Introduction: Any additional left atrial (LA) substrate modification in addition to pulmonary vein isolation (PVI) for persistent atrial fibrillation (PeAF) is not superior to a PVI only strategy. Therefore, it remains a class 2b recommendation in the international consensus statement. In contrast, a durability of PVI is improving along with the technological innovations. We aimed to investigate the efficacy of a 2 step ablation strategy for PeAF; The 1st ablation session involved a PVI alone and the 2nd ablation session an LA substrate modification in addition to a redo PVI.

Methods: We prospectively evaluated 226 consecutive PeAF patients that underwent a first time ablation. We excluded patients with an AF duration of over 3 years. We performed all PVIs with contact force and stability guidance (CARTO3, VisiTag Module). We performed a 2nd session for AF in case of a recurrence as needed. LA substrate modification, including a posterior wall isolation (PWI), low voltage zone (LVZ) ablation, trigger ablation, and/or mitral isthmus (MI) ablation, were performed in addition to the redo PVI as needed during the 2nd session.

Result: The age was 67±10 years old, BMI 24±4kg/m2, AF duration 9.4±11.8 months, and LA dimension was 36.8±6.5mm. The mean follow-up period was 16 months. The success rate of the 1st session was 76.5%. An atrial tachycardia (AT) form of recurrence was observed in only 10 patients (4.4%). Two-thirds of the patients with AT/AF recurrences (64%) needed a 2nd session. PV reconnections were not observed in 71% of patients receiving a 2nd session. A PVI redo (29%), PWI (71%), LVA ablation (9%), trigger ablation (9%), and MI ablation (6%) were performed in the 2nd session. As a result, the success rate of the 2 step ablation for PeAF was 87%. Furthermore, the majority of the patients (98%) maintained sinus rhythm without a permanent form of AT/AF recurrence. No serious adverse events occurred during the procedure or follow-up period.

Conclusion: In the patients with early stage PeAF, the 2 step ablation was safe and achieved a high success rate. The incidence of an AT form of recurrence after the 1st session was extremely low. The main procedures performed in the 2nd session were the PVI redo and PWI.