The Impact of Left Atrial Size in Catheter Ablation of Atrial Fibrillation Using Remote Magnetic Navigation

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Introduction: The objective of this study was to investigate the impact of left atrial (LA) size for the ablation of atrial fibrillation (AF) using remote magnetic navigation (RMN).

Methods: A total of 165 patients with AF who underwent catheter ablation using RMN were included. The patients were divided into two groups based on LA diameter. Eighty-three patients had small LA (diameter < 40 mm; Group A), and 82 patients had a large LA (diameter ≥ 40 mm; Group B).

Result: During mapping and ablation, X-ray time (37.0 (99.0) s vs. 12 (30.1) s, \( P < 0.001 \)) and X-ray dose (1.4 (2.7) gy·cm² vs. 0.7 (2.1) gy·cm², \( P = 0.013 \)) were significantly higher in Group A. No serious complications occurred in any of the patients. There was no statistical difference in the rate of first anatomical attempt of pulmonary vein isolation between the two groups (71.1% vs. 57.3%, \( P = 0.065 \)). However, compared with Group B, the rate of sinus rhythm was higher (77.1% vs. 58.5%, \( P < 0.001 \)) during the follow-up period. More patients in Group A required a sheath adjustment (47/83 vs. 21/82, \( P < 0.001 \)), presumably due to less magnets positioned outside of the sheath. In vitro experiments with the RMN catheter demonstrated that only one magnet exposed created the sheath affects which influenced the flexibility of the catheter.

Conclusion: AF ablation using RMN is safe and effective in both small and large LA patients. Patients with small LA may pose a greater difficulty when using RMN which may be attributed to the fewer magnets beyond the sheath. As a result, the exposure of radiation was increased. This study found that having at least two magnets of the catheter positioned outside of the sheath can ensure an appropriate flexibility of the catheter.