Electrical posterior box isolation in persistent atrial fibrillation changed to paroxysmal atrial fibrillation: a multi-center, prospective, randomized study

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Background: Persistent atrial fibrillation (PeAF) can change to paroxysmal AF (PAF) after antiarrhythmic drug medication and cardioversion.

Purpose: We investigated whether electrical posterior box isolation (POBI) may improve rhythm outcome of catheter ablation in those patient group.

Methods: We prospectively randomized 114 patients with PeAF to PAF (male 75%, 59.8±9.9 years old) to circumferential pulmonary vein isolation (CPVI) alone group (n=57) and additional POBI group (n=57). The primary end-point was AF recurrence after a single procedure, and the secondary end-point was a recurrence pattern, cardioversion rate, and the response to antiarrhythmic drugs (AADs).

Results: After a mean follow-up of 22.5±9.4 months, the clinical recurrence rate did not significantly differ between the two groups (29.8% vs. 28.1%, p=0.836; log rank p=0.815) The recurrence rate for atrial tachycardias (17.6% vs. 43.8%, p=0.141) was higher in POBI group, but the cardioversion rates (13.5% vs. 8.5%, p=0.434) were not significantly different between two groups. At the final follow-up, sinus rhythm was maintained without antiarrhythmic drug in 52.6% in CPVI group and 59.7% of POBI group (p=0.452). No significant difference was found in the major complication rates between the two groups (5.3% vs. 1.8%, p=0.618), but the total ablation time was significantly longer in the POBI group (4397±842 sec vs. 5337±1517 sec, $p<0.001$).

Conclusion: In patients with persistent AF converted to paroxysmal AF by AAD, the addition of POBI to CPVI did not improve the rhythm outcome of catheter ablation nor influence overall safety.