

# Recent clinical developments in the treatment of atrial fibrillation

*(25th 'Wolfheze' Congress, 22 November 2003)*

This congress was chaired by Professor H.J.G.M. Crijns, Maastricht University Hospital.

In the first presentation Professor N.M. van Hemel (cardiologist, St. Antonius, Nieuwegein) discussed the current position in the 'Follow-Pace' study. In the Netherlands, >7000 new pacemakers are implanted a year in patients with an average age of 73 years and a rhythm or conduction disorder. The objective of this study is to determine which factors related to the patient or the pacemaker measured at implantation can predict the occurrence of pacemaker complications and the quality of life of the pacemaker wearer. Do periodic checkups have an added value for the prognosis and the quality of life of the pacemaker wearer?

The design of this study is unique, all data are sent by e-mail, and in just over four months nearly 300 of the intended 2500 subjects have been enrolled. The Alkmaar Medical Centre is in the leading position of the more than 20 participating centres.

The place of catheter ablation in the treatment of paroxysmal or persisting atrial fibrillation was the theme of the presentation by Dr A. Meyer, (cardiologist, Catharina Hospital, Eindhoven). The surgical Maze procedure has achieved a firm position in the treatment of serious symptomatic drug-induced refractory atrial fibrillation. This technique has undergone several adaptations over the last few years; these days

surgeons make linear lesions with radiofrequency (RF) and cryo energy, while the cardiologist catheter Maze technique has been more or less abandoned.

The discovery that more than 80% of atrial fibrillation is caused by atrial ectopics from one or more pulmonary veins resulted in a revolution in the non-pharmacological treatment of these rhythm disorders.

The results of pulmonary vein ablation are very encouraging; several centres have an acute success rate of nearly 70%, while after one year and sometimes a second attempt at RF ablation, more than 60% of the patients are free of atrial fibrillation. A related technique is the isolation of the pulmonary veins by drawing RF lines around the ostia of the pulmonary veins, well into the atrial tissue. Although there is more RF damage, a great advantage is that the risk of pulmonary vein stenosis, leading to pulmonary hypertension, is slight. In expert hands, this serious complication of the application of RF energy in the pulmonary veins is very rare indeed.

Dr C.J.H.J. Kirchof (cardiologist, Rijnland Hospital) spoke about the occurrence of atrial fibrillation in patients with an atrial or ventricular pacemaker. Results from the Canadian Trial of Physiology Pacing (CTOPP) and Mode Selection Trial in Sinus Node Dysfunction (MOST) studies show that patients who receive a pacemaker for the sick

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sinus syndrome or due to AV conduction disorders do better with a two-chamber pacemaker system. At three-years follow-up, the patients with a two-chamber system developed atrial fibrillation less frequently. In this respect, atrial stimulation (AAIR) is even more superior; previous and recent Danish studies show conclusively that loss of the intrinsic ventricular conduction is pro-arrhythmogenic regarding development of atrial fibrillation. So AAIR or DDDR with a long AV delay is the optimal pacemaker therapy in the sick sinus syndrome.

Various studies have investigated pacemaker techniques to prevent or interrupt atrial fibrillation. In these studies single-site atrial stimulation, dual-site biatrial, new preventive pacing algorithms and antitachy pacing techniques were investigated. Although some studies suggest some success, many more robust randomised studies are needed to determine in which patients a pacemaker would potentially be successful in the treatment of atrial fibrillation.

W. de Voogt, the main investigator of the Overdrive Atrial Septum Stimulation (OASES) trial, showed that AF suppression algorithms are indeed successful in suppressing paroxysmal atrial fibrillation, especially if, as in two-chamber stimulation, the atrial conductor is inserted low down in the intra-atrial septum. In this patient group with the AF suppression algorithm on, AF burden (the total time in atrium

fibrillation) fell by 72%, and in the patients with the conductor in the right atrium it fell by nearly 50%.

*Professor A. Schuchert (Eppendorf University Clinic, Hamburg)* stressed the importance of carefully choosing which preventive AF algorithm to use in which patient. In earlier studies, such as the **A**trial **T**herapy **E**fficacy and **S**afety Study **T**rial (ATTEST), **A**trial **S**eptal **L**ead **P**lacement and **A**trial **P**acing **A**lgorithms for **P**revention of **P**aroxysmal **A**trial **F**ibrillation (ASPECT) and **A**F **T**herapy, it appeared that if all the pacemaker algorithms were activated, then there was no significant reduction in the occurrence of atrial fibrillation. This could possibly have been caused by the proarrhythmic effect of some algorithms. This suggestion is especially based on the preliminary results of the VIP

registry and the speaker's own Hamburg 3:4 study. Both these studies show that algorithms offering continuous atrial pacing are less effective in the prevention of AF than algorithms that respond to AF triggers.

In his presentation on the lessons learned about the treatment of atrial fibrillation from the pacemaker trials and what can be expected in the future *Dr J.H. Ruiter, (Alkmaar Medical Centre)*, concluded: Previous studies were too different in design to allow good comparisons. The results proved to vary considerably and were influenced by qualitatively inadequate atrial sensing. Much has been learned, however, about the mechanism for the onset of atrial fibrillation.

In the future, on the basis of digital technique, a pacemaker will be able to automatically differentiate

between atrial flutter, atrial fibrillation, myopotentials, and far-field signals and itself deliver the therapy programmed by the pacemaker technician or cardiologist. With each treatment, the diagnosis and therapy with the accompanying intercardial ECG will be recorded in the pacemaker's arrhythmia logbook. It can be expected that in a few years time the pacemaker itself will be able to decide on the optimal therapy for the patient, so that pacemaker checkups can be greatly reduced in frequency and intensity. In Alkmaar Medical Centre, more than 2400 pacemaker checkups are undertaken a year; increased automation could perhaps halve this number. This means that pacemaker technicians will have more time for new or other activities. ■