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Impact of standardized, paired ostial-antral ablation protocol using the circular over-the-wire pulsed field ablation system on long-term outcomes of atrial fibrillation ablation

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Introduction: Pulsed field ablation (PFA) with the circular over-the-wire PulseSelect™ catheter achieves near-universal acute pulmonary vein isolation (PVI), but redo studies report frequent reconnection, predominantly at the intervenous carinae.[1,2] We hypothesized that a standardized protocol with paired ostial-antral lesions and additional applications targeting the carinae and anterior aspects of the veins improves long-term outcomes.

Patients and methods: We analyzed 136 consecutive patients undergoing first-time PVI with PulseSelect. The standard protocol (STD, n=44) consisted of 8 applications per vein (4 antral, 4 ostial), as officially recommended by the manufacturer. In the modified protocol (MOD, n=92), paired ostial and antral applications were delivered at each catheter position, with 3 additional antral applications directed at the carina and anterior aspect of every vein (11 per vein). Patients were followed up at 6 and 12 months with 12-lead ECG, physical examination and 24-h Holter ECG. The primary endpoint was freedom from atrial tachyarrhythmia recurrence during follow-up of up to 12 months, analyzed overall and by AF type. Logistic regression was adjusted for age, CHA-DS-VA and AF type.

Results: Mean age was 65.5±9.5 years and 60% had persistent AF (PsAF), with no difference in AF type between groups. MOD patients had higher CHA-DS-VA (2.5±1.4 vs 1.9±1.0, p=0.009). Procedure duration did not differ (54.2±4.2 vs 52.9±5.1 min, p=0.17). At 12 months, recurrence occurred in 18.5% of MOD vs 56.8% of STD patients (p<0.001; adjusted OR 0.11, 95% CI 0.04–0.29). Freedom from recurrence was higher with MOD in both paroxysmal AF (97.4% vs 41.2%, p<0.001) and PsAF (70.4% vs 44.4%, p=0.03).

Conclusion: A standardized, paired ostial-antral approach with 3 additional antral applications per vein was associated with a significant reduction in AF recurrence without prolonging the procedure, in patients with both paroxysmal and persistent AF.

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LITERATURE

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