The addition of strict stability criteria does not reduce recurrences after atrial fibrillation ablation using ablation index and can impact on procedure efficiency

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Background: Ablation Index (AI) is a proprietary lesion quality marker that combines power, contact force and time. Recent studies showed that radiofrequency (RF) pulmonary vein isolation (PVI) using AI can deliver high arrhythmia-free survival rates at mid-term follow-up in patients with paroxysmal atrial fibrillation.

Purpose: The aim of this multicenter study was to compare the outcome of three different strategies of PVI using AI (group 1 and 2) or VISITAG module with average force and strict criteria of stability as target parameters (group 3).

Methods: We enrolled 132 consecutive naive patients (97 males, mean age 61,03±9,42) affected by paroxysmal atrial fibrillation who underwent PVI at two high volume centres between January 2017 and February 2019. AI target was set at ≥380 at the posterior wall and ≥500 at the anterior wall. A strict stability criteria (VISITALY criteria: 3 mm for a time of 15 s and a FOT >5 g for 60% of the time) was set for Group 1 procedures (65 patients), whereas Group 2 procedures (67 patients) were carried out with standard stability criteria (VISTAX criteria: 3 mm for a time of 3 s and FOT >3 g for 25% of the time). We then compared those strategies with a historical cohort of 72 patients (40 males, mean age 60,74±8,53) treated at our centres with RF PVI using the VISITAG module with average force and strict stability criteria as target parameters. An interlesion distance ≤6 mm was a target parameter for all procedures. Recurrence was defined as any AF, atrial tachycardia (AT) or atrial flutter (AFL) during the 12 months after ablation, excluding a blanking period of 90 days.

Results: There were no significant differences in terms of age (Group 1 59,2±8,97; Group 2 62,81±9,58; Group 3 60,74±8,53 years) and left atrial area (Group 1 24,16±20,46; Group 2 22,55±12,32; Group 3 20,74±3,84 cm^2). Group 1 showed a slightly higher number of males (Group 1 78,46%; Group 2 68,66%; Group 3 55,56%; p=0,004). Procedure duration was significantly lower in Group 2 compared to Groups 1 and 3 (176,67±50,88 vs 224,05±47,21 min, p<0,001; 176,67±50,88 vs 203,96±52,38 min p=0,02). Fluoroscopy time was significantly higher in Group 1 compared with Group 2 (11,85±4,38 vs 10,39±6,4 min; p=0,014). There was a slight trend to have a higher freedom from AF/AT/AFL at 12 months in group 2 compared to the others (Group 1 86,15% vs Group 2 91,04% vs Group 3 84,72%; p=0,2).

Conclusion: A strategy of PVI using AI with standard stability criteria performed the best in terms of procedure efficiency, with a significant benefit in terms of procedure duration, delivering a 12 months arrhythmia-free survival rate comparable with other strategies. Combination of AI with strict stability criteria provided no benefit, at a cost of a higher fluoroscopy time and longer procedure duration.