Editorial

How to make sure complications are avoided after an otherwise safe procedure

The paper in this issue by Buys et al. is interesting\cite{1}. It was well written and addresses the important clinical issue of the timing and modalities of pacemaker implantation around the procedure of His bundle ablation (HBA). The authors use this clear descriptive term for what is generally called AV junctional ablation. This intervention, which is performed for persistent or paroxysmal atrial fibrillation, should result in complete heart block to make patients less symptomatic, and possibly to improve heart failure, when atrial fibrillation affects cardiac function. A year ago a ‘think-tank’ of cardiologists drew up guidelines on how to perform this procedure, and suggested what precautions needed to be taken to avoid pacemaker-related complications\cite{2}. This group suggested avoiding one particular setting: HBA, followed 24 h later by implantation, as this implied temporary and thus unreliable pacing.

The material providing data for this observational study by Buys et al.\cite{1} comes from the era before this publication, and from a centre with an outstanding reputation for cardiac pacing and cardiac electrophysiology in the Netherlands. Therefore, it is possible that real life in the Netherlands and in Europe may be worse than is reported here, even when interventions such as ablation are restricted to a limited number of centres, with the pacing procedure being carried out in the general hospital, as is reflected in the design of this study, and may be common practice in other countries than the Netherlands.

The background of this study, as outlined by this group, is that economic restrictions prohibit implantation of pacemakers by the centre performing the HBA, because device therapy is a too costly procedure for the ablating hospital (this is well known by the authors, who nevertheless produced a nice variant of ‘newspeak’ to hide this fact).

A general cardiologist, not involved in the daily decision process leading to HBA, may have many questions when reading this article. Indeed, not all logical questions are addressed, and I will try to answer a few, starting from some interesting points raised in this paper and in the related literature on this procedure.

What is an acceptable complication rate?

In the early days of radiofrequency ablation, surprisingly, a low figure of 3.2% complications was reported by a European survey. This total sum was composed of very small percentages, all below 0.5%, except for venous thrombosis, which accounted for 1%. Pacemaker-related problems were only noted in 0.22% of cases\cite{3}.

More recently, most authors focused on long-term effects, and forgot to report on the complications of the procedure\cite{4}. It is the merit of the authors that they again paid attention to the procedure itself, and it is reassuring to see that they have a very low complication rate, at least according to their definitions.

However, it is unclear what is meant with ‘haemodynamic deterioration’, as this can vary from a pause of 3 s or more, to profound hypotension, and become complicated by arrhythmias, ranging from ventricular premature beats via short-term torsades de pointes to ventricular fibrillation. This complication is not innocent (it happened in three patients), and the authors rightly conclude that this should be avoided at all costs. Further, they observed in 16% of the cases ‘secondary end-points’, or rather ‘problems’. This is disturbing, and occurred mainly in patients without an implanted pacemaker, surprisingly more often in the group treated in their own hospital (14/47 had malpacing or malsensing, vs 3/57 who were referred from others). This suggests that at least some bias is present (over- vs under-reporting). Further, it is not easy to explain why they do not see these problems in the patients who had a temporary pacemaker on top of an implanted one, which was standard procedure.

How to avoid pacemaker dysfunction, bleeding, thrombophlebitis and vascular problems?

Vascular access clearly remains a problem in this report, while a venous femoral puncture, to provide access for a single ablation catheter, should not be a
problem. This is different if a temporary pacemaker stays in place at that site for hours or days, as stability is bound to be problematic, while subclavian or jugular approaches should be safer from that point of view. Infection, which was not mentioned, is also less likely when using an approach via the upper half of the body. The suggestion is that this should be conducted by implanting the pacemaker long before the HBA procedure, and to allow complete healing, and lead fixation in the myocardium, which takes about a month. Nevertheless, some concern remained about interference of the radiofrequency current with normal pacemaker function[5]. This was not reported in this study.

How to avoid early ventricular arrhythmias and late sudden death?

It was noted that severe ventricular arrhythmias occurred in spite of correct sensing and pacing in about 4–6% of the patients in the days after ablation[6,7]. Torsades were thought to be the reason in some, but not in all, patients[6]. The mechanism leading to torsades (mainly in patients with fast conducted rates and concomitant cardiac pathology) has now been understood by basic scientists[8]. The observation that the arrhythmia was associated with a long QT syndrome led to advice to programme pacemakers at a faster rate than usual, at least in the first days after the procedure to suppress bradycardia-dependent mechanisms[7]. Whether late sudden death is also related to torsades is not clear, but it seems to happen in about 2% to 9%, confirming the early figure of 6-22% over 2 years[4,6].

It is striking that Buys et al.[11] did not report torsades, or late sudden death, in spite of the fact that all pacemakers were initially programmed to 50 beats . min⁻¹. One possibility is that the groups comprised ‘better patients’ than former groups, but Buys et al. indicated that the time to ablation was about 65 months, which makes this hypothesis not very likely. In our study, chronicity was a risk for late cardiac death, which is not unexpected. When we performed multivariate analysis on mortality after HBA in 107 patients, only high age and the presence of coronary artery disease played a role. It was not clear that early ventricular fibrillation predisposed to later sudden death, but a nice trend illustrated that ICDs were protecting those with previous ventricular tachycardia or fibrillation[6].

Why should we perform His bundle ablation before pacemaker implantation?

This is certainly not clear. At this moment, some evidence is being accumulated that it is possible to prevent atrial fibrillation with several forms of pacing[9]. Further, new pacing modalities seem to support cardiac function, which could be important for patients with heart failure, possibly preventing new bouts of atrial fibrillation. Pacing therapy should be attempted, and exhausted before an irreversible step notably HBA is undertaken.

L. JORDAENS
Co-Editor, Europace

References