



CLINICAL SUMMARY

AF Ablation Guided by Spatiotemporal Electrogram Dispersion Without Pulmonary Vein Isolation

Seitz, et al. J Am Coll Cardiol. 2017; 69(3):303-321 DOI: 10.1016/J.jacc.2016.10.065

Objective

The authors **evaluated the usefulness of spatiotemporal dispersion**, a visually recognizable electric footprint of AF drivers, for the ablation of all forms of AF.

Dispersion as a Patient Population

De novo drug-refractory AF patients from Hospital St. Joseph, Marseille, Institut Mutualiste Monsouris, Paris and Centre Hospitalier Universitaire, Nice (September 2013–July 2014) were prospectively enrolled.

Study Group: Ablation of Dispersion only (105 pts) vs. Control Group: Patients with

Paroxysmal AF: antral PVI only (9 pts)

Persistent AF: ablation using the stepwise approach (38 pts)

Patient characteristics of study group:

Similar in both study and control groups

Age 63 ± 11 years, 80 males

Maximum AF duration 12.2 ± 20 months

24 pts with Paroxysmal AF

81 pts with Nonparoxysmal AF

Spontaneous AF at the beginning of procedure (persistent and longstanding persistent AF only) 65 pts

Key Takeaways

- ⚡ The authors concluded the **clustering of intracardiac electrograms exhibiting spatiotemporal dispersion** was indicative of AF drivers
- ⚡ First case ablation at dispersion areas **terminated AF in 95% of the 105 patients**
- ⚡ At 18 months of follow-up: **the atrial arrhythmia (AF/AT) recurrence rate was 15% after 1.4 ± 0.5 procedures per patient** versus 41% for the validation set in the control group after 1.5 ± 0.5 procedures per patient
- ⚡ The clustering of intracardiac electrograms exhibiting spatiotemporal dispersion **may guide a wholly patient-tailored ablation of all types of AF**

Methods

Dispersion Guided Ablation (105 pts)

The endpoint of ablation of areas of dispersion was AF termination defined as conversion to SR or a stable atrial tachycardia (AT). Post-ablation ATs were mapped and ablated until conversion to SR.

If AF did not terminate after ablation of the pre-selected dispersion area regions, a new multielectrode sequential map was performed (remapping)

If 2 ablated areas were very close (<1cm), they were connected by RF applications

- Neither PV isolation nor linear ablation was performed

PVI +/- Stepwise Approach (47 pts)

Ablation of persistent or long lasting persistent AF was performed sequentially, and involved pulmonary vein isolation, electrogram-based ablation, and linear ablation, with termination of AF via ablation being the endpoint

Limitations

An evaluation of dispersion area ablation in a larger patient population using a randomized study design is warranted

Procedural endpoints such as AF termination, SR conversion, or AF non-inducibility need to be interpreted with caution

In 13 additional patients, in whom only performed dispersion ablation, only 2 of 52 PVs were isolated unintentionally

Inducibility maneuvers were withheld after 2 hours

Additional Findings

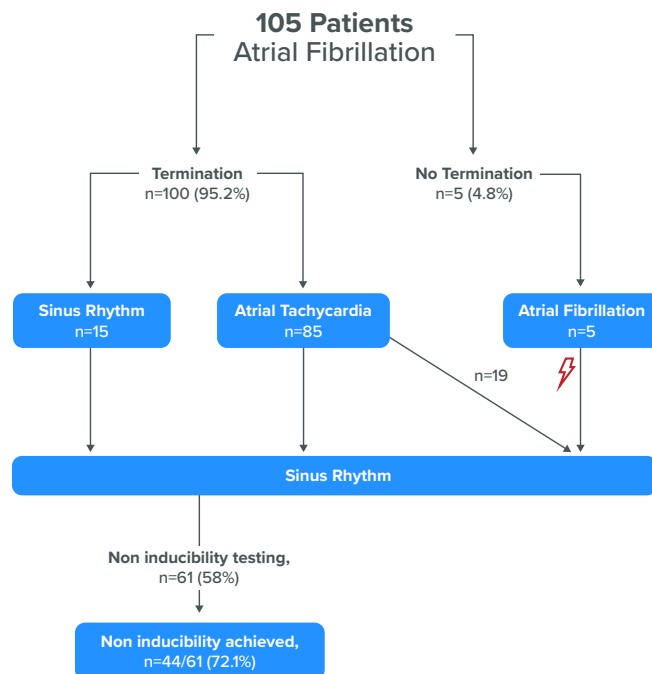
Ablation was performed in both the LA and RA in 51% of patients

The visual analysis of the 4 operators was completely concordant in 94.3% of the analyzed electrograms (interobserver variability equal to 6.7%). The intraobserver variability of the visual analysis was $2 \pm 2\%$.

High degree of temporal stability in the spatial distribution of dispersion regions

In patients in "spontaneous" AF at the procedure outset, AF termination was obtained in 60 (92%). AF termination was obtained in all patients in whom AF was pace-induced ($n = 40$; $p = 0.15$).

Fig. 1: Procedural Outcomes



Conclusions

- ✓ After dispersion ablation, the majority (75.6%) of recurrences were organized AT and not AF
- ✓ Long-term outcomes showed 85% of patients free from any arrhythmia after ~1.4 procedures per patient in a population with 77% of persistent and longstanding AF

What is Dispersion?

