

Remote Magnetic Versus Manual Catheter Navigation for Ablation of Supraventricular Tachycardias: A Randomized, Multicenter Trial

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Introduction: The potential benefits of remote robotic navigation for catheter ablation procedures have not been demonstrated in controlled clinical trials. The purpose of this study was to compare remote magnetic catheter navigation to manual navigation for the ablation of common supraventricular arrhythmias.

Methods and Results: Patients with supraventricular arrhythmias due to atrioventricular (AV) nodal reentry, accessory pathways, or undergoing AV junctional ablation for complete heart block were randomized in a 3:1 ratio between magnetic (Niobe system and Helios II catheter, Stereotaxis, Inc., St. Louis, MO) and manual navigation for radiofrequency ablation at 13 centers. The primary endpoint of the study was total fluoroscopic time. Fifty-six patients were randomized to magnetic navigation and 15 to manual navigation. AV nodal reentry was the most common arrhythmia in both groups. Total fluoroscopy time was reduced in the magnetic navigation group (median 17.8 minutes, interquartile (IQ) range 9.9, 27.8 minutes) compared to manual navigation (27.1, IQ 19.0, 48.0, $P < 0.05$). The acute success rates (91% for magnetic and 87% for manual navigation, $P > 0.05$) did not differ between groups. The number of lesions delivered was less for magnetic navigation (6, IQ 4, 9 vs 10, IQ 7, 26, $P < 0.05$). Total procedure time (median 151, IQ 111, 221 minutes magnetic and 151, IQ 110, 221 minutes manual) and complication rates (5.4% patients magnetic and 6.7% patients manual) were similar between the groups (both $P > 0.05$).

Conclusions: Remote magnetic catheter navigation reduces fluoroscopic time and radiofrequency lesion deliveries for the ablation of common supraventricular arrhythmias compared to manual catheter navigation. (PACE 2008; 31:1313–1321)

ablation, SVT, new technology

Summary:

- This publication details results obtained from a prospective, multicenter, randomized study comparing a magnetic ablation catheter to a conventional ablation catheter.
- The primary outcome, fluoroscopy time, was significantly reduced for the magnetic navigation group (median 17.8 minutes) when compared to the conventional group (median 27.1 minutes).
- The number of RF ablations required to achieve equivalent effectiveness was lower in the magnetic navigation group than in the conventional group. The investigators noted that this reduction supported the hypothesis of improved catheter stability and precision with magnetic navigation.
- Even in learning curve cases with the magnetic catheter, investigators were able to obtain success rates, adverse event rates, and overall procedure times that were equivalent to the conventional catheter.
- The investigators attributed the reduction in fluoroscopy time to image integration, the reduced need for visualization due to catheter flexibility, and the increase in catheter stability when compared to conventional catheters.