







Initial experience and outcomes of Marshall-PLAN ablation strategy for persistent atrial fibrillation

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Introduction: Pulmonary vein isolation (PVI) is the cornerstone of atrial fibrillation (AF) ablation, however with still a significant recurrence rates in patients with persistent AF.¹ Recently, ethanol ablation of the vein of Marshall (VOM) and a comprehensive ablation strategy (Marshall bundle elimination, Pulmonary vein isolation, and Line completion for anatomical ablation of persistent atrial fibrillation [Marshall-PLAN]) have been developed for ablation of persistent AF with promising results.² We adopted this strategy for the first time ablation in patients with persistent AF since January 2022.

Patients and Methods: Left atrial (LA) sites were sequentially targeted for ablation as follows: (1) coronary sinus and vein of Marshall (CS-VOM) musculature; (2) PVI; and (3) anatomical isthmuses (mitral, roof, and cavotricuspid isthmus [CTI]). The primary endpoint was 6-month freedom from AF/atrial tachycardia (AT).

Results: The case series included 20 consecutive patients with persistent AF. The median age was 66.5 years (IQR 63.25 – 69.25). The mean AF duration was 9 ± 11 months and mean LA index volume was 47 ± 7 ml/m². VOM ethanol infusion was completed in 14 patients (median dose 5 ml). One patient had a coronary sinus dissection, and in five patients the VOM was not found or considered too small for infusion (<1mm). The full Marshall-PLAN lesion set (VOM, PVI, mitral, roof) was completed in 13 patients. One patient had only VOM ablation due to an unsuccessful transeptal puncture. The mean procedural time and fluoroscopy time were 160±74 minutes, and 17±6,8 minutes respectively. At a follow-up (2.25-8 months), all patients were free from AF/AT after a single procedure. Compared to 15 historical patients with persistent AF in whom PVI only was performed, procedures were significantly longer with longer use of fluoroscopy (160±74 vs 90±20, p=0.001; 17±6.8 vs 5± 3 minutes, p<0.001).

Conclusion: Based on initial experience, ablation according to the Marshall-PLAN protocol is a feasible and safe procedure for increasing the success rates of sinus rhythm maintenance in patients with persistent AF. Although our numbers are still small, initial results are comparable to larger trials.

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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>
2. Lador A, Peterson LE, Swarup V, Schurmann PA, Makkar A, Doshi RN, et al. Determinants of outcome impact of vein of Marshall ethanol infusion when added to catheter ablation of persistent atrial fibrillation: A secondary analysis of the VENUS randomized clinical trial. *Heart Rhythm.* 2021 Jul;18(7):1045-1054. <https://doi.org/10.1016/j.hrthm.2021.01.005>