Summaries of Articles

Impact of AV Sequential Pacemakers on Cardiac Hemodynamics

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AV sequential cardiac pacemakers, still being used as most physiological approach on purpose, may have inadvertent effects on cardiac mechanics, mainly causing asynchronous contraction and relaxation (asnchrony). To scrutinize the issue, 15 elective coronary angiography subjects of whom 5 were deprived of any cardiac disorder that might induce asynchrony, and 10 were chronic coronary patients without prior myocardial infarction, were enrolled into the study.

Methods: Asynchrony was assessed on contrast left ventriculograms taken twice in 30° RAO with 50 f/sec speed and simultaneous pressure recordings, as pacing the right heart in AOO mode first (spontaneous asynchrony), and in DOO mode of same rate and possible longest AV delay next (pacemaker induced asnchrony). During a cardiac cycle, figures of each frames were divided in 8 segments by long axid and 3 semi-axes. The sum of discrepancy areas between global and 8 regional volume-time (v-t) curves, after being normalized by stroke volume and cycle length, was calculated as asnchrony index (AI), and standard deviation of times to minimal volumes of 8 segments was found as temporal asnchrony index (AIt). Diastolic filling was evaluated by atrial filling fraction (AFF), peak early filling rate (PEFR) which were derived from global v-t curves and pressure at mitral opening (Pmo), while the possible impact of intrinsic factors on asnchrony was appraised with chamber stiffness (a) and elasticity constant (k) which were obtained from volume,pressure curves. Left ventricular maximal systolic and end-diastolic pressures and volumes, dP/dt max and dP/dt min, TAU were measured as hemodynamical parameters. Pacing rates were similar between groups. DOO pacing changed none of the aforementioned values significantly in healthy group. In coronary patients, AFF increased and PEFR decreased significantly with DOO pacing ($p<05$, $<.04$, respectively). Although AI, AIt and a, k were higher compared to control group at AOO pacing, only the formers and TAU elevated significantly during DOO pacing ($p<05$). Moreover, changes of diastolic filling parameters had a strong correlation with only Pmo and AI (AFF-Pmo: $r=.72$, $p<.03$, PEFR-Pmo: $r=.68$, $p<.05$, AI-AFF: $r=.94$, $p<.001$). Multiple regression analysis of determinants (AI, Pmo, TAU, a) indicated that AI changes had correlated only with those of TAU in each group (Control group: AI-TAU: $r=.94$, $p<.01$, coronary group: AI-TAU: $r=.78$, $p<0.2$)

So it is concluded that A-V sequential pacemakers may induce significant asynchrony which may have a detrimental effect primarily on relaxation and early diastolic filling. Spontaneous asynchrony, however, determines to what extent this will occur.

Efficacy and Safety of Perfusion Balloon Catheter Use as Initial Balloon in Coronary Angioplasty

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In this study, we investigated the balloon angioplasty-related procedural success and complications in patients in whom perfusion balloon catheter (PBC) with low-profile has been used as the initial balloon catheter. The study population included 30 PBC patients (average age 53.8 ± 10.37 years). Twenty-four patients (80%) had unstable angagina. The vessels dilated were LAD in 47%, RCA in 50% and LCX in 3%. The mean % diameter stenosis was 92±7.36%. Lesion morphology was: Type A 13%; Type B1 17%; Type B2 60%; Type C 10%. 73% of the lesions were thrombotic. The mean total inflation time was 13.58±7.19 min, total number of inflation was 2.87±1.25, mean and maximum pressures applied, respectively, were 5.16±0.88 and 5.92±1.33 atm. Angiographic success rate was found to be 97%. Except 1 acute myocardial infarction (3%), there was no other major cardiac event (death or emergency coronary artery bypass surgery). Two dissections (7%) and 2 side branch occlusions (7%) were encountered.

In conclusion, when the cost of other stratejies such as stenting, directional or rotational coronary atherectomy and transluminal extraction catheter technology are also taken into account, the use of the PBC as the initial one in dilating high risk lesions (more irregular, stenotic and/or thrombotic) seems safe and efficacious.

Acute and Long-Term Results of Intracoronary Stent Implantation Without Conventional Anticoagulation

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The implantation of stent is coronary arteries has been shown to reduce both acute complications and restenosis rate. However, clinical use of intracoronary stents increases the risk of subacute stent thrombosis and hemorrhagic complications associated with the anticoagulant regimen. To reduce these complications, the hypothesis that systemic anticoagulation is not necessary when adequate stent expansion is achieved by high pressure balloon dilatation and also when ticlopidine and aspirine antiplatelet regimen is used after stent implantation was prospectively evaluated on a consecutive series of patients who were performed intracoronary stents. From December 1994 to October 1996, 284 patients underwent intracoronary stent implantation. Stent delivery was successful in all patients, and the procedural success rate was 99.3%. Event-free outcome at 1-month was achieved in 277 (97.2%) patients. Major cardiac events were subacute thrombosis in 2 patients (0.7%), including death in 2 (0.7%), acute myocardial infarction in 3 (1.0%). Vascular complications that required transfusion, surgical repair, or both occurred in 8 (2.8%) patients. At 7-month clinical follow-up of 195 of 284 patients, there was a 0.5% incidence of death, a 1.0% incidence of myocardial infarction, a 5% rate of coronary bypass surgery, and a 11% rate of repeat angioplasty for symptomatic restenosis.