Dispersion areas are defined as clusters of electrograms, either fractionated or nonfractionated, that displayed interelectrode time and space dispersion at a minimum of 3 adjacent bipoles such that activation spread over all the AFCL.

Fig. 2: Spatiotemporal Dispersion of Multipolar Electrograms

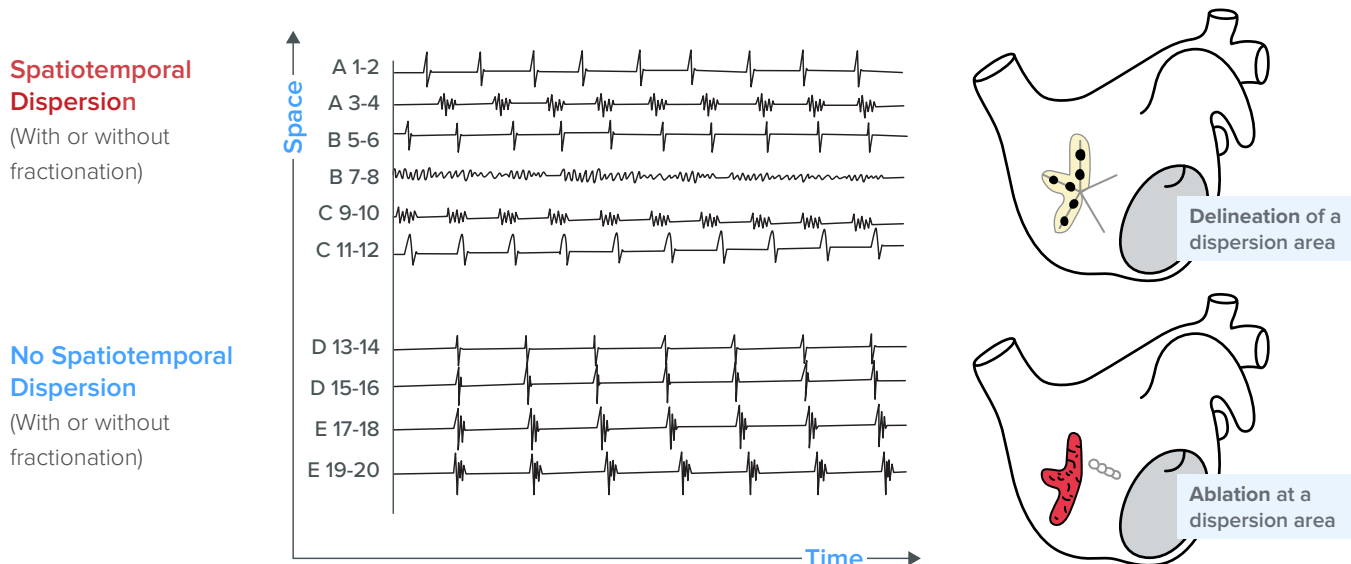
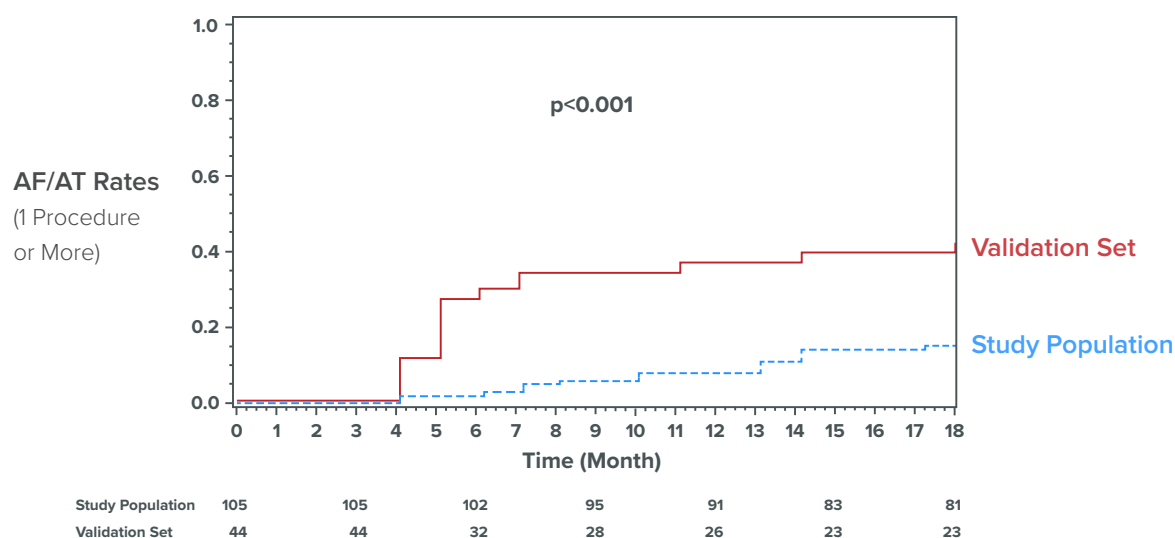


Fig. 3: 18-Month Outcome





ABOUT VOLTA MEDICAL



Volta Medical leverages artificial intelligence to revolutionize interventional cardiac electrophysiology. Its cutting-edge software solutions use machine and deep learning algorithms to assist operators during cardiac ablation procedures. Founded in 2016, Volta Medical is based in Marseille, France.

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