Impact of vagal denervation on recurrence of atrial fibrillation after pulmonary vein isolation

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Introduction: Besides elimination of pulmonary vein trigger, vagal denervation is one of mechanisms of atrial fibrillation prevention after pulmonary vein isolation (PVI). We sought to evaluate (1) vagal denervation as assessed by change of sinus cycle length (SCL), AV block cycle length (AVBCL) and refractory period of AV node (AVNERP) after PVI and impact of vagal denervation on recurrence of AF in (2) paroxysmal AF and (3) persistent AF patients.

Methods: A total of 50 consecutive paroxysmal AF (PAF) patients who underwent their first PVI was selected from our prospective AF registry. All patients underwent measurement of SCL, AVBCL, AVNERP before and after PVI. Additional 103 patients with persistent AF patients underwent measurement of SCL, AVBCL, AVNERP after PVI. Systematic follow-up for recurrence of atrial fibrillation was done in all patients.

Result: (1) SCL, AVBCL and AVNERP decreased by 231 ± 143, 87 ± 75, 98 ± 137 ms respectively after PVI in PAF patients. (2) AF recurred in 14 patients (28.0%) within 3 months after PVI in PAF patients. There was no difference AVBCL, AVNERP between PAF groups with and without recurrence. The SCL post PVI was the only significant different between no recurrence and recurrence group (762 ± 96ms vs 683 ± 101ms, P=0.015). Optimal cut-off post-PVI SCL for predicting the early recurrence was 693 ms. During the median follow up period 220 days, AF recurred in 12 patients. There was no difference in SCL, AVBCL, AVNERP after PVI, delta SCL, delta AVBCL, delta AVNERP between groups with AF recurrence and without recurrence in PAF group. (3) Post ablation SCL, AVBCL, AVNERP was not different in persistent AF patients with and without both early and late recurrence.

Conclusion: Vagal denervation was observed in majority of AF patients undergoing PVI. However, markers of vagal denervation were not associated with recurrence of AF in paroxysmal and persistent AF patients.