufficient to determine PVI. The RHYTHMIA catheter improved recording of PV potentials after incomplete ablation. It was also associated with frequent recording of "PV-like" potentials lost by the lasso catheter – most of which were related to incomplete PVI but some of which represented far-field signals originating from neighboring structures. In these cases, pacing maneuvers are helpful to determine PVI and avoid excessive ablation.

This is a single-center study with a limited number of patients. Nonetheless, the objective was to characterize the electrogram differences between the lasso and the mini basket catheter. A total of 48 PVs were assessed with consistent findings among all subjects. In addition, operators experienced with Rhythmia and the mini-basket catheter performed the ablation procedures.

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