Biatrial Substrate Properties in Patients with Atrial Fibrillation

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摘要

Abstract

Introduction: The atrial substrate plays an important role in the maintenance of atrial fibrillation (AF). Further investigation of the biatrial substrate may be helpful for understanding the mechanism of AF. The aim of this study was to investigate the properties of right and left atrial (RA and LA) substrate in AF patients and their impact on the catheter ablation.

Methods: Biatrial electroanatomic mapping using a three-dimensional mapping system (NavX) was performed in 117 consecutive patients with paroxysmal (n = 99) and persistent (n = 18) AF. The biatrial voltage and total activation time (TAT) were obtained during sinus rhythm.

Results: The LA had a lower voltage (1.6 ± 0.5 vs 2.0 ± 0.6 mV, $P < 0.001$) than the RA. The TAT correlated with the voltage ($r = –0.65$, $P < 0.001$). The patients with persistent AF had a lower atrial voltage, higher coefficient of variance for the LA voltage, longer LA TAT, and more extensive scar than those with paroxysmal. The patients with recurrent AF after catheter ablation had a lower LA voltage and higher incidence of LA scarring than those without recurrence. A scar located in the low anteroseptal or low posterior wall of LA was related to recurrence of AF. LA scarring was the independent predictor of AF recurrence after catheter ablation.

Conclusion: The LA voltage was lower than the RA, and the atrial voltage correlated with the TAT. Electroanatomical remodeling of the atria could be crucial to the maintenance of AF. The LA substrate properties may play an important role in the recurrence of AF after catheter ablation of AF.

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