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From high-density mapping to low-density mapping: an approach to delineate the active circuit in complex atrial reentrant tachycardias

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Background: High-density activation maps during complex atrial reentrant tachycardias are challenging to interpret as they include the activation patterns of active and passive circuits. Entrainment mapping provides the identification of the active tachycardia circuit. However, current electroanatomic mapping systems are not capable to color-coded the information obtained from entrainment maneuvers.

Objectives: We sought to describe a mapping approach for ablation of complex atrial reentrant tachycardias in which high-density activation maps are transformed into low-density activation maps only displaying the active part of the tachycardia circuit.

Methods: We included consecutive patients with atypical atrial flutter. A high-density activation map was acquired during the index tachycardia. Subsequently, entrainment maneuvers were performed to generate a low-density activation map in which only the activation of the atria directly involved in the flutter circuit was displayed.

Results: Seventeen patients were included 82% male, mean age was 62 ± 7 years. Structural heart disease was present in 59% and 53% had a prior left atrial ablation procedure. Low-density activation maps were successfully generated from an average of 14 ± 3 entrainment points. Twenty circuits (95%) were identified in the left atrium and 1 (5%) in the right atrium. Ablation guided by low-density mapping successfully terminated all ARTs in 267 ± 353 seconds of radiofrequency application.

Conclusion: Low-density mapping based on entrainment maneuvers provides a precise delineation of the active circuit during complex ARTs and resulted in successful arrhythmia termination. This approach can be easily incorporated into clinical practice.