Introduction: The linear ablation at the left atrial (LA) roof beyond pulmonary vein isolation is one of important ablation techniques for modification of atrial fibrillation (AF) substrate. However, evaluation of complete block across the line is still challenging. We sought to assess the establishment of roof line block by conventional method and using high-density 3D-electroanatomical mapping (EAM) system.

Methods: A total of 68 AF patients (Age: 61±9y, LA diameter: 42±6.3mm, Redo case: 53%) who underwent the linear ablation at the LA roof by using 3.5mm-tip irrigated ablation catheter was enrolled. The definition of roof linear conduction block was demonstration of low-to-high activation on the posterior wall during pacing the left LA appendage or CS distal to capture the LA anterior wall with conventional technique, thereafter the complete conduction block along the roof line was confirmed by using high-density mapping with 3D-EAM. We compared the accuracy of conventional technique for the establishment of roof linear block and examined the conduction pattern when showing pseudo linear conduction block.

Result: In total, block line of LA roof was conventionally confirmed in 58 (85%) patients after the initial roof linear ablation, in which 13 (22%) patients demonstrated incomplete block with a high-density mapping (pseudo block). Of 13 patients with pseudo block, 8 (62%) patients showed wave collision near the roof line (10±5.0mm distance), and remaining 5 (38%) patients demonstrated longitudinal dissociation of wave conduction on the LA posterior wall (Figure). After additional ablation for the gaps on the roof line, complete block was finally confirmed in 66 (97%) patients.

Conclusion: Conventional method for the assessment of conduction block at the LA roof after linear ablation might not be perfect in cases with collision of conduction wave near the roof line or dissociation of longitudinal waves on the LA posterior wall. High-density mapping using 3D-EAM could be useful and might be necessary to confirm the complete roof linear block.