








The Marshall-PLAN atrial fibrillation ablation: outcomes in patients with and without complete lesion set

 Ana Jordan*,
 Ivan Zeljković,
 Ante Lisičić,
 Ivica Benko,
 Sanda Sokol Tomić,
 Nikša Bušić,
 Šime Manola,
 Nikola Pavlović

Dubrava University Hospital,
Zagreb, Croatia

KEYWORDS: atrial fibrillation, Marshall-PLAN ablation, complete lesion set, atrial fibrillation recurrence.

CITATION: *Cardiol Croat.* 2024;19(11-12):394. | <https://doi.org/10.15836/ccar2024.394>

***ADDRESS FOR CORRESPONDENCE:** Ana Jordan, Klinička bolnica Dubrava, Avenija Gojka Šuška 6, HR-10000 Zagreb, Croatia. / Phone: +385-98-613-086 / E-mail: anazovko4@gmail.com

ORCID: Ana Jordan, <https://orcid.org/0000-0003-4996-2203> • Ivan Zeljković, <https://orcid.org/0000-0002-4550-4056>
Ante Lisičić, <https://orcid.org/0000-0002-4365-9652> • Ivica Benko, <https://orcid.org/0000-0002-1878-0880>
Sanda Sokol Tomić, <https://orcid.org/0000-0002-4551-9231> • Nikša Bušić, <https://orcid.org/0000-0002-7082-4932>
Šime Manola, <https://orcid.org/0000-0001-6444-2674> • Nikola Pavlović, <https://orcid.org/0000-0001-9187-7681>

Introduction: Persistent atrial fibrillation is associated with more significant atrial structural remodeling and more severe atrial cardiomyopathy compared to paroxysmal AF, making catheter ablation for persistent AF more challenging. Over time, various strategies have been explored to address this complexity. Recently, ethanol ablation of the vein of Marshall (VOM) and a comprehensive ablation approach—Marshall bundle elimination, pulmonary vein isolation, and line completion for anatomical ablation of persistent AF (Marshall-PLAN)—have shown promising results.¹ Since January 2022, we adopted this strategy as the first-line treatment for HFpEF patients with long-standing persistent AF. Our goal was to compare AF recurrence in patients undergoing Marshall-PLAN ablation, both with and without a complete lesion set (in cases where the Marshall vein was either not found or deemed unsuitable for ablation).

Patients and Methods: The case series included 57 consecutive patients with long-standing persistent AF (age 65 ± 2 years; 12 women; AF duration 9 ± 11 months; mean LA index volume was 44 ± 2 ml/m², mean NT-pro BNP was 1202±169). VOM ethanol infusion (median dose 5-9ml ethanol) was completed in 41 patients. 16 patients underwent ablation without a complete lesion set. All patients are enrolled in an institutional registry (CaRD registry-Arrhythmias).

Results: The primary outcome measured was AF recurrence during a one-year follow-up. In the complete lesion set group, AF recurrence occurred in 14 patients (34.1%). In the group without a complete lesion set, AF recurrence was observed in 3 patients (18.8%).

Conclusion: The findings from this study suggest that the use of a complete lesion set (CLS) does not necessarily reduce AF recurrence. This challenges the assumption that achieving a CLS guarantees better clinical outcomes. The complexity and extent of lesions in the CLS group could result in more extensive myocardial damage, potentially leading to a higher incidence of postoperative AF episodes. Additionally, the prolonged procedural duration and associated inflammation may contribute to early recurrence. Individual patient characteristics—such as left atrial size, underlying structural heart disease, or the presence of fibrosis—are also important factors that could influence outcomes. Future studies should focus on identifying patient-specific factors that predict the success of complete lesion sets in AF ablation.

RECEIVED:
September 29, 2024

ACCEPTED:
October 31, 2024



LITERATURE

1. Derval N, Duchateau J, Denis A, Ramirez FD, Mahida S, André C, et al. Marshall bundle elimination, Pulmonary vein isolation, and Line completion for Anatomical ablation of persistent atrial fibrillation (Marshall-PLAN): Prospective, single-center study. *Heart Rhythm.* 2021 Apr;18(4):529-537. <https://doi.org/10.1016/j.hrthm.2020.12.023>