Figure 1 Comparison of Kaplan–Meier analysis for freedom from death for any cause between the Gasparini et al.1 and the Khadjooi et al.2 studies. The figure is adapted from Gasparini et al.1 and Khadjooi et al.2. SR, sinus rhythm; AF, atrial fibrillation; AF-drugs, atrial fibrillation with preserved AV node conduction; AF-abl, atrial fibrillation group with ablated AV node.

patients. In fact, survival from death from any cause was found to be very similar between the two AF groups with preserved AV conduction (Figure 1, survival curve C, dashed red for Gasparini et al. vs. B, solid blue for Khadjooi). These two clinically similar groups, although coming from different clinical realities, presented identical long-term outcome. In this context, either there were little or no differences in the rate regularization features activated between these groups, or any differences did not translate into important effects on outcome. When the Kaplan–Meier survival curve of permanent AF patients treated with AVJ ablation (Figure 1, curve D, dotted green for Gasparini et al.) derived from our experience is compared with the two other curves of patients with preserved AVJ conduction (Figure 1, curve C, dashed red for Gasparini et al., and B, solid blue for Khadjooi et al.), the significant protective effects of AVJ ablation on all-cause mortality become striking. Even though yearly mortality rate for the AF population is not explicitly specified in the Khadjooi study (Figure 1, curve B, solid blue), the survival pattern of this group is superposed to that of our experience (Figure 1, curve C, dotted red) and therefore yearly mortality may be estimated to be around 14 per 100 patients-year compared with a significantly lower incidence (4.6 per 100 patients-year) of events in the ablated AF group (Figure 1, curve D, dotted green).

Paraphrasing the editorial article3 accompanying our previous article4 on this topic, indeed we all are ‘desperately seeking’ a randomized clinical trial of resynchronization therapy for patients with heart failure and atrial fibrillation. Such a trial should evaluate the AVJ ablation approach compared with combined use of medication and device rate-control features such as ventricular trigger mode. In the meantime, the current evidence (including the comparison of these survival curves) supports, in our view, the recourse to AVJ ablation to optimize resynchronization effect in this heart failure patient population.

References

How to assess the efficacy of catheter ablation of atrial fibrillation?

Catheter ablation is an expanding treatment for atrial fibrillation (AF). But, the real outcome in terms of AF burden in the middle–long term after catheter ablation is still under evaluation. Most of the studies report a success rate for paroxysmal AF (PAF) between 60 and 80%, even if recent observations showed that this procedure does not eliminate PAF in up to 56% of patients over an extended (>3 years) follow-up period, despite the use of two or three ablation procedures in two-thirds of them.

In their work, Steven et al.5 focused on AF burden after catheter ablation in a highly selected cohort of pacemaker and implantable cardioverter defibrillator carriers. The analysis of the atrial electrograms recorded by their devices was used as an index of success of AF ablation in terms of relapses either for persistent AF (PersAF) or PAF, using the following device settings: (i) arrhythmia duration: >30 s, (ii) atrial frequency: <330 ms, and (iii) atrial sensitivity: 0.5 mV. According to their evaluation, AF burden dropped remarkably both for patients with PAF and with PersAF after catheter ablation.

Anyway, some observations are needed: first of all, the electrogram–storage capabilities of devices are limited in terms of number/duration of arrhythmic episodes and some episodes may be lost between the follow-up visits. Secondly, according to Israel and Barold,6 since AF diagnosis needs a 12-lead ECG or multiple intracardiac recordings, device-detected atrial tachyarrhythmias should not be labelled AF even if device criteria are satisfied. Moreover, if we rely on the maximum detected atrial rate of >180 b.p.m., coupled with a high-atrial sensitivity (0.5 mV) (as used by Steven et al.), we could be in a condition in which AF, atrial flutter, or atrial/sinus tachycardia may overlap.

These remarks, in our opinion, are important in consideration of the possible clinical implication of Steven et al.’s paper.
Since AF is the most common sustained arrhythmia in the western world, showing an increasing incidence (primarily due to ageing of the population), it triggers a heavy financial burden for our health care systems, related to morbidity, hospitalizations, and mortality.

