

Pulmonary vein isolation without fluoroscopy: results evaluation

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Introduction: From the outset, the use of Xray (XR) has been a critical component in both the guidance and development of arrhythmia ablation procedures. At present however, due to the complex nature of electrophysiology procedures, the use of XR in isolation is not sufficient to ensure procedural success. Subsequently, the use of non-fluoroscopic virtual mapping systems is essential. Currently, given the evolution of this technology and its essential nature for procedural guidance, it is worth asking whether the use of XR is indeed still necessary in the modern era. The objective of this study was to demonstrate that “zero-XR” ablation of complex arrhythmias such as atrial fibrillation is both possible and safe.

Methods: Between 2020 and 2021, a total of 116 patients admitted for pulmonary vein ablation were included in the study. Amongst these, 41 patients were prospectively included at our centre, in a protocol for point-by-point ablation of pulmonary veins without fluoroscopy, “zero-XR”. In addition to the non-fluoroscopic mapping system, the transseptal puncture was monitored by intracardiac ultrasound in all cases. The objective of the

ablation was the complete isolation of the pulmonary veins. In some patients, at the discretion of the operator, the ablation of other substrates was added. For the remaining 75 patients in the study, the ablation was performed using conventional techniques without the limitation of the use of XR. The mean follow up was 12 months.

Results: The baseline characteristics of the patients, as well as the description of the procedure, are shown in the Table. There were no differences in the acute success rate or procedure time between the two groups. There was only one complication related to the procedure in the non-XR group consisting of pericardial effusion without cardiac tamponade. Regarding the recurrence rate at 12 months, it was higher in the group with fluoroscopy, without reaching statistical significance [n=0 in the group without fluoroscopy, n=2 (2.7%) in the group with fluoroscopy, p=0.15].

Conclusion: In our series, point-by-point ablation of atrial fibrillation without fluoroscopy proved to be a safe and feasible technique, with similar success rates when compared to conventional procedures using XR.

Variables	Without XR (n=41)	With XR (n=75)	p
POPULATION FEATURES			
Age, mean (sd)	61.1 ± 10.1	59.9 ± 8.9	0.53
Male sex, n(%)	29 (70.3%)	50 (66.7%)	0.65
Structural heart disease, n(%)	2 (4.9%) -Restrictive: 1 (50%) -Tachyopathy: 1 (50%)	8 (10.7%) -Tachyopathy: 1 (12.5%) -Ischemic: 4 (50%) -Rheumatic: 1 (12.5%) -Idiopathic: 1 (12.5%) -Congenita: 1 (12.5%)	0.29
CHA ₂ DS ₂ -VASc	0p: 21 (51.2%) 1p: 13 (31.7%) 2p: 6 (14.6%) ≥3p: 1 (2.4%)	0p: 43 (57.3%) 1p: 20 (26.7%) 2p: 11 (14.7%) ≥3p: 1 (1.3%)	0.89
Atrial fibrillation type, n(%)	Paroxistic 30 (73.2%) Persistent 11 (26.8%)	Paroxistic 53 (70.7%) Persistent 22 (29.3%)	0.77
PROCEDURAL DESCRIPTION			
XR duration (min), mean (sd)	0	17 ± 8.9	< 0.001
Ablation success (complete pulmonary vein isolation), n(%)	41 (100%)	75 (100%)	1
CTI ablation, n(%)	3 (7.3%)	6 (8%)	0.89
Other substrates ablated (apart from pulmonary veins and CTI), n(%)	0	1 (1.3%)	0.46
Procedure duration (min), mean (sd)	200 ± 9.6	190 ± 11	0.46
Complications, n(%)	1 (2.4%) (pericardial effusion)	0	0.17
Recurrence during first 12 months, n(%)	0	2 (2.7%)	0.29

Table. Baseline clinical and procedural characteristics and results in patients with pulmonary vein ablation according to the use of XR. CTI: cavotricuspid isthmus. N: number. Min: minutes. P calculated with Chi-squared for categorical variables and t-test for continuous variables. Sd: standard deviation.