

Optimization of superior vena cava isolation with aid of ablation index guidance

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Abstract

Objective: To investigate the optimal range of quantitative ablation index (AI) value during superior vena cava (SVC) electrical isolation by radiofrequency catheter ablation (RFCA). **Methods:** First, in a development cohort of patients with atrial fibrillation (AF), the RFCA with 40W was performed to complete SVC isolation guided by the conduction breakthrough point from the right atrium to SVC. Then, the range of AI value was calculated by offline analysis on different segments of SVC. Lastly, for the validation of AF patients, the safety and effectiveness of SVC isolation with the optimized target range of AI value were evaluated with an additional adenosine test. **Results:** A total of 101 patients with AF were included in the study (44 patients in the development cohort / 57 in the validation cohort). The segmental ablation strategy was applied in 70% of the patients. According to the offline analysis of the AI values in the development cohort, the target AI value range was set as 350-400. The success rate of SVC isolation in the validation cohort was significantly higher than that in the exploration cohort (100% vs 90.9%, $P = 0.02$), and no complications occurred in the exploration cohort. During the adenosine test, the recovery rate of electrical conduction in SVC was significantly lower than that in the pulmonary vein (3.5% vs 17.5%). **Conclusion:** The target AI value with a range from 350 to 400 is safe and effective for high-power RFCA to complete SVC isolation.

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