

## Atrial Substrate and Triggers of Paroxysmal Atrial Fibrillation in Patients With Obstructive Sleep Apnea

Anter et al. Circulation: Arrhythmia and Electrophysiology. 10(11):e005407, NOV 2017

### + Objective

- Obstructive sleep apnea (OSA) is associated with atrial remodeling, atrial fibrillation (AF) and increased arrhythmia recurrence post pulmonary vein (PV) isolation. This study aims to map the atrial substrate, including identification of AF triggers in patients with paroxysmal AF (PAF) and OSA.

### + Methods

- 86 patients with PAF (43 with ≥moderate OSA [apnea–hypopnea index ≥15] and 43 without OSA [apnea–hypopnea index <5]), right atrial and left atrial voltage distribution, conduction velocities and electrogram characteristics were analyzed during atrial pacing.
- 2 control patients group with normal sleep study and with ≥moderate OSA who underwent PVI alone without mapping and ablation of extra-PV triggers were identified prospectively.
- All 4 groups underwent full substrate evaluation with 3D mapping and ablation.
- AF triggers were examined before and after PV isolation and targeted for ablation.
- Patients with OSA had lower atrial voltage amplitude (right atrial,  $P=0.0005$ ; left atrial,  $P=0.0001$ ), slower conduction velocities (right atrial,  $P=0.02$ ; left atrial,  $P=0.0002$ ) and higher prevalence of electrogram fractionation ( $P=0.0001$ ).
- The areas of atrial abnormality were consistent among patients, most commonly involving the left atrial septum (32/43; 74.4%).

### + Results

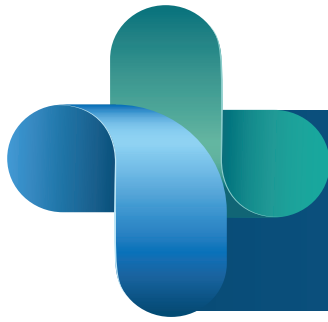
- The PVs were the most frequent triggers for AF in both groups; however, after PV isolation patients with OSA had increased incidence of additional extra-PV triggers (41.8% versus 11.6%;  $P=0.003$ ).
- The 1-year arrhythmia-free survival was similar between patients with and without OSA (83.7% and 81.4%, respectively;  $P=0.59$ ) that undergo both PVI and Non-PV Trigger ablation.
- Control patients with PAF and OSA who underwent PV isolation alone without ablation on extra-PV triggers had increased risk of arrhythmia recurrence (83.7% versus 64.0%;  $P=0.003$ ).

### + Conclusion

- OSA is associated with structural and functional atrial remodeling and increased incidence of extra-PV triggers.
- Elimination of these triggers resulted in improved arrhythmia-free survival.

### + Key Takeaways

- OSA is associated with structural and functional atrial remodeling.
- More non-PV triggers elimination improves ablation outcome.
- Sleep studies before ablation may help to define the ablation strategy.



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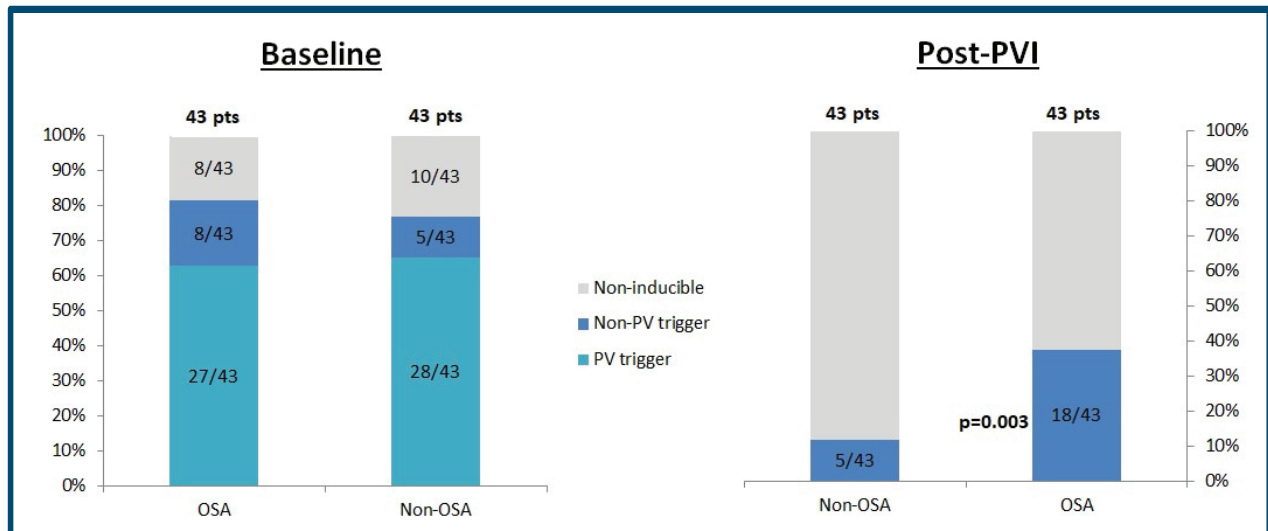


Figure 1. Distribution of atrial fibrillation (AF) triggers in patients with and without obstructive sleep apnea (OSA). PVI indicates pulmonary vein isolation.

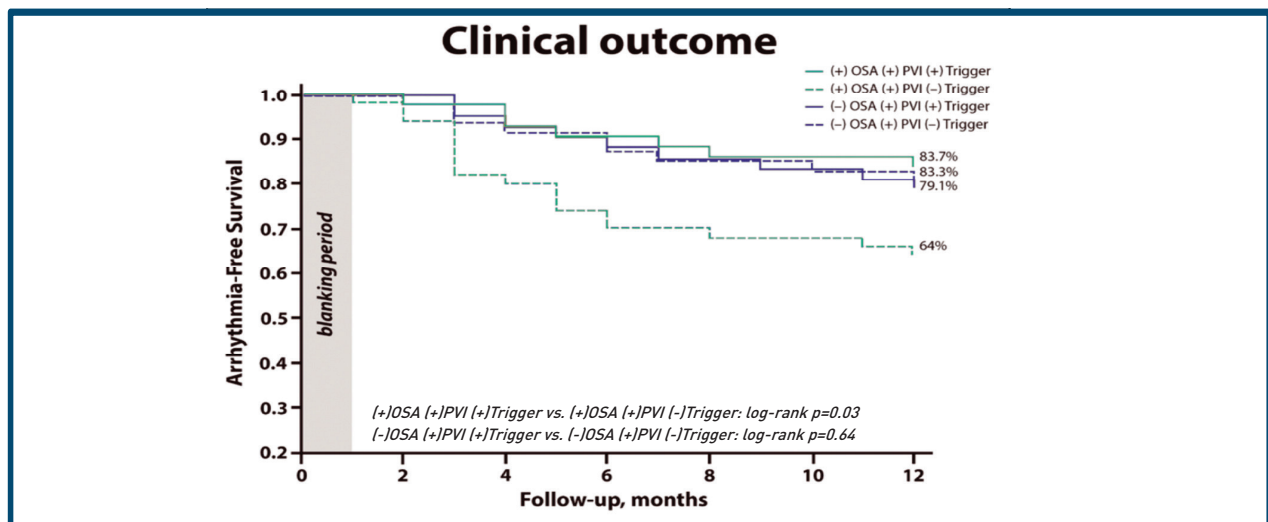


Figure 2. Kaplan–Meier survival curves according to treatment groups. OSA indicates obstructive sleep apnea; and PVI, pulmonary vein isolation.