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The role of ultra-high density mapping system to unveil hidden signals: A case report

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Background: Atypical Atrial Flutter (AAFL) is often associated with structural heart disease, especially in patients that have undergone cardiac surgery or extensive catheter ablation for the treatment of AF (Atrial Fibrillation).

Method: We present the case of a 60-year-old female with history of multiple AF ablations referred to our hospital for symptomatic persistent AAFL that was finally eliminated using a novel Ultra-High Density (UHD) mapping system. The 3D atrial geometry was created from the basket mapping catheter IntellaMap ORION™ and the RHYTHMIA™ mapping system. A trans-septal access was carried out in order to complete the electro-anatomic map of the left atrium.

Result: The activation map revealed an isthmus of slow conduction localized along the inferior part of the left inferior pulmonary vein. Analysis of EGM potentials revealed a concordance with the meso-diastolic activation. Interesting, the appearance of these potentials were detectable only on Orion basket whereas the ablation catheter did not revealed any sign of atrial activation. A single shot radiofrequency application of less than 60 sec along the critical isthmus channel promptly interrupted the arrhythmia and the sinus rhythm was restored. Patient remained free from AAFL recurrence and symptom after 6-month follow-up.

Conclusion: In this case the small, close, and low-noise mini-electrodes of orion catheter allow us to identify the critical isthmus of arrhythmia (represented by an extremely low voltage meso-diastolic potential) completely not recognizable by the ablation catheter. UHD mapping seems to be of a primary importance in patients with substrate-related atrial tachycardia and previously failed ablation.

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