



EDITORIAL COMMENT

Left ventricular improvement after catheter ablation of atrial fibrillation: What ablation procedure and for whom?



Melhoria da função ventricular esquerda após ablação por cateter de fibrilhação auricular. Que tipo de procedimento de ablação e para quem?

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It is well known that high heart rate, loss of atrial systole and variable diastolic time resulting from atrial fibrillation (AF) induce heart failure (HF), and that pathophysiological hemodynamic and hormonal mechanisms involved in HF create conditions for AF occurrence and maintenance.¹ When these disorders coexist, a vicious circle is thus created. In this context, it seems obvious that restoring and maintaining sinus rhythm in patients with HF and AF should lead to clinical benefits. However, several clinical studies performed over the years have failed to demonstrate significant improvement in clinical endpoints by maintaining sinus rhythm with antiarrhythmic drugs compared to heart rate control.^{2–4}

In the Rhythm Control Versus Rate Control for Atrial Fibrillation and Heart Failure (AF-CHF) trial,³ a randomized study comparing rhythm control with ventricular rate control in patients with HF (left ventricular ejection fraction [LVEF] <35%) and AF, no significant benefit of rhythm control was demonstrated in mortality or surrogate clinical endpoints. One possible explanation for those results was the

adverse effects of antiarrhythmic drugs, which may have counterbalanced the potential benefit of maintaining sinus rhythm.² However, no clinical benefit was demonstrated even when antiarrhythmic drugs recommended for patients with HF, such as dofetilide and amiodarone, were used in clinical studies.^{3,4}

More recently, rhythm control has been demonstrated to be an effective strategy for AF when catheter ablation is used to treat selected patients with heart failure and reduced LVEF.^{5–7} CASTLE-AF, a multicenter study involving patients with these characteristics, first demonstrated reductions in all-cause mortality and cardiovascular mortality after catheter ablation. Additionally, patients undergoing catheter ablation presented lower hospitalization rates due to heart failure, lower AF burden, and improvements in LVEF and physical capacity.⁵ Data from other studies have confirmed these observations.^{6,7}

In the CAMTAF trial, a randomized controlled trial of catheter ablation versus medical treatment of atrial fibrillation in heart failure, patients with HF (LVEF <50% and New York Heart Association [NYHA] functional classes II and III) and persistent AF were randomized to medical heart rate control (24 patients) or catheter ablation

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(26 patients). Although most patients required more than one procedure, freedom from AF after the last ablation procedure was achieved in 19/26 patients (73%) off antiarrhythmic drugs. There was a significant improvement in LVEF in the ablation group ($40\pm 12\%$) compared with the rate-control group ($31\pm 13\%$) ($p=0.015$). Ablation was also associated with better scores on the Minnesota Living with Heart Failure Questionnaire compared to heart rate control (24 ± 22 vs. 47 ± 22 ; $p=0.001$).⁶

The Ablation Versus Amiodarone For Treatment Of Persistent Atrial Fibrillation In Patients With Congestive Heart Failure And An Implanted Device (AATAC) trial was an open-label, randomized, parallel-group, multicenter study assessing patients with AF and heart failure (NYHA II to III and LVEF $<40\%$), who received a dual-chamber implantable cardioverter-defibrillator or cardiac resynchronization therapy. Patients were randomly assigned to undergo catheter ablation ($n=102$) or medical treatment with amiodarone ($n=101$). In this study, AF recurrence was planned as the primary endpoint and all-cause mortality and unplanned hospitalization as the secondary endpoints. During a minimum follow-up of 24 months, 71 (70%) patients in the ablation group were free of recurrence after one or more procedures, compared to 34 (34%) patients in the amiodarone group ($p<0.001$). The unplanned hospitalization rate was 31% in the ablation group and 57% in the amiodarone group ($p<0.001$). More importantly, significantly lower mortality was observed in the catheter ablation group (8% vs. 18%, $p=0.03$).⁷

In this issue of the *Journal*, Ribeiro et al.⁸ retrospectively assess a group of 153 patients who underwent AF ablation between July 2016 and November 2018. Of these, 22 patients with heart failure (32% NYHA class II and 58% class III) and LVEF $<50\%$ fulfilled the inclusion criteria. Selected patients were presumed to have persistent tachycardia related to AF, but left ventricular dysfunction could have been caused by dilated cardiomyopathy.⁸

Although the study included a small number of patients, the results were favorable to rhythm control and in agreement with recent publications. In a mean follow-up of 11 months, catheter ablation resulted in an increase in LVEF from 40% to 58% ($p<0.01$) and NYHA functional class improved from 2.35 ± 0.49 to 1.3 ± 0.47 ($p<0.001$). Additionally, left atrial and left ventricular dimensions decreased from 48.0 mm to 44 mm ($p<0.01$) and from 61.0 mm to 55.0 mm ($p<0.1$), respectively.⁸

Despite these important observations, there are still many unanswered questions regarding this subject. For example, are these results reproducible in HF patients with different profiles? It should be borne in mind that CASTLE-AF assessed 3013 patients for eligibility, of whom only 363 were included in the primary analysis. Is AF ablation as effective in patients with previous dilated cardiomyopathy as in those with AF-induced heart failure (tachycardiomyopathy)? How much does left atrial contraction status impact the clinical results?

Additionally, catheter ablation for persistent AF is still evolving. Different strategies have been proposed to improve results, but there is still no clear benefit beyond that expected from antral pulmonary vein isolation. Could left atrial magnetic resonance imaging or echocardiographic assessment of LA function help select patients in whom ablation brings benefits?^{9,10} We still have a long way to go to better understand, select and manage these patients.¹¹

Conflicts of interest

The author has no conflicts of interest to declare.

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