

Summaries of Articles

Clinical Investigations

Treatment of Cardiac Arrhythmias by Radiofrequency Catheter Ablation

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We applied radiofrequency (RF) catheter ablation in 79 patients with various forms of tachycardia refractory to medical therapy in our clinic. Of these patients, 41 had atrioventricular (AV) reentrant tachycardia involving an AV accessory pathway, 18 had AV nodal reentrant tachycardia (AVNRT), 8 had atrial fibrillation (AF), 3 had atrial tachycardia and 9 had ventricular tachycardia (VT). In patients with AF, AV node ablation was achieved by 100 % success rate using right, and when necessary left sided approaches. Atrioventricular conduction reappeared in 1 patient but was successfully reablated in the second session. Among 18 cases with AVNRT, slow pathway ablation was tried in 17 and fast pathway ablation in the remaining one. Two additional cases underwent fast pathway ablation after early recurrence of an unsuccessful slow pathway ablation. The procedure was successful in 16 patients (88 %) and complete AV block was intentionally created in one case (5 %) after unsuccessful attempts at node modification. Of the 41 patients with accessory pathways, the pathway was located at the left free wall in 14, posteroseptal wall in 26 and right free wall in 1. The accessory pathway was concealed in 7 (50 %) of those with left free wall localization and in 2 (8 %) of those with posteroseptal localization. Thirteen (93%) of accessory pathways with left free wall localization and 20 (77%) of those with posteroseptal localization were successfully ablated. No recurrence was detected in patients with overt preexcitation. In only one case with a concealed accessory pathway, attacks of tachycardia reappeared after RF ablation. Two of 3 cases with atrial tachycardia of right atrial origin (67%) were successfully ablated. The origin of VT was right ventricular outflow tract in 2 and the left ventricle in 1 of 3 cases with idiopathic VT, and RF ablation was successful (100%) in all 3. All 6 patients with VT and structural heart disease, the tachycardia originated from the left ventricle. In 3 of these (50%), the clinical VT disappeared after RF ablation. No recurrence was noted in patients with atrial and ventricular tachycardia after an initial successful ablation.

Thrombophlebitis in 2, arterial thrombosis in 1, complete AV block in 1 and inappropriate sinus tachycardia in 2 patients occurred as complications. The ablation procedure took a mean of 2.8 ± 1.4 hours in the whole population of patients. The maximal procedural length was 6 hours in two patients, one with an accessory pathway and another one with VT.

In conclusion, we successfully treated various supraventricular tachycardias and idiopathic ventricular tachycardias, but did not achieve the same high success rate in the treatment of ventricular tachycardias accompanying coronary artery disease with this technique. We believe the procedure is a safe one with quite a low complication rate.

Effect of Adenosine in Termination of Induced Supraventricular Tachycardias and Comparison With Verapamil

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The effects of intravenous (IV) adenosine and verapamil in termination of supraventricular tachycardias (SVT) were compared in 22 patients (total 47 episode) undergoing an electrophysiologic study. Among these patients in whom SVT was induced by programmed electrical stimulation, 10 patients had AV nodal reentrant tachycardia, 9 had overt WPW and 3 had concealed accessory pathways. Adenosine, given at a dose of 6 mg led to conversion in 19 (86%) patients while in the other 3 patients 12 mg adenosine was required. Two of these 3 converted to sinus rhythm. Conversion to sinus rhythm occurred in 21 patients (96%) treated with adenosine, and in 14 (64%) patients treated with 10 mg IV verapamil ($p < 0.001$). The mean time for conversion was 35.9 ± 8.9 seconds for adenosine and 114.6 ± 48.7 seconds for verapamil ($p < 0.001$). Transient and well-tolerated side effects, flushing, dyspnea and anginal-like chest pain were noted in 14 (64%) patients treated with adenosine. Adverse hemodynamic effects were observed in one (45%) patient treated with verapamil. The incidence of conversion arrhythmias was 33% in adenosine-treated patients and 14% in verapamil-treated patients ($p < 0.05$). These findings emphasize that adenosine is a safe and effective drug for rapid termination of PSVT.

Coronary Angioplasty of Chronic Total Occlusions: Early Outcome and Factors Predictive of Initial Success

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In this study, we examined retrospectively 126 patients who had undergone angioplasty for chronic total occlusion, in order to evaluate the early outcome and the influence of clinical and angiographic factors on the initial success. The initial clinical and angiographic success was 62.7 %. The rate of major complication was 0.8 % (one patient with Q wave myocardial infarction). The initial success was related to the duration of occlusion (≤ 1 month, 76.7 %, > 1 month, 56 %; $p = 0.03$), the morphology of the stump (tapered, 71.8 %; abrupt cut-off 45.2 %; $p = 0.05$), the presence of side branch at the site of occlusion (no side branch, 72.2 %; side branch present, 40.5 %; $p = 0.009$) and the operator experience (first 63 patients, 49.2 %; last 63 patients, 77.8 %; $p = 0.002$). In the presence of antegrade filling, the initial success tended to be higher (functional total occlusion, 54.9 %; absolute total occlusion, 73.2 %; $p = 0.06$). We concluded that in the angioplasty of chronic total coronary occlusion the risk of complication is low, and the initial success rate depends on the duration and the morphology of the occlusion and the operator experience.

Relationship Between Ischemic Heart Disease and Leukocyte Aggregation with Activities of Glutathione Peroxidase and Superoxide Dismutase

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In view of the possible role of leukocytes and free oxygen radicals in the etiology of ischemic heart disease, we studied 22 acute myocardial infarction patients, 22 patients who had ischemic heart disease but no myocardial infarction and 24 healthy control subjects. White blood cell counts, leukery test for leukocyte aggregation and activities of glutathione peroxidase with superoxide dismutase were measured in these subjects. Activities of glutathione peroxidase and superoxide dismutase in patients with myocardial infarction (28.3 ± 1.3 U/ghb and 1289.2 ± 23.7 U/ghb, respectively) and ischemic heart disease without myocardial infarction ($28.9 \pm$ U/ghb and 1328.5 ± 22.7 U/ghb respectively) were found to be significantly lower than controls (32.2 ± 1.4 U/ghb and 1425.9 ± 36.2 U/ghb, respectively). Percentage of leukery and white blood cell counts in patients

with myocardial infarction (7.3 ± 0.5 % and $9085 \pm 199/\mu\text{l}$, respectively) were found to be significantly higher than controls (3.7 ± 0.4 % and $7130 \pm 299/\mu\text{l}$, respectively). Percentages of leukery in acute myocardial infarction group were significantly higher than in patients with ischemic heart disease without myocardial infarction. However, more extended clinical and experimental studies are needed to draw definitive conclusions for the prevention and etiology of ischemic heart disease.

Assessment of Left Ventricular Ejection Fraction by Acoustic Quantification: Comparison with Conventional 2-Dimensional Echocardiography

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The purpose of this study was to compare the recently developed new and alternative echocardiographic acoustic quantification (AQ) method with conventional 2-dimensional (2-D) echocardiography in measuring left ventricular ejection fraction (LVEF). Fifty two patients with a mean age of 57 ± 9 having sufficient echocardiographic view and in sinus rrythm were evaluated by 2-D echocardiography and AQ method using the apical 4-chamber and parasternal short axis positions during