

Comparison between 3D Rotational Angiography and Traditional Fluoroscopic Guidance for Arrhythmia Mapping and Ablation

Abstract:

Background: Three dimensional rotational angiography (3DRA) is a promising new tool for 3D imaging strategy or combined with 3D electroanatomical mapping systems might add more understanding to cardiac anatomy in relation to the mapping and ablation procedures.

Objective: The purpose of this prospective cohort study was to compare the procedural and clinical outcome of patients with all types of arrhythmia treated by catheter ablation using conventional fluoroscopy, three-dimensional (3D) electroanatomical mapping and/or 3DRA.

Methods: From January 2013 to August 2013. Fifty consecutive patients with different types of arrhythmia (mean age 31.8 ± 8.7 years old; 7 patients paroxysmal AF, 6 patients with VT, 14 patients with WPW, 21 patients with SVT, 2 patients with WCT) were randomized to ablation using either 3DRA (18 patients), 3D electroanatomical mapping combined with 3DRA (13 patients) or standard fluoroscopy (19 patients).

Results: There was no difference in total radiofrequency applications (56.3 ± 132.8 vs 54.8 ± 117.1 minutes, respectively, $P: 0.968$), procedural duration (130 ± 70 vs 115 ± 73 minutes; $P: 0.335$), fluoroscopic duration (85.2 ± 61.7 vs 71.2 ± 37.7 minutes; $P: 0.341$), or radiations exposure (71.810 ± 42.954 vs 69.009 ± 38.345 mGy cm²; $P: 0.719$) between procedures performed with conventional or 3DRA. More significant reduction in mapping time (22.3 ± 13 vs 16.2 ± 8.4 , $P: 0.056$) between conventional vs 3DRA. After a mean follow up of 6 ± 2.8 months, there was difference in clinical outcome using either conventional or 3DRA concerning total arrhythmia recurrence (19% vs 0%, $P: 0.039$).

Conclusion: Three dimensional rotation angiography guided arrhythmia ablation has similar radiation exposure and procedural characteristics, but with much less mapping time and recurrence rate in comparison to standard fluoroscopic guidance ablation. The ease of use and accurate 3D representation of cardiac chambers make 3DRA a reasonable alternative to conventional 3D electroanatomical mapping systems, however without advanced mapping functions.

Keywords: *3D Rotational Angiography, Fluoroscopic Guidance, electroanatomical*