The Relationship between Low Voltage Zone and the Mechanism of Atrial Tachycardia

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Some atrial tachycardias (AT) are related to low voltage zone (LVZ, <0.5 mV). To examine this issue, 25 ATs (24 right ATs and one left AT) in 17 patients with LVZ were analyzed using EnSite Array (EA). Eight patients underwent previous open heart surgeries. Contact bipolar voltage map of right or left atrium was constructed during sinus rhythm using EA, and the location of LVZ (<0.5 mV) was identified. After AT induction, a virtual activation map of the AT was created, and superimposed on the pre-constructed contact voltage map. The virtual activation of the AT was analyzed in relation to the location of LVZ. In a total of 16 focal ATs, 12 ATs were originated from LVZ and 4 outside LVZ. Nine macroreentrant ATs had a reentry circuit involving a narrow conducting channel between the neighboring LVZ (scar) or between the IVC and LVZ (scar). Focal ATs were ablated at the focus while macroreentrant ATs were ablated at the channel, and all the ATs were eliminated by radiofrequency catheter ablation with 10±7 times of energy applications. No complication occurred. All patients were free from any symptoms during 11±5 months follow-up. In conclusion, LVZ, if present, is not only associated with macroreentrant mechanism but also with focal mechanism.

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