

## Heart Conditioning As Healthy Strategy in Restoration of Chronic Atrial Fibrillation :

## A Case Report

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Taichung, Taiwan.**Submitted : 27 Dec 2024 ; Published : 28 Jan 2025****Citation:** Lee, A. Y. S. et al. (2025). Heart Conditioning As Healthy Strategy in Restoration of Chronic Atrial Fibrillation: A Case Report. *I J cardio & card diso*; 6(1):1-3. DOI : <https://doi.org/10.47485/2998-4513.1039>**Abstract**

*We describe the case of a 46-year-old woman with chronic atrial fibrillation for 3 years who refused catheter ablation. She was treated medically, and remote ischemic conditioning as healthy strategy was delivered once daily. To our surprise, 3 years later, her chronic atrial fibrillation converted and restored to sinus rhythm. Her symptoms were dramatically relieved.*

**Keywords:** Chronic atrial fibrillation; heart conditioning; healthy strategy.

Atrial fibrillation (AF) is the most common sustained cardiac rhythm disorder, and confers a substantial mortality and morbidity from stroke, thromboembolism, heart failure, and impaired quality of life. It is commonly associated with hypertension, coronary artery disease, heart failure, valvular heart disease etc.

In 1986, Murry et al. demonstrated for the first time ischemic preconditioning in dogs (Murry et al., 1986). Repeated short (5 minutes) occlusions of the coronary artery before subsequent sustained occlusion resulted in a reduction in infarct size.

Remote ischemic conditioning (RIC) with mild ischemia and reperfusion of a distant organ also protects the heart. It is non-invasive and typically uses intermittent inflation of a standard blood pressure cuff to 200 mmHg, with three to four 5-minute inflation periods separated by 5-minute reperfusion periods (Heusch et al., 2015). In patients who underwent cardiac catheterization or cardiac surgery, RIC decreased cardiac injury and serious adverse cardiovascular and cerebrovascular events (Hode et al., 2009).

Recently, it has been demonstrated that heart conditioning can be used as a healthy strategy consistent with the heterochronic parabiotic model in reversing disease and aging (Lee, 2023). In this sense, heart conditioning may be beneficial for patients with chronic AF.

**Case Report**

A 46-year-old woman without comorbidity presented with dyspnea on exertion, chest tightness, palpitation and dizziness. She suffered from hypertensive heart disease and chronic AF

and was regularly treated at another clinic for the past two years. This study was approved by the Ethic Committee of Jen Ai Hospital. Written consent was obtained from the patient for publication of this case report and all accompanying images.

Physical examination was essentially normal. Chest X-ray showed cardiomegaly. Electrocardiogram showed atrial fibrillation. Myocardial perfusion imaging showed moderate ischemia on the anteroseptal and lateral walls of the left ventricle. Transthoracic echocardiography (Table I) showed left atrial and ventricular dilatation, and hypokinesis in posterolateral wall, with ejection fraction of 44%. Holter electrocardiogram showed atrial fibrillation, with episodes of 13900 ventricular premature beats, 18 ventricular couplets and 3 short-run ventricular tachycardia. She was treated for chronic AF, ventricular arrhythmias, hypertension, coronary artery disease with stable angina and symptoms improved.

We recommended catheter ablation for her chronic AF, but the patient strongly refused. Thereafter, we continued the current drug treatment and performed RIC treatment once a day. In each RIC treatment, an automated healthy sphygmomanometer (Urion Co, China) was used. A standard blood pressure cuff was applied to the upper arm and inflated to a pressure of 200mmHg for 3 minutes, after which the cuff was deflated automatically. The RIC treatment was performed by the patient himself once a day at home. A doctor confirmed that our patient operated the RIC correctly during the first week. To our great surprise, after 3 years, electrocardiogram showed sinus rhythm and transthoracic echocardiography showed sinus rhythm with normal chamber size and systolic function. Her symptoms were significantly alleviated.

**Table 1:** Changes in echocardiographic parameters in our patient.

	LVDd (mm)	LVSd (mm)	LA (mm)	IVS (mm)	PW (mm)	EF (%)	rhythm
Before RIC	62	41	58	9	9	44%	AF
2 years after RIC	58	41	48	9	8	45%	AF
3 years after RIC	56	36	45	10	9	67%	sinus rhythm

### Abbreviations

LVDd : left ventricular end diastolic dimension;  
LVSd : left ventricular end systolic dimension;  
LA : left atrial dimension;  
IVS : intraventricular septum;  
PW : posterior wall;  
EF : left ventricular ejection fraction;  
AF : atrial fibrillation;  
RIC : remote ischemic conditioning.

### Discussion

This case suggested that 3 years of RIC treatment as a healthy strategy was able to reverse chronic AF in our patient, compatible to the previous studies that RIC reduced the incidence, inducibility and substability of AF (Candilio et al., 2015; Han et al., 2018; Kosiuk et al., 2019).

Ventricular remodeling refers to changes in the geometry, structure, and function of the heart. It is the main process of heart failure, which is linked to decreased ejection fraction, disease progression and clinical outcomes (Aimo et al., 2019). In one study, reverse remodeling was defined as an increase in LVEF of more than 15% or an increase in LVEF of more than 10% along with improvements in left ventricular end-systolic parameters for one year (Lupon et al., 2015). Another study suggested that a reduction in end-systolic and end-diastolic volume correlates with reverse remodeling (Mathias et al., 2016). In the present case, improvement was achieved after 3 years of RIC treatment, including a decrease in left atrial and left ventricular diastolic and systolic diameters and increase in ejection fraction in our patient, respectively. We hypothesize that RIC is stress on the heart that triggers compensatory mechanisms that release healthy factors such as cardioprotective factors and eliminate unhealthy factors such as free radicals (Lee, 2023). This beneficial cycle results in reversion of disease, consistent with the heterochronic parabiotic model, as demonstrated by reverse remodeling and restoration of chronic AF in this case (Lee, 2023).

Overall, this case shows that heart conditioning as a healthy strategy is a valuable, safe and effective adjunctive treatment for patients with chronic AF that could affect cardiac reverse remodeling and recovery, as well as on quality of life. Daily use of RIC for 3 years as a healthy strategy has never been reported. Further randomized controlled trials with larger numbers of enrolled patients are needed to confirm these results and explore other clinical outcomes.

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### Credit Authorship Contribution Statement

All authors participated in the design, interpretation of the case and review of the manuscript.

### Declaration of Competing Interest

The authors declare that there is no conflict of interest.

### Patient Permission/Consent statement

This study was approved by the Ethic Committee of Jen Ai Hospital. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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