

Summaries of Articles

Implantable Cardioverter Defibrillators: 6 Years Clinical Experience

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Internal cardioverter defibrillator (ICD) implantation has become a standard therapy for lifethreatening arrhythmias. From October 1990 to April 1996 187 patients received 249 ICD systems in our department. The mean age was 57 ± 21 (range 13-89 years). In the earlier years only epicardial patches were available and thoracotomy was the standard approach in 21 patients, after this period endocardial leads and subcutaneous patches were clinically available and the transvenous approach was the first choice. Acute complications were non-lethal pulmonary complications (11.1 % after thoracotomy, 0.5 % after transvenous approach), sternal bleeding (1 patient), subcostal pocket hematoma (1 patient). Late complications were three endocardial lead failure, one pocket hematoma, one mediastinitis. From January 1992 biphasic shock wave system and SC wire array leads were clinically available. The mean monophasic defibrillation threshold was 20.3 ± 6.2 Joules and the mean biphasic shock threshold was 14.6 ± 3.1 ($p=0.03$). Results after a follow-up of 24 ± 18 months; patients who experienced appropriate shocks were 46 %.

This study demonstrates that thoracotomy lead systems can be implanted with a high success rate and with an acceptable incidence of complications.

Relation of Exercise-induced ST-Segment Elevation to Myocardial Viability in Recent Q-Wave Myocardial Infarction

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Detection of viable myocardium in the infarct zone is clinically important for identifying patients who will benefit from revascularization. To determine whether exercise-induced ST segment elevation in Q-wave myocardial infarction (MI) can be used as a simple method for viability assessment, we studied 30 patients with a first recent Q wave MI and with

almost isoelectric (<1.0 mm elevated) STsegment on the resting electrocardiogram. Viability was determined by exercise T1-201 Single Photon Emission Computerized Tomography (SPECT) 9 ± 2 weeks after MI.T1-201 reinjection protocol was used in patients who showed no redistribution on standard 3-hour images (persistent defect). Regional wall motion on ventriculography was graded semiquantitatively on a 7-segment model (normal=0;dyskinetic=3).

Patients were divided into two groups according to the presence (group 1, $n=16$) or absence (group 2, $n=14$) of exercise-induced ST elevation. Viability was detected in all 16 patients in group 1 and in only 8 (57%) patients in group 2 ($p<0.01$). There was no significant difference in the extent of underlying coronary artery disease between the two groups. Retrograde filling by collateral flow to the infarct-related artery was significantly better in group 1 compared to group 2 ($p<0.02$). Although wall motion abnormality score was significantly higher in group 1 compared to group 2 (4.6 ± 1.8 vs. 3.1 ± 1.2 , $p<0.02$), no patient had left ventricular aneurysm. These results suggest that even if segmental wall motion is severely abnormal, exercise-induced ST elevation in recent Q wave MI is related to myocardial viability.

Direct PTCA in Acute Myocardial Infarction

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We evaluated 130 patients with signs of AMI who presented within 6 hours after the onset of symptoms, or between the 5th and 12th hours if there was evidence of ongoing ischemia. Enrollment began on September 1994 and ended August 1996. Patients were immediately transported to the catheter laboratory and underwent coronary angiography followed by direct PTCA if indicated. Mean patient age was 55 ± 10 , 87% of patients were male, 12% had prior MI, 54% had anterior MI and 87% were in Killip class I or II. Five patients had spontaneous reperfusion and were treated medically. Thirteen patients with extensive CAD and 1 patient with LMCA lesion underwent primary CABG. Nine patients with small, distal infarct-related artery (IRA) occlusion

were treated medically. One-hundred patients were assigned to undergo direct PTCA. The success rate was 91%. Time from admission to the first balloon inflation was 47 ± 21 min. In 9 patients PTCA failed; 6 underwent CABG, 3 patients were treated medically. Follow-up angiography was performed in all PTCA patients before hospital discharge. Reocclusion of the IRA during hospitalization was seen in 6 patients (symptomatic in 3). One patient died after successful PTCA, overall mortality was 5.5% in all patients. These results suggest that direct PTCA is an effective method for establishing early and optimal blood flow through the IRA, with an acceptable mortality and lower complication rate.

