Assessment of left ventricular pacing in patients with severe cardiac failure after atrioventricular node ablation and right ventricular pacing for permanent atrial fibrillation

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Introduction

In patients with functionally poorly tolerated permanent atrial fibrillation (AF) radiofrequency (RF) catheter ablation of the atrioventricular (AV) node is considered a potential treatment. However, the treatment is established in patients with haemodynamically deleterious AF despite optimal medical therapy. After this procedure, permanent ventricular pacing is mandatory with an electrode implanted in the right ventricular apex[1]. However, in some patients, restoration of a lower and regular ventricular rhythm does not improve symptoms of cardiac failure, and in some patients the haemodynamic status deteriorates[1–3]. Finally, in some others after a period of well-being symptoms of severe cardiac failure recur. In these cases, therapeutic options are very limited: modifications in medical treatment have usually already been shown to be ineffective. Cardiac transplantation is very restricted in patients older than 60 years due to the shortage of donor hearts and other options are unrealistic either because they are experimental or ineffective. Recently, left ventricular pacing has been shown to be effective in improving the functional status of patients with end-stage cardiac failure[4]. The aim of the present study was to evaluate the preliminary results of this procedure in patients with severe cardiac failure after AV node ablation for permanent AF.

Study Group

The study group consisted of four men (mean age 64·2 ± 3·5 years) treated by RF ablation of the AV node for haemodynamically poorly tolerated permanent AF. This procedure, performed 1 to 39 months before the study, was ineffective in one patient from the start, and after several months of improvement in the three others (mean 27 months, from 8 to 39 months). At the time of left ventricular transvenous lead implantation, all the patients were in stable (more than 1 month) cardiac failure, NYHA Class III (one patient) or IV (three patients) despite ‘optimal’ medical treatment, with a mean ejection fraction of 25% (from 17 to 40%). Dilated cardiomyopathy was the underlying cause of cardiac failure in three patients and ischaemic heart disease in the other. All had permanent AF which has proved to be resistant to cardioversion.

Results

A permanent left ventricular pacing lead was introduced into a tributary of the coronary sinus to pace the
epicardial aspect of this cavity. No serious side effects were observed during the follow-up period and no modifications were introduced either to the pharmacological treatment or into the pacing parameters which remained identical to those programmed during the right ventricular pacing period (VVIR).

At the end of follow-up, three patients improved their NYHA Class (from IV to III (one case), IV to II (one case) and III to II (one case)). The functional status of the last patient remained unchanged (class IV). Other results are summarized in Table 1. No statistical analysis has been performed in this small series of patients; it should be stressed, however, that there is a clear trend towards improvement in clinical parameters (see for example 6 min walk test) and echocardiographic data.

**Conclusion**

It is concluded from this preliminary study that left ventricular pacing offers new hope to patients who underwent RF ablation of the AV node for permanent and poorly tolerated AF and in whom symptoms of cardiac failure persisted or recurred. A larger study group and longer follow-up are needed to establish that left ventricular pacing could replace right ventricular apical pacing in this selected group of patients.

**References**