Since it has not yet been proved that catheter ablation’s outcomes are definitely superior to medical therapy in terms of hard end-points, and considering that economic advantages of catheter ablation with respect to medical therapy of AF emerge only after 5 years, it appears reasonable to restrict the candidates to AF ablation only to selected patients at higher chance of long-term maintenance of sinus rhythm. In view of these considerations, the definition of reliable indexes of successful catheter ablation of AF at long term remains to be assessed.

References

Cristian Martignani
Institute of Cardiology
University of Bologna
S. Orsola-Malpighi Hospital
Via Massarenti, 9
Bologna 40139
Italy
Tel: +39 05 134 9858
Fax: +39 05 134 4859
Email: cristian.martignani@gmail.com

Mauro Biffi
Institute of Cardiology
University of Bologna
S. Orsola-Malpighi Hospital
Via Massarenti, 9
Bologna 40139
Italy

Cinzia Valzania
Institute of Cardiology
University of Bologna
S. Orsola-Malpighi Hospital
Via Massarenti, 9
Bologna 40139
Italy

Matteo Bertini
Institute of Cardiology
University of Bologna
S. Orsola-Malpighi Hospital
Via Massarenti, 9
Bologna 40139
Italy

Giuseppe Boriani
Institute of Cardiology
University of Bologna
S. Orsola-Malpighi Hospital
Via Massarenti, 9
Bologna 40139
Italy

doi:10.1093/eurheartj/ehn301
Online publish-ahead-of-print 2 July 2008

How to assess the efficacy of catheter ablation of atrial fibrillation: reply

The reliability of rhythm monitoring in order to achieve consistent follow-up data in patients who underwent catheter ablation for atrial fibrillation (AF) is still not satisfying. Currently, Holter monitoring is widely used to evaluate the success rates after catheter ablation. Unfortunately, storage capacity of such ECG devices is limited and recording intervals cover only a small portion of the entire follow-up period. Very recently, new implantable loop-recorder devices have been introduced to validate catheter ablation success rates in those patients. Since all these devices lack the ability to obtain intracardiac electrograms, we sought to investigate the ‘real’ AF burden in our study using previously implanted dual-chamber devices.

In the current issue of this journal, Martignani et al. remarked on the accessibility of AF recurrence after catheter ablation stressing the limitation of even a continuous intracardiac Holter monitoring as it was performed by implanted dual-chamber devices with appropriate detection and storage algorithms.

Writing this letter, we are grateful having the opportunity to comment on some of those remarks: (i) loss of data during a follow-up, even if digital data are stored appropriately as it is assumingly performed by Holter ECGs, implantable loop recorders or dual-chamber devices can never be excluded even if it appears unlikely if data are properly obtained by specially trained physicians or technicians. (ii) We also absolutely agree that AF only can be appropriately diagnosed by either 12-lead surface ECG or intracardiac tracings; the latter can be provided by an atrial lead tracing obtained by the devices used in our study. Whenever intracardiac electrograms (EGMs) of atrial high-frequency episodes were available, they were manually reviewed in order to discern between atrial tachycardia and atrial fibrillation by A–A interval stability analysis. As mentioned in the limitation section of the paper, we cannot exclude that (iii) some of the episodes where no EGM was available and which were allocated to AF may also have been atrial tachycardias. Therefore, the recurrence rates of AF were potentially over-estimated in our manuscript. Especially, in patients with persistent AF, the occurrence of subsequent atrial arrhythmias other than AF is well known to be one of the first steps achieving lasting sinus rhythm in those patients. It is notable that these consecutive arrhythmias have favourable outcomes during a second or third procedure.

Despite there is no proof of (iv) cost-effectiveness of catheter ablation, the success rates in paroxysmal AF are >70%, thus pulmonary vein isolation has a class Ill indication (evidence level B) according to the recent guidelines. Nademanee et al.