History

Non-pharmacological treatment of cardiac arrhythmias in Estonia during the last decades

Rein Kolk
Department of Cardiology, Tartu University Hospital, Tartu, Estonia

Permanent cardiac pacing

1968 1st implantation of a permanent cardiac pacemaker in Estonia;
1975 1st implantation by an Estonian physician;
1977 transvenous lead, regular implantation of pacemakers in Tartu;
1982 paediatric implantation;
1987 atrial lead;
1994 rate-responsive and DDD-pacing, 2nd Pacing Center (Tallinn);
1997 AICD implantation;
2001 biventricular pacing.

The history of permanent cardiac pacing dates back to the sixties, when several highly symptomatic patients with bradycardia were transferred for treatment to Kaunas, the All-Union Center of Cardiac Arrhythmias. In 1968, our Lithuanian colleague Prof. Žebrauskas came to Tartu to implant a ventricular pacemaker in a 60-year-old male who presented with complete atrioventricular block and syncope. After 7 years, similar operation was carried out by Prof. Kliman (1920–1989), the founder of Estonian cardiac surgery (Figure 1). In 1977, permanent cardiac pacing was introduced on a regular basis at Tartu University Hospital by Assoc. Prof. Samarütel and Dr Aro, who implanted the vast majority of pacemakers during the next 15 years, followed by Dr Roose during the last decade. Since introducing the atrial lead, AAI pacing has been the mode of choice in patients with sick sinus syndrome. Not surprisingly, in appropriately chosen patients, on very rare occasions, the pacing system has had to be upgraded to DDD mode.

After the opening of the 2nd Pacing Centre at North-Estonian Regional Hospital in Tallinn in 1994 (Dr Voitk, Uuetoa, Laanoja, Rebane), the number of implanted devices started to increase rapidly reaching 451 primary implants per 1 million population in 2003 (Figure 2). The share of dual-chamber units has shown a quick rise during the last years accounting 56 per cent of all implants in 2003 (Figure 3). Luckily enough, we have not been considerably restricted in the number of implants during the years of economical transition.

In the mid-nineties, a limited number of units were implanted by Dr Allikmäe at Tallinn Central Hospital. Because of several not implanter dependent reasons, these activities soon ceased. However, in our experience, in a small country with short distances, such as Estonia, the 2 existing pacing centres meet the needs of the community. Due to the fact that permanent cardiac pacing has been performed or supervised only by experienced implanters throughout the history, the problem of infectious complications has been almost non-existent in Estonia.

At present, all modalities of cardiac pacing are available in both centres in Tartu and Tallinn. AICD implants are performed, though in rather limited amounts, as the reimbursement issues of these costly devices have not been solved yet.

Tachyarrhythmias

1981 non-invasive electrophysiologic study;
1984 Holter monitoring, invasive electrophysiologic study;
1987 antitachycardia pacing, DC ablation;
1991 late potentials;
1996 radiofrequency ablation;
1999 2nd Ablation Centre;
2001 paediatric radiofrequency ablation;
2003 Maze procedure during cardiac surgery;
2004 pulmonary vein radiofrequency ablation.

The era of contemporary diagnostics and treatment of tachyarrhythmias in Estonia started in the first half of the eighties, when Dr Gusak at Tartu University Hospital and Dr Kaik
and Vainu at the Estonian Institute of Cardiology, Tallinn, introduced first non-invasive tools followed by endocardial programmed electrical stimulation. Worth mentioning, we have found transesophageal pacing a very cost-effective and reliable non-invasive diagnostic tool in patients with re-entry tachycardias. Non-invasive electrophysiologic study has not lost its importance nowadays. DC ablations were carried out in Tartu, however, the numbers remained low. During the late eighties and early nineties a number of antitachycardia pacemakers were implanted in patients with re-entry tachycardias. Although rather simple, capable of overdrive pacing, these devices offered reasonable symptom relief to appropriately chosen patients with high compliance.

In 1989, a Unit of Cardiac Arrhythmias, that has developed into the department now, was opened at Tartu University Hospital (Dr Paju, Kolk). New perspectives in tachyarrhythmia treatment opened in 1996, when the first radiofrequency (RF) catheter ablation in Estonia was performed by Dr Kolk and Paju. Since 1999, RF ablations have been performed in the 2nd Ablation Centre at North-Estonian Regional Hospital in Tallinn. At present, arrhythmias are managed in the recently created specialised unit there (Dr Uuetoa, Voitk). The number of RF ablations in Estonia has reached 196 per 1 million population in 2003 (Figure 4).

There has been no advanced arrhythmia surgery in Estonia. However, Maze procedures utilizing radiofrequency energy are being performed in
conjunction with mitral valve replacement operations in patients with troublesome atrial fibrillation. Lately, transvenous pulmonary vein isolation has become available.

Likewise to permanent cardiac pacing, all major methods of non-invasive, as well as, invasive diagnostics and treatment of tachyarrhythmias are currently available in both arrhythmia centres in Tartu and Tallinn.

One doctoral (R. Kolk, University of Tartu, 1994) and two PhD thesis (J. Kaik, All-Union Cardiology Scientific Centre, Moscow, 1983 and V. Mahhotina, Kaunas Medical Institute, 1989) on cardiac arrhythmias have been commenced.