These results suggest that adequate stent expansion with the use of high pressure balloon dilatations and the use of poststenting ticlopidine/aspirine antiplatelet treatment can significantly reduce the rates of subacute stent thrombosis and vascular complications. Seven months clinical follow-up data show that placement of an intracoronary stent results in a reduced requirement for repeat revascularization.

The Simultaneous Assessment of Stress Myocardial Perfusion, Regional Function and Myocardial Viability with Gated Technetium-99m Sestamibi Spect

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It is possible to evaluate stress perfusion and rest function at the same time with gated technetium-99m sestamibi single-photon emission computed tomography (SPECT) acquisition during stress-injected sestaMIBI. The aim of this study was first to compare single injection, single acquisition stress perfusion/rest function Tc-99m sestaMIBI-gated SPECT protocol with echocadiography for the evaluation of left ventricular wall motion and thickening and secondly, to evaluate whether this protocol is an alternative valid method to the conventional separate stress and rest myocardial perfusion SPECT studies for assessment of perfusion defect type and viability. 29 randomized cases were included in the study. Rest Tl-201/stress Tc-99m sestaMIBI dual-isotope myocardial perfusion SPECT protocol was performed as a classical stress/rest SPECT study. SestaMIBI-gated SPECT studies were evaluated for stress perfusion, rest wall motion and thickening. There was good segmental score agreement between gated SPECT and echocardiography for wall motion (74%, kappa=0.44, $p<0.001$) and thickening (73%, kappa=0.43, $p<0.001$). In 15 cases without previous myocardial infarction, excellent agreement (98%, kappa=0.98, $p<0.0001$) had been found for reversibility between stress sestaMIBI-gated SPECT and dual-isotope myocardial perfusion SPECT. However, in 14 cases with previous infarction, the agreement for reversibility between two methods was not as high compared with the cases without previous myocardial infarctions (%88, kappa=0.80, $p<0.01$). The results of our study confirm the investigations assuming that sestaMIBI-gated SPECT protocol can replace the classical stress/rest studies. Especially, in cases without previous myocardial infarction, stress sestaMIBI-gated SPECT procedure can be an alternative method for conventional stress/rest myocardial perfusion studies. In such cases, a separate rest perfusion study might not be necessary, resulting in shorter total study time, having gamma camera imaging time and decreasing radiation dose to the patients. If there are nonreversible defects or suspect of attenuation artifacts, rest Tl-201 perfusion study must be added.

Effect of Exercise and Dobutamine Stress Test on QT Dispersion in Patients with Coronary Heart Disease

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Interderivational QT variability on 12-lead electrocardiography (ECG) is defined as QT dispersion (QTd), and it is accepted that this dispersion reflects regional variability of ventricular repolarization. In the present study symptom-limited maximal treadmill exercise testing and dobutamine stress echocardiography (DSE) (maximum 40g/kg/min) were performed in 28 cases in whom major coronary artery stenosis of more than 50% was established by coronary angiography. In cases with or without myocardial ischemia the relationship between QTd was investigated.

While the difference between QTd which was measured at rest and peak exercise in cases who had ischemia during exercise test was significant ($p<0.05$), no significant difference was observed in cases without ischemia. Moreover, a significant difference was established between QTd before and during maximum dobutamine infusion in cases with ischemia during DSE, whereas there was no significant difference in cases without ischemia.

Hence, in stress tests performed by pharmacological and nonpharmacological agents, QTd values increased in patients with ischemia but there was not any significant difference between the methods used.

Is Left Atrial Spontaneous Echo Contrast Transforming to Thrombus in Patients Who Have Rheumatic Mitral Disease? A Prospective Study

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We aimed to investigate in a prospective manner the association of left atrial spontaneous echo contrast and thrombus determined in many cross-sectional and retrospective studies. Of the 113 cases with rheumatic mitral and/or aortic valve disease, 42 cases in whom spontaneous echo contrast was detected were included in the study after a clinical (electrocardiography, history, physical examination) and laboratory assessment for inclusion and exclusion criteria. Patients were randomly divided into two groups of 21 patients each, one placed on anticoagulants and the other serving as control group. Patients were clinically followed-up regularly at certain periods, and re-assessed 6 months later for spontaneous echo contrast and thrombus using transesophageal echocardiography. Thirty patients completed the study. The two study groups were not different from each other in terms of the parameters studied. Thrombus developed in 9 patients (30 %) at the end of the follow-up period. There was a significant difference between the thrombus and non-thrombus groups in terms of the use of anticoagulants, the presence of mitral regurgitation and density of spontaneous echo contrast ($p<0.05$). Logistic regression analysis showed that the only independent predictor of left atrial thrombus formation was spontaneous echo contrast ($p<0.05$, $r=0.351$). The relative risk of the absence of mitral regurgitation and dense spontaneous echo contrast for development of thrombus were 3.4 and 5.5, respectively,i n comparison with 1.65-folds increase caused by the use of anticoagulant ($p<0.05$). In conclusion, thrombus may develop in cases with rheumatic mitral stenosis, in the presence of left atrial spontaneous echo contrast, particularly in the absence of mitral regurgitation, while the use of anticoagulants has a preventive effect on this process.

