

The importance of magnetic field strength in atrial fibrillation ablation with Stereotaxis

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INTRODUCTION: Recent data suggest that remote magnetic navigation (Stereotaxis, Inc.) is a helpful tool in percutaneous ablation (Abl) of atrial fibrillation (AF). The application of a higher Density magnetic field (CM) had the advantage of increasing the catheter stability and the contact with the surface of the atrium. The aim of this study is to compare the results of our initial experience with magnetic strength of 0.1 Tesla (T) vs. 0.08 T used in the earliest procedure.

METHODS: We studied 84 consecutive patients (p:s), average age: 58 +/- 13 years, 24% female undergoing wide area circumferential pulmonary vein isolation guided by Lasso catheter. Additional lesions were created in some patients particularly those with persistent atrial fibrillation. We used an irrigated catheter of 3.5 mm (Thermocool Navistar RMT) guided by magnetic navigation in all cases. We recorded and compared the demographics characteristics, AF type, left atrium volume determined by CT, the success rate (isolation of all veins (IAV)), complication rate, total time of procedure, of fluoroscopy, of radiofrequency application; of construction of electroanatomic map (CARTO) and of the full use of CARTO.

RESULTS: Groups (0.08 T vs 0.1 T) were similar with respect to demographics and AF type (persistent in 21% vs 25%). The volume of the left atrium was similar (86 +/- 27 ml vs 76 +/- 25 ml., p = NS). The IAV was achieved in all patients. There were no complications in any of the groups. There was a reduction in the total time of the procedure that did not reach statistical significance (231 +/- 49 minutes vs 213 +/- 40 minutes, P = 0.10). There was no difference in the time of construction of the CARTO map (18 (13,24) vs 21 (17,25), P = 0.17). There was a statistically significant reduction in fluoroscopy time (18 +/- 6 minutes vs 10 +/- 6 minutes, P < 0.001), and in time of radiofrequency application (59 +/- 19 minutes vs 52 +/- 15 minutes, P = 0.04).

CONCLUSIONS: The use of a more intense magnetic field (0.1 T) in AF Abl guided by magnetic control (Stereotaxis, Inc) reduce the time of radiofrequency application suggesting a better contact with the atrium surface, and reduced the time of fluoroscopy suggesting a greater stability of the catheter.

Europace 2010;12(Suppl 1):1-196.

Key Take-Aways

- Compares the outcomes of the Stereotaxis magnetic navigation system (MNS) for atrial fibrillation (AF) ablation by pulmonary vein isolation with a Navistar® RMT ThermoCool® irrigated radiofrequency catheter at magnetic field strengths of either 0.08 T or 0.1 T (n=84).
- All mapping and ablation procedures were acutely successful with the MNS and no complications occurred in either group.
- Fluoroscopy time was significantly lower in the 0.1 T group (10±6 min vs. 18±6 min, p < 0.001).
- RF application time was significantly lower in the 0.1 T group (52±15 min vs. 59±19 min, p = 0.04).
- Total procedure time was lower in the 0.1 T group, although this trend did not reach statistical significance (213±40 min vs. 231±49 min, p = 0.10).
- CARTO® map construction time was not significantly different between the groups (21 [range 17-25] vs. 18 [range 14-24], p = 0.17).
- Magnetic navigation was associated with excellent outcomes (100% acute success with no complications) when using either magnetic field-strength setting.
- The authors concluded that the increase in field strength may enhance the stability of the magnetic catheter.