



EDITORIAL COMMENT

Ablate and pace: The ultimate treatment for atrial fibrillation?

Pace e ablação: o tratamento derradeiro para a fibrilhação auricular?

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Available online 10 January 2022

Atrial fibrillation (AF) has become a major epidemic and is associated with increased morbidity and mortality.

Pacemaker treatment combined with atrioventricular junction (AVJ) ablation is an effective treatment in patients with atrial arrhythmias and symptoms due to high ventricular rate refractory to pharmacological treatment.¹

Another group that benefits from AVJ ablation are patients with heart failure (HF), AF and cardiac resynchronization therapy (CRT) with a low percentage of biventricular pacing. AVJ ablation has been shown to increase the percentage of biventricular pacing and thus increase the therapeutic effects of CRT.²

However, AVJ ablation is not without risks. Right ventricular pacing induces left ventricle dyssynchrony that in turn impairs cardiac function. There is also an increased risk of sudden death after AVJ ablation.³ On the other hand, the long-term performance of pacing devices is not flawless.⁴ Hence the pertinence of long-term results after use of the ablate and pace strategy.

The article by Manuel et al. in this issue of the Journal⁵ illustrates the retrospective experience of a Portuguese tertiary center and the longest follow-up ever published after AVJ ablation. The authors followed a very heterogeneous population of 123 patients who underwent AVJ ablation for a median period of 8.5 years (8.8-11.8). Most of the patients presented uncontrolled supraventricular tachycardia that resulted in HF, tachycardiomyopathy, implantable

cardioverter defibrillator (ICD) inappropriate shocks and other severe symptoms related to tachycardia. Ten (8%) patients were treated due to low biventricular pacing percentage.

The most common arrhythmia was AF (65%). All AVJ ablation procedures were successful without major complications. 13 (11%) patients had previous devices implanted and all the others were implanted at the time of AVJ ablation. At the end, device distribution was as follows: pacemaker (82%), CRT pacemaker (6%), CRT-defibrillator (8%) and ICD (4%). Unexpectedly, there were no device-related complications during this long follow-up.

They report an improvement in HF functional class, a reduction of hospitalizations and of unplanned emergency department visits due to HF. There were no differences in left ventricular ejection fraction (LVEF) and LV end-diastolic diameter before and after the procedure. The authors do not clarify the timeframe for these clinical and echocardiographic changes. For that reason, we are unable to gauge the magnitude and the pattern of the benefits.

At the end of the follow-up, mortality was 23%. There is no information regarding the causes of death.

Despite these gaps, this article reinforces the importance of AVJ ablation.

In a meta-analysis of randomized trials comparing the ablate and pace strategy with drug therapy, overall mortality at one year was 3.5% among the ablate and pace group,⁶ similar to the findings of Manuel et al.⁵ We need to keep in mind that no robust data support survival benefit after the ablate and pace strategy.

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<https://doi.org/10.1016/j.repc.2021.12.001>

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Clarification of the causes of death is of paramount importance. AVJ ablation is associated with a small (2%-4%) risk of sudden death.⁷ It is important to note that the vast majority of those who experienced sudden cardiac death had a significant number of risk factors, including reduced left ventricular function, advanced HF, and a history of ventricular arrhythmias.

Programming the pacemaker at a higher ventricular pacing rate (minimum of 90 bpm) for the first one to two months following ablation has been a way to mitigate the risk of proarrhythmic bradycardia. Sudden death can be due to proarrhythmic bradycardia but pacemaker dysfunction is another possible cause. With that concern in mind, many centers postpone AVJ ablation until pacemaker electronics are reassessed. Otherwise, a simultaneous procedure such as that used by Manuel et al.⁵ would be less burdensome. Vascular access for the ablation catheter could even be the same as the pacemaker. This article fails to clarify the important issue of the unreported causes of death.

The assessment of symptoms and ventricular function improvement and reduction in hospitalization and emergency department visits is a matter of debate. Most studies including the one by Manuel et al.⁵ included patients with and without reduced LVEF. We are able to predict that patients with reduced LVEF may improve due to tachycardiomyopathy reversibility or increased biventricular pacing percentage. On the other hand, patients without reduced LVEF could worsen because of pacing induced desynchrony. One mechanism could lead to an improvement in some patients and a worsening in others. The final outcome would be hard to predict.