Myocardial Injury Resulting from Radiofrequency Catheter Ablation by Analysis of Troponin-T and Other Cardiac Enzymes

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Although radiofrequency catheter ablation (RFA) has been used to eliminate tachyarrhythmias as a successful and safe method, there is no study that is demonstrating RFA induced tissue damage by using serum troponin-T (TnT). The aim of this study is to investigate myocardial injury resulting from RFA by analyzing TnT and other cardiac enzymes. The study population consisted of 22 (9 women and 13 men; mean age: 33.8 ± 16.4 years) patients (pts) with symptomatic supraventricular or ventricular tachyarrhythmias and 23 healthy persons (3 women and 20 men; mean age: 29.1 ± 8.4 years) as a control group. There was WPW syndrome in 19 pts, automatic atrial tachycardia (AAT) in 2 pts and ventricular tachycardia (VT) in 1 pt. Twenty-nine RFA sessions were performed in 22 pts. Blood samples were taken before and after (6th, 16th hour and 4th day) the procedure from each pt. Complete cure was obtained in 16 of 19 pts (84%) with WPW syndrome. RFA was also successful in 2 pts with EAT and 1 pt with VT. Transient and mild complications occurred in 3 sessions. There was no difference between the mean basal TnT values of pts and the control group (0.01 ± 0.01 ng/ml and 0.01 ± 0.02 ng/ml respectively). The serum TnT level was increased above to normal

values in 27 of 29 procedures (93%) at the 6th hour (TnT-6); in 24 procedures (83%) at the 16th hour and in 8 procedures (27%) at the 4th day. Thus, in determining RFA tissue injury, sensitivity of and in 8 procedures (27%) at the 4th day. Thus, in determining RFA tissue injury, sensitivity of TnT was 93% and specificity was 100%. At 6th hour, 16th hour and 4th day of RFA, rates of increase above normal values of CK and CKMB were 34% and 41%; 28% and 28%; 3 and 3%, respectively. Therefore, the incidence of elevated TnT levels were significantly higher than CK and CKMB ($p<0.0001$, $p<0.0001$ and $p<0.001$ for 6th, 16th hour and 4th day, respectively). There was positive correlation between the serum TnT-6 level and the number of RF pulses ($r:0.63$), total pulse duration ($r: 0.62$), total energy ($r: 0.65$) and total power ($r: 0.66$), but there was no significant correlation between the levels of CK or CKMB and these parameters. The mean TnT values in subgroups comprising number of pulses >20 , total pulse duration >500 second, total energy >12000 joule and total power >600 Watt were significantly higher than subgroups comprising the mean values less than these limits. The mean CK and CK MB values were not significantly different in these subgroups. There was no relation between enzyme levels and the rate of success or complications.

It was concluded that TnT analysis is a very sensitive method in determining of degree of myocardial damage resulting from RFA, whereas CK and CKMB are less reliable.

Comparison of Temperature-Controlled and Power-Controlled Catheters for Radiofrequency Catheter Ablation in Patients with WPW Syndrome

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The aim of this study was to evaluate whether there is any advantage to use temperature-controlled catheters (Blazer T or Mariner) over the conventional catheter system (Polaris or Blazer) which can control power only. The study material consisted of 73 patients (25 females, 48 males; mean age 35.8 ± 12.9 years; range 5-69 year) with WPW syndrome. The radiofrequency equipment (Radionics, EPT or Atakr

generator) operated in the power control (PC) mode in 24 procedures in 21 patients and in the temperature control (TC) mode in 62 procedures in 52 patients. The mean age (34.8 ± 12.2 vs 35.6 ± 13.2 years, respectively), ratio of male to female patients (12/9 vs 36/16, respectively) and localizations of accessory pathways were not statistically different in the PC and IC groups. Number of applications (12.6 ± 9.7 and 15.6 ± 10.3 , respectively), total duration of applications (363.9 ± 330 sec and 438.2 ± 407.7 sec, respectively), total energy (14313 ± 10470 Joule and 14474 ± 12633 Joule, respectively) and number of impedance rise (0.7 ± 0.9 and 0.4 ± 1.5 , respectively) were not significantly different in the groups of PC and TC. Duration of ablation (97.0 ± 71.6 min and 139.2 ± 96.8 min, respectively, $p < 0.05$) and fluoroscopy time (30.0 ± 20.2 min and 40.0 ± 14.1 min, respectively, $p < 0.05$) in TC group were significantly less than those of PC group. There was no statistically difference on the rates of success (71% vs 79%, respectively), complication (12% vs 6%, respectively) and recurrence (4% vs 8%, respectively) in the PC and TC. In according to patient basis, the overall rate of success was 90.4% (66/73), complication rate 10% (7/73) and recurrence rate 8% (6/73).

We concluded that although there was a slight tendency, the use of temperature-controlled catheters did not improve the efficacy and safety of RFA procedures, but it reduced the duration of RFA and fluoroscopy.

