Is pulmonary vein isolation enough for persistent atrial fibrillation? Multi-center randomized trial

Introduction: Although STAR AF2 proved no additional benefit of additional extra-pulmonary vein (PV) left atrial (LA) ablation in patients with persistent atrial fibrillation (AF), long-term recurrence rate was still high. We hypothesized that posterior wall isolation may improve rhythm outcome of catheter ablation of persistent AF.

Methods: We randomly assigned 213 patients with persistent AF (male 83.1%, 58.6 ± 10.7 years old) in a 1:1 ratio to ablation with circumferential PV isolation (CPVI group, n=106) and CPVI with additional linear ablation group (posterior wall isolation and anterior line, LINE group, n=107). We achieved electrical isolation of LA posterior wall by roof line, posterior inferior line, and/or focal ablation of remnant atrial potentials. The primary end point was AF recurrence after single procedure, and the secondary end point was recurrence pattern and response to antiarrhythmic drugs (AAD).

Result: Randomization of two groups was well matched, and LA posterior wall isolation and bidirectional block of anterior line were achieved in 94% and 70%, respectively. Ablation time was significantly longer in additional linear ablation group (CPVI group 4211 ± 1920 seconds vs. LINE group 5340 ± 2373 seconds, p<0.001). Major complication rate was not significantly different between CPVI group and additional linear ablation group (4.7% vs. 0.9%, p=0.119). During 16.1±8.9 months follow-up, clinical recurrence rate was not significantly different between two groups (21.7% vs. 23.4%, p=0.771; log rank p=0.585), but about half of patients were taking AAD (48.1% vs. 42.1%, p=0.382) at the time of first clinical recurrence of AF. Recurrence as atrial tachycardia (AT) was 8.7% in CPVI group and 20% in additional linear ablation group (p=0.506), and electrical cardioversion was required in 15.1% and 20.6%, respectively (p=0.297). Finally, maintenance of sinus rhythm without AAD was achieved in 44.5% and 52.5% without significant difference across the treatment groups (p=0.243).

Conclusion: In patients with persistent AF, routine addition of linear ablation lesion including posterior wall isolation did not improve rhythm outcome after catheter ablation. Additional linear ablation did not influence the type of recurrent atrial arrhythmia and response to AAD, also.