Pulmonary vein isolation after circumferential pulmonary vein ablation: Comparison between Lasso and three-dimensional electroanatomical assessment of complete electrical disconnection

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BACKGROUND: Pulmonary vein isolation (PVI) is one of the common endpoints of all atrial fibrillation (AF) ablation procedures and is most often validated using a preshaped circular catheter. However, three-dimensional (3D) electroanatomical systems used for anatomy reconstruction and to guide coalescent delivery of ablation lesions avoid the use of multiple transeptal punctures and multiple catheters in the left atrium. **OBJECTIVE:** To assess correspondence in PVI validation between a 3D electroanatomical system and a Lasso catheter. **METHODS:** Twenty-five patients affected by nonpermanent AF were enrolled after giving informed consent. After ablation of all four pulmonary vein (PV) ostia, encircled areas were extensively mapped (15 +/- 5 points acquired for each PV ostium) to assess the absence of any electrical activity conducted from the left atrium to the PV. At the end of the procedure, the physician performing the ablation procedure judged the complete versus incomplete PVI according to Carto/ablation catheter mapping during coronary sinus pacing. Thereafter, a second operator blinded to the result of the ablation procedure positioned a preshaped Lasso catheter in each PV ostium and annotated complete/incomplete PVI during pacing from the coronary sinus. **RESULTS:** PVI as assessed with CARTO was 100% concordant with Lasso evaluation of PVI. Fluoroscopic times were 2.5 +/- 0.9 minutes to complete circumferential PV ablation and 5.5 +/- 1.9 minutes to properly position the Lasso catheter. No acute complications were reported in this series of patients. **CONCLUSIONS:** PVI assessment using a 3D electroanatomical system is as accurate as Lasso evaluation, with excellent concordance.

Heart Rhythm. 2009;6(12):1706-1713.

Key Take-Aways

- The primary focus of this study was to assess if a difference was evident in measuring electrical dissociation of the PVs with a CARTO®-enabled magnetic ablation catheter (NaviStar® RMT ThermoCool®) or with a Lasso™ catheter.
- The use of a Lasso™ catheter to evaluate electrical breakthrough after PVI requires an additional transseptal puncture and additional fluoroscopy to place the Lasso catheter at each PV which can also increase safety risks.
- CPVA was performed remotely using a NaviStar® RMT ThermoCool® catheter along with CARTO® RMT. Power, temperature and irrigation flow settings were 30W, 39°C and 25 ml/min, respectively.
- Two (2) operators were used to perform the different measurements during each case. The physician using the Lasso™ was blinded to the PVI results measured with CARTO® RMT.
- After initial PVI was performed, each PV was mapped with CARTO® RMT to check for complete PV isolation. Each PV was then tagged as "complete" or "incomplete." The blinded physician was then asked to assess each PV using a Lasso™ catheter.
- The assessment of PV electrical dissociation was 100% concordant between the CARTO® RMT assessment and the Lasso™ catheter assessment.
- The investigators report that each patient was followed for 12 months with 90% (18 of 20) of paroxysmal AFs and 80% (4 of 5) of persistent AFs in sinus rhythm at the end of the follow-up period without the need for antiarrhythmic drug therapy.
- Remapping each PV to assess for electrical disconnection decreases fluoroscopy time while improving safety, since a second transseptal puncture is not required when assessing PVI with CARTO® RMT. Remapping the PVs individually after ablation can be challenging and increases procedure times.
- The authors conclude that PVI assessment with the localized magnetic catheter is as accurate as PVI assessment with the Lasso™ catheter.

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