Complications Resulting from Radiofrequency Catheter Ablation in Patients with Supraventricular and Ventricular Tachyarrhythmias by Serial Echocardiographic Examinations

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The aim of this study was to evaluate the complications following radiofrequency catheter ablation (RFA) in patients with supraventricular or ventricular tachyarrhythmias. The study material was consisted of 125 (80 males, 45 females; the mean age was 37.5 ± 14 years; age range 3.5-69 years) patients. It

was applied that 84 ablations of accessory pathway in 75 patients with preexcitation syndrome, slow pathway ablation in 21 patients with atrioventricular nodal reentrant tachycardia, focus ablation in 7 patients with ectopic atrial tachycardia, linear ablation in 1 patient with atrial flutter, modification of slow pathway in 1 patient with atrial fibrillation, ablation of His bundle in 3 patients with atrial fibrillo-flutter, and focus ablation - or right bundle ablation- in 17 patients with ventricular tachycardia. The acute anatomic and valvular consequences of radiofrequency ablation were evaluated by means of serial (before and 1, 3, 7 days after the procedure) echocardiographic investigations. Semiquantative assessment of valvular incompetence and classification into one of four grades according to the width and extensions of the jet from the valvular orifice were carried out. Segmental wall motion abnormalities were evaluated semiquantitatively with four grades of severity (normal, hypokinesia, akinesia or dyskinesia). Before the procedure, various echocardiographic abnormalities (mitral valve prolapsus in 16, segmental wall motion abnormality in 7, rheumatic valve disease in 5, dilated cardiomyopathy in 8, hypertrophic cardiomyopathy in 2, arrhythmogenic right ventricular dysplasia in 2, Ebstein abnormality in 1, patent foramen ovale in 3, atrial septal aneurysm in 1, other valvular abnormalities in 5, Eustachian valve in 1 and hypertensive heart disease and left ventricular hypertrophy in 2) were established in 50 (% 40) patients. Subepicardial fat simulating pericardial effusion was observed in 5 patients. New echocardiographic abnormalities were observed in 5 (4 %) patients, medium (<1 cm) pericardial effusion in 2 patients, mild aortic incompetence in 1 patient, increase in severity of tricuspid incompetence in 1 patient and left ventricular thrombus in 1 patient one day after radiofrequency ablation. Segmental wall motion abnormality related to the procedure was not detected. No any other abnormality was detected after the first echocardiographic investigation following ablation.

We concluded that these findings confirm the safety of the radiofrequency catheter ablation in the treatment of patients with supraventricular and ventricular tachyarrhythmias, and more than one echocardiographic examination after RFA is unnecessary in all patients.

Echocardiographic Parameters in the Assessment of Diastolic Function

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The evaluation of diastolic functions of the heart is significant in the diagnosis and treatment of heart diseases. Doppler echocardiography is the most commonly used method for this purpose. The parameters that can be detected by Doppler echocardiography and most commonly employed for evaluation are the ratio of mitral peak flow velocity in early diastole to peak flow velocity in late diastole (E/A ratio), deceleration time of early diastole and isovolumic relaxation time. The detection of these parameters, although having some restrictions, provide important information for the evaluation of the diastolic function of the left ventricle.

In this review, in addition to echocardiographic parameters used for the evaluation of the diastolic function of the left ventricle and the factors influencing these, the new echocardiographic methods are surveyed with reference to the literature.

Radiofrequency Catheter Ablation Treatment of Typical Atrial Flutter with Anatomical Approach: Case Report

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Electrophysiologic study (EPS) was performed in a 47-year-old woman who had atrial flutter resistant to medical therapy with high ventricular rate. Coun-

terclockwise activation around the tricuspid annulus has been demonstrated and the diagnosis of typical atrial flutter was confirmed with EPS. With the anatomical approach, a line of block was created by placing ablation lesions in a line at the isthmus between inferior vena cava and tricuspid annulus and the atrial flutter terminated. After ablation, atrial flutter was no longer inducible by atrial programmed stimulation and burst pacing. Two months after the ablation, the patient was asymptomatic and her surface ECG was in sinus rhythm. Atrial flutter could not be detected with Holter monitoring.

A Case of Pulmonary Embolism after Acute Myocardial Infarction

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Pulmonary embolism (PE) is a rare but fatal complication of acute myocardial infarction (AMI). Just like in the case of pulmonary embolism due to other causes, thrombolytic therapy is the most efficient treatment method in these patients. Here we present a case of pulmonary embolism that occurred after AMI. The clinical and echocardiographical findings had aroused the clinical suspicion of pulmonary embolism and the exact diagnosis was confirmed by the ventilation - perfusion scintigraphy. After thrombolytic therapy, significant improvement was observed in the clinical and ventilation perfusion scintigraphy findings of the patient. By virtue of this case we emphasise that thrombolytic therapy is the most efficient contemporary treatment of pulmonary embolism.