In general, several retrospective studies, randomized control studies, and meta-analysis reported beneficial demonstrate that ablate and pace is a valuable palliative therapy for highly symptomatic, drug-refractory AF patients. Many retrospective studies have documented significant acute and long-term improvement in left ventricular function, symptoms, cardiac performance, exercise tolerance, clinical outcomes, and quality of life.

There were several randomized controlled trials comparing an ablate and pace strategy with medical therapy. Ablate and pace was effective at controlling symptoms and improving quality of life but showed no benefit regarding death and left ventricular function.

Some meta-analyses have reported improvements in symptomatic, drug-refractory AF patients. Wood et al.⁸ found that exercise duration, ejection fraction, quality of life, symptoms, and hospital admissions improved significantly. Chatterjee et al.⁹ found in their meta-analysis that in the therapeutic management of refractory AF, AVJ ablation was associated with improvement in symptoms and quality of life. In addition, patients with reduced LVEF demonstrated an improved echocardiographic outcome relative to medical therapy alone. However, there was no survival advantage. For the subgroup of patients with CRT and low pacing percentage, the benefit is beyond any doubt.¹⁰

The debate about the effect on left ventricular function and clinical outcomes of HF is ongoing. Indeed, the effect on left ventricular function and clinical outcomes of HF are not consistent in the literature.

Meanwhile, in order to avoid the deleterious effects of long-term right ventricular pacing on left ventricular function, biventricular pacing has been proposed as an alternative to right ventricular pacing. CRT significantly reduces hospitalizations for HF, and significantly improves functional capacity, and left ventricular function, volumes and diameter in comparison with right ventricular pacing.¹¹ The PAVE study¹² randomized 184 patients with a mean LVEF of 46% to biventricular pacing or right ventricular pacing post AVJ ablation. Both groups showed an improvement in the six minute walk distance compared with baseline. Of interest is that the two pacing modalities did not differ until six months after the procedure, when a small deterioration in the right ventricular pacing group resulted in a significant difference between the two groups. The right ventricular pacing group showed a significant fall in LVEF within six weeks, which persisted at six months. On the other hand, the LVEF in the biventricular pacing group did not change from baseline values. Patients with impaired LVEF at baseline who underwent biventricular pacing showed the greatest improvement. Furthermore, patients with class II or III HF who received biventricular pacing improved significantly more than those who received right ventricular pacing.

Therefore, the current guidelines recommend CRT in patients with AF and left ventricular dysfunction who are candidates for AVJ ablation with a IIa level of evidence B indication.¹³

Huang et al.¹⁴ demonstrated that permanent His bundle pacing is safe and stable in HF patients with AF who had narrow QRS and underwent AVJ ablation. They observed a significant improvement in functional class and echocardiographic LVEF, and reduction in the utilization of diuretics in HF therapeutic management. Current results make His bundle pacing an attractive pace modality before AVJ ablation preserving ventricular synchrony.

Patients with AVJ ablation become chronotropic incompetent. This condition may be corrected by rate-adaptive pacing. While rate-responsive pacing can help these patients to adapt during exercise, it can also elicit an excessive increment in heart rate with possible deleterious effects. Device programming must be meticulous.

A less radical alternative to AVJ ablation is AVJ modulation. Although the outcome is less predictable, it avoids the need for a pacemaker and can be thought as a step between drugs and AVJ ablation.¹⁵

Ablate and pace is a useful and easy therapy but should be regarded as a final resort. It makes patients dependent on pacemakers and thereafter prone to pacing induced desynchrony, pacemaker dysfunction and infection. Although the markers for a worse prognosis after ablate and pace are not completely clear, care must be taken when choosing the pacing device, particular in patients with impaired systolic function and HF. For these patients, a more physiologic pace modality such as biventricular pacing or His bundle pacing should be considered.

Conflicts of interest

The author has no conflicts of interest to declare.

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