Ventricular Septal Aneurysm Formation in Perimembranous Ventricular Septal Defect: Longitudinal Echocardiographic Results in 188 Patients

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188 Patients with perimembranous (PM) VSD were followed up from a median age of 0.33 (10 to 90. percentile: 0.08 to 3.80 years) for 5.40±5.65 years (median 2.42). Ventricular septal aneurysmal (VSA) transformation was observed in 105 patients (% 55.85) who were followed up for a mean of 4.94 years (80% between 0.33 and 13.33 years). The range of age at which VSA was first observed in the Eko-KG was between 3 days and 22.75 years (median 1.50; and in 80% between 0.15-11.83). The average incidence of VSA transformation for each age group was 32%. While the mean actuarial probability of formation of VSA in PM defects calculated by the Kaplan-Meier product method was 38% before age one, this increased to %100 during adolescence. The 95% confidence limits after age 14 was between 75 and 100%.

The incidence of spontaneous closure of the defect during the first 6 months after the VSA transformation was 8.33%, and this increased to 41% after 2-3 years and to 50% in those with longer duration than 4 years (95% confidence limits of the latter were between 31 and 69%). Besides the closure, there was a significant decrease in the diameter of the defect after the VSA transformation, i.e., the mean decrease

was 1.84 mm in the year after the VSA was observed, 2.53 mm after 1-3 years, 4.30 mm in more than 3 years, while the decrease in diameter was insignificant in the group without VSA. Regression equations presented showed a yearly decrease of 0.6 mm in diameter of the defect in the group with VSA ($p<0.001$) while the trend was insignificant in those without VSA. A subaortic fibrous ridge was observed in only one patient, and LV to RA shunt in 4 (%3.81), but these were hemodynamically insignificant.

Lymphocyte Subsets and Plasma Interleukin Concentrations in Children With Acute Rheumatic Fever

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Plasma interleukin (IL-2) and T-cell subpopulations were evaluated in children with acute rheumatic fever (RF). Three groups were included: 19 patients with active RF, 24 with non-active RF, and 30 controls. Among the 43 patients with RF 30 had rheumatic heart disease. T-cell subsets were measured via indirect immune fluorescence method by using monoclonal antibodies. IL-2 were measured by the ELİSA method.

The percentages of CD3+ and CD8+ cells of active and non-active RF cases were found to be decreased, the ratio of CD4: CD8 cells was found to be significantly increased. There was no increase in IL-2 concentration in active and non-active RF cases. Furthermore, no significant differences were found in T-cell subgroups with or without cardiac involvement.

In conclusion, we observed a decrease in CD3+ and CD8 + cell levels both in active and non-active periods. It is likely that longitudinal follow-up of RF patients for CD3+ and CD8+ levels gives more satisfactory information about this disease.

Cardiovascular and Clinical Findings in Children with Williams Syndrome

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Williams syndrome is a hereditary, progressive multi-system disorder characterized by "elfin facies", outgoing and talkative behaviour and frequent cardiovascular disorders especially in the form of supravalvular aortic stenosis (SVAS) and peripheral pulmonary stenosis (PPS). Genetic studies have demonstrated that deletion of the elastin gene localized at 7q11.23 plays a very important pathogenetic role in this syndrome. Literature knowledge points to the fact that SVAS may be progressive over the years whereas PPS generally has a better prognosis. In this investigation, 14 children with Williams syndrome have been studied with special attention to the cardiovascular anomalies and some clinical features (age at diagnosis ranging between 1.5 months to 12 years) and followed up for an average duration of 3.7±2.40 years. Two children had isolated SVAS, five had isolated PPS, another five had combined SVAS + PPS, one child had tetralogy of Fallot (associated with PPS and single coronary ostium) and a last child had severe aortic coarctation (associated with non-stenosing parachute mitral valve, mild SVAS and dilatation of the left coronary artery). One child with pulmonary valvular stenosis was lost to follow-up, one child with SVAS+aortic hypoplasia + PPS died during catheterization, and three children were operated (Fallot, coarctation and PPS+valvular PS) with good results. In the remaining cases, SVAS showed a moderate increase in two, a mild decrease in three, remained stable in two patients whereas PPS decreased in two, mildly increased in two and remained stable in another two. The observation that PPS increased in two and SVAS decreased in three cases was worthy of attention since it is contrary to what is generally expected during the natural course of these lesions. We believe longer follow-up periods encompassing greater numbers of children afflicted with this interesting syndrome will be of benefit in assessing its natural course.