**Introduction**: In some patients with persistent atrial fibrillation (AF), AF type is changed to paroxysmal AF after antiarrhythmic drug medication and cardioversion. We investigated whether posterior wall isolation (PWI) may improve rhythm outcome of catheter ablation in patients with persistent AF to paroxysmal AF.

**Methods**: A total of 104 patients with persistent AF to paroxysmal AF (male 75%, 59.8 ± 9.9 years old) were enrolled at 3 tertiary hospitals and the participants were randomly assigned to ablation with circumferential pulmonary vein isolation (CPVI group, n=47) or CPVI plus posterior wall isolation (PWI group, n=57). The primary end-point was AF recurrence after a single procedure, and the secondary endpoint was a recurrence pattern and the response to antiarrhythmic drugs (AADs).

**Result**: Randomization of two groups was well matched, and PWI was achieved in 94.7% of patients. Ablation time was significantly longer in PWI group (5337 ± 1517 second vs. 4397 ± 842 seconds, p<0.001). Major complication rate was not significantly different between CPVI group and PWI group (6.4% vs. 1.8%, p=0.326). During 22.5±9.4 months follow-up, clinical recurrence rate was not significantly different between two groups (36.2% vs. 24.6%, p=0.198; log rank p=0.325). Recurrence as atrial tachycardia was 11.8% in CPVI group and 50% in PWI group (p=0.440), and electrical cardioversion was required in 4.3% and 10.5%, respectively (p=0.289). At the final follow-up, sinus rhythm was maintained in 89.4% (36.2% under AADs) and 93.0% (33.3% under AADs) in the CPVI and PWI groups, respectively (p=0.762).

**Conclusion**: In patients with persistent AF converted to paroxysmal AF, addition of PWI to CPVI did not improve rhythm outcome of catheter ablation or influence the type of recurrent atrial arrhythmia.