






## CASE REPORT

# Left atrial appendage (LAA) electrical isolation by Maze-like catheter substrate modification in presence of LAA-occluder device: A case report

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**Abstract**

Maze-like linear substrate modification in atrial fibrillation patients nonresponders to pulmonary vein isolation represents a feasible technique to gain left atrial appendage electrical isolation even in the presence of a Watchman occluder device.

**KEYWORDS**

atrial fibrillation, cardiovascular disorder, left atrial appendage occluder, Maze-like ablation

## 1 | INTRODUCTION

A 78-year-old male affected by atrial fibrillation recurrences, already treated with left atrial appendage occluder implantation, pulmonary vein isolation, and substrate modification with anterior and roof line, was referred to our center for a third EP-procedure. We gained electrical isolation of left atrial appendage by performing Maze-like catheter substrate modification.

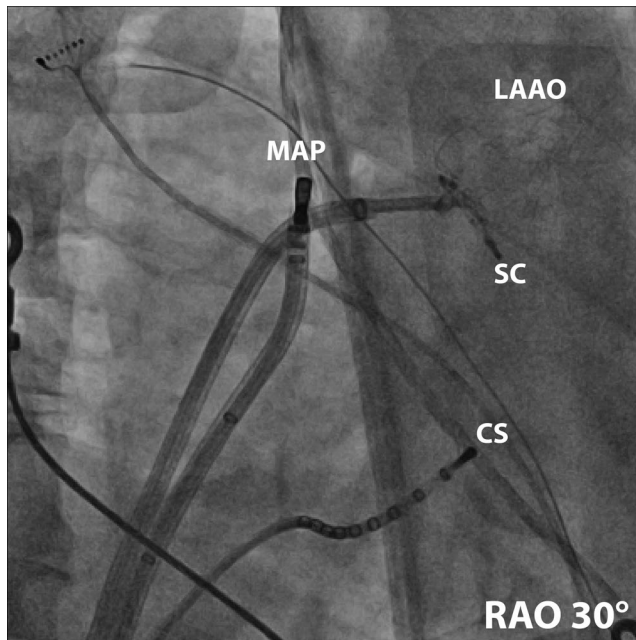
The left atrial appendage (LAA) has a role in triggering and sustaining atrial fibrillation (AF),<sup>1</sup> especially in long-standing persistent AF or in AF recurrences after pulmonary vein isolation (PVI). Electrical isolation of LAA has demonstrated potential benefit in freedom from AF recurrences.<sup>2,3</sup> In the presence of a LAA occluder device (LAAO), electrical ostial isolation of LAA was demonstrated to be feasible but also associated with new peri-device leaks, device dislodgement, and thrombus formation.<sup>4</sup> We now report a case of LAA electrical isolation (LAAI) in a patient with Watchman LAAO using our percutaneous MAZE linear ablation technique.

## 2 | CASE REPORT

A 78-year-old male with symptomatic AF recurrences was referred to our center for a repeat ablation procedure. The patient had a history of arterial hypertension with normal left ventricular function and in 2013 he received in another institution a LAAO implantation (WATCHMAN™ 27 mm Boston Scientific). Thereafter in 2018, he was treated with a PVI with Laserballoon. Later on, in 2018, he experienced AF recurrences under antiarrhythmic therapy and a second ablation procedure was performed: Stable PVI was documented; thereafter, radiofrequency substrate modification with anterior and roof line block was pursued.

After 1 year free from recurrences, despite antiarrhythmic therapy with beta-blocker and amiodarone, the patient still manifested highly symptomatic arrhythmic episodes, so an indication was given to perform a third ablation procedure.

The current ablation was performed with a 3-D electro-anatomical map system (CARTO3, Biosense Webster) and an irrigated tip catheter (Thermocool SF). Durable PVI

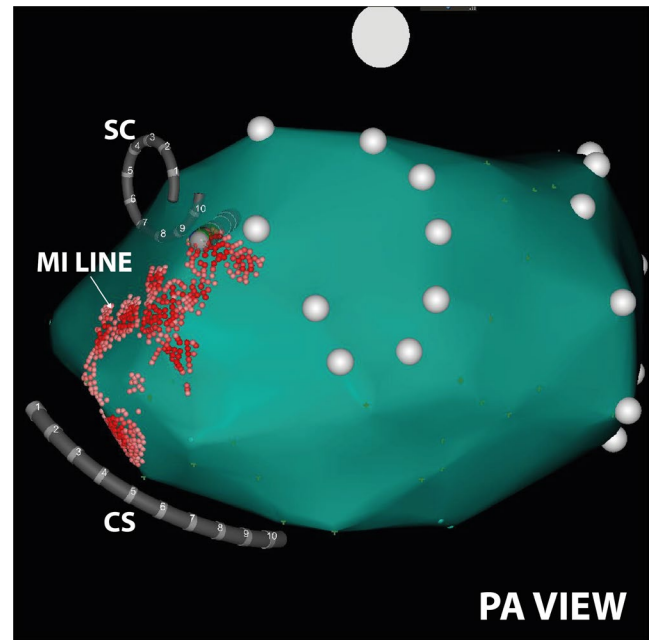


**FIGURE 1** Location of catheters in RAO 30° during ablation at the anterior line, which resulted in LAAI. CS, coronary sinus catheter; LAAI, left atrial appendage isolation; LAAO, left atrial appendage occlude device; MAP, mapping catheter; RAO, right anterior oblique fluoroscopic view; SC, spiral catheter

could be documented. A 3D anatomical reconstruction of the left atrium was performed, suggesting a durable bidirectional block of the previous deployed left atrial lines. We opted for an electrical isolation of the left atrial appendage. A spiral catheter was advanced in the proximal part of the LAA (Figure 1). During sinus rhythm, a mitral isthmus line was deployed between the mitral annulus and the inferior pulmonary vein (Figures 2 and 3A). A dormant conduction of the anterior wall was unmasked: an ablation at the anterior line resulted finally in the LAAI (Figure 3B). No complication occurred; the postprocedural echocardiogram showed no pericardial effusion with normal left ventricular function. The patient was discharged in sinus rhythm, under Dabigatran 150 mg twice daily, switched after 2 months to lone ASA.

### 3 | DISCUSSION

Left atrial appendage electrical isolation after LAAO can be challenging since the occluder can impede (a) catheter manipulation close to the LAA and (b) signal recording from the LAA to confirm isolation. In 2014, Steckman et al<sup>5</sup> achieved LAAI in presence of a LAAO (Amplatzer™ Cardiac Plug) by pursuing left atrial ablation lines: In that report, no signals from the LAA were displayed. A previous multicentric study<sup>4</sup> reported a failure rate of 38% in achieving LAAI in patients with a Watchman Device.



**FIGURE 2** Left atrium anatomical map displaying mitral isthmus line, postero-anterior view. CS, coronary sinus catheter; MI, line mitral isthmus line; SC, spiral catheter

Furthermore, the same study showed a 30% incidence of newly observed peridevice leaks after segmental LAAI. We now report the possibility to achieve LAAI with a “Maze-like” linear substrate modification<sup>3</sup>: The electrical activity from the LAA was easily collected because the Watchman occluder realizes a more distal occlusion compared to other “lobe-disc” LAAO systems. Furthermore, linear LAAI leads to lesion sets that are deployed far away from the device, avoiding the probability of peridevice leaks.

### ACKNOWLEDGMENTS

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### CONFLICT OF INTEREST

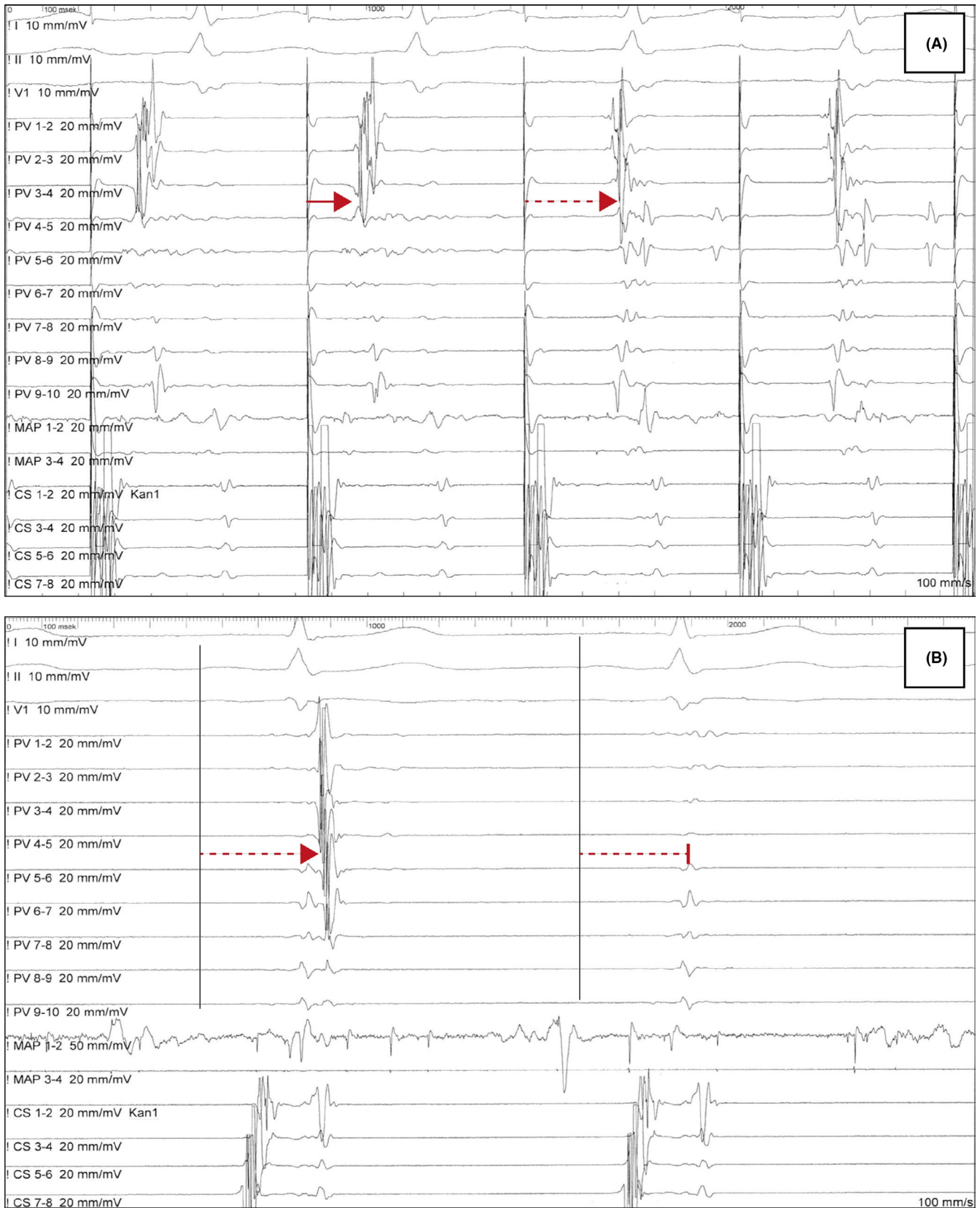
None declared.

### AUTHOR CONTRIBUTIONS

SZ and LB: drafted the manuscript. All other authors contributed to the critical review of the manuscript.

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**FIGURE 3** A, Progressive delay in LAA potential during deployment of mitral isthmus line without LAAI, thus revealing dormant conduction of the anterior wall; B, Real-time LAAI during ablation at the anterior line. LAA, left atrial appendage; LAAI, left atrial appendage isolation

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