Remote magnetic navigation with irrigated tip catheter for ablation of paroxysmal atrial fibrillation

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BACKGROUND: -Remote magnetic navigation system (MNS) has been used with a non-irrigated magnetic catheter for atrial fibrillation (AF) ablation. To evaluate the feasibility and efficiency of the newly available irrigated-tip magnetic catheter for index isolation of pulmonary veins (PVI) in patients with paroxysmal AF (PAF).
METHODS AND RESULTS: -Between January 2008 and June 2009, 30 consecutive patients with drug-resistant PAF underwent circular mapping catheter guided PVI using MNS(MNS-group). The outcomes were compared retrospectively with that of conventional hand-controlled ablation technique during the same period in 44 consecutive patients(manual-group). All 4 PVs were successfully isolated in both groups except in 4 patients in the MNS-group. RF and procedure duration were higher in the MNS-group than manual-group (60 ± 27 vs 43 ± 16 min, p=0.0019, and 246 ± 50 vs 153 ± 51 min, p<0.0001). In the patients who underwent only PVI, total fluoroscopic time was also longer in the MNS-group than manual-group (58 ± 24 vs 40 ± 14 min, p=0.0002). At 12-month follow-up after a single procedure, 69.0% of patients in MNS-group and 61.8% of patients in manual-group were free of atrial tachyarrhythmia without antiarrhythmic drug. There was no significant difference in the atrial tachyarrhythmia-free survival between the 2 groups(p=0.961). Cardiac tamponade occurred in 1 patient in the manual-group.
CONCLUSIONS: -In patients with PAF, MNS guided PVI with newly available irrigated-tip magnetic catheter backed up with manual ablation whenever required, is feasible. However it requires longer ablation, fluoroscopy and procedural times than the conventional approach in the early experience-stage.

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Key Take-Aways

- Evaluation of a center's early experience with the magnetic navigation system in conjunction with irrigated-tip catheters (NaviStar® RMT ThermoCool®, Biosense Webster) for paroxysmal atrial fibrillation (PAF) ablation by pulmonary vein isolation (PVI) and comparison to manual technique.
- The MNS and manual groups consisted of 30 and 44 consecutive patients, respectively. Groups were not significantly different according to patients' baseline clinical characteristics. All patients were treated using the same ablation strategy and similar energy delivery conditions.
- Compared to the manual group, the MNS group was associated with longer fluoroscopy (45 ± 16 vs. 63 ± 18 min, p = 0.0002), procedural (165 63 ± 52 vs. 263 ± 72 min, p < 0.0001), and RF (47 ± 17 vs. 67 ± 33 min, p = 0.0016) times.
    - The authors attribute longer MNS times in part to the requirement that the operator move frequently between the operating room and the remote control room in order to adjust the circular mapping catheter.
- PVI was achieved in 100% and 95% of veins (44 vs. 26 patients) in the manual and MNS groups, respectively. At 12-month follow up, 69.0% of MNS patients and 61.8% of manual patients were free of atrial tachyarrhythmia without antiarrhythmic drug therapy.
- One manual patient (2.3%) experienced cardiac tamponade with audible pop, requiring percutaneous drainage. No MNS patient experienced any major complication.
- The authors speculate that outcome and procedure data may be skewed by a "lack of extensive experience with the MNS". Although not mentioned in the text, the procedures were carried out by 8 separate operators, many of whom had no previous experience with the MNS. Consequently, the data suggest that with the exception of time, MNS based ablation can achieve comparable outcomes to the most prestigious AF centers even within the initial learning curve period.

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