Extent of self-adjustment to atrial fibrillation determines suitability of an aggressive sinus maintenance therapy in long-persistent atrial fibrillation patients.

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**Introduction**: Lately, catheter ablation (RFCA) was performed even for persistent atrial fibrillation (AF). However, sinus rhythm (SR) maintenance rate of RFCA for persistent AF varied. Accordingly, the suitability of RFCA for persistent-AF remained to be studied. Perpetuation of AF can lead to deterioration in heart condition. However, a large number of persistent-AF patients become less symptomatic even though AF continues. Furthermore, the adverse impact of new onset AF on congestive heart failure is reported to cease in approximately 2 years. This suggests that some suitable self-adjustment to AF exists. We investigated the extent of the self-adjustment to AF by measuring exercise capacity (EC) before and after SR maintenance by RFCA. We sought to clarify whether the extent of self-adjustment could help in determining the suitability of RFCA for persistent-AF.

**Methods**: Two hundred consecutive persistent-AF patients (>6 months) referred for catheter ablation and evaluated for EC before the procedure (male: 155, female: 45). Cardiopulmonary exercise test (CPX) was performed to measure peak Oxygen intake (PVO) at baseline. %PVO was calculated by standardizing PVO to age and gender. During catheter ablation, a Swan-Ganz catheter study was performed before and after defibrillation. Four PVI with or without additional procedures were performed. After >6 months SR-maintenance, CPX was repeated.

**Result**: %PVO varied from 38 to 175% before RFCA. Out of 200 patients, 156 obtained >6 months SR-maintenance and undertook CPX again. Changes in %PVO ranged from -28% to 126% (median: 8.3%). According to multi-regression analysis of relationship between changes in %PVO and clinical parameters, persistent-AF patients with lower %PVO before RFCA (t = -4.92, p<0.001) and greater difference in heart rate (HR) from at rest to peak during repeated CPX (t = 5.92, p<0.001), obtained larger improvement in EC through SR maintenance. In particular, %PVO before RFCA was the sole predictor of change in EC after SR-maintenance. Accordingly, we considered %PVO before RFCA as the most reliable indicator of extent of self-adjustment to AF in persistent-AF patients. Furthermore, when we determined the suitability of RFCA for long persistent-AF patients, we need to recognize that chronotropic incompetence in SR can lead to insufficient recovery of EC after SR-maintenance in long persistent-AF patients.

**Conclusion**: The extent to which persistent-AF patients could or could not adjust to AF helps in evaluating the significance of SR maintenance and determining the suitability of aggressive SR-maintenance therapy by RFCA.