Introduction: Fixed atrial fibrillation (AF) ablation is inadequate by pulmonary vein isolation (PVI) alone. The efficacious strategy is likely to combine isolation of the pulmonary veins with limited linear ablation within the left atrium. We evaluated the efficacy of the left atrial roof line joining the superior PVs (LARL) in fixed AF patients.

Methods: We selected 79 patients (age: 65 +/- 11 years; duration of fixed AF: 2 +/- 2 years) who took fixed AF ablation. We performed PVI, LARL and cavotricuspid isthmus line (CTIL) ablation for all patients. Intercardiac defibrillation was performed before PVI. If not terminated AF, performed after PVI, LARL, and CTIL ablation also.

Result: AF was terminated in 67 patients (85%) before and after PVI, 8 (10%) after LARL. Three patients (4%) needed another line creation (LA anterior or mitral isthmus), and AF was not terminated in 1 (1%). Sixty-two patients (78%) could maintain sinus rhythm at 1-year follow-up. During follow-up periods (2.2 +/- 0.8 years), 27 patients recurred AF. 26 of those took second session. Reconduction of PV was found in 13 patients, LARL in 1, CTIL in 1. Other additional line(s) were created for 9 patients with low voltage area(s) in LA. Multiple firing from thoracic veins was found in 8 patients, 2 of whom could not keep sinus rhythm. Sixty-seven (85%) of 79 patients (14 patients required a second session), only PVI, LARL and CTIL created, have passed without no recurrence.

Conclusion: In conclusion, the creation of LARL is extremely effective in fixed AF ablation, which could control the arrhythmogenic substrate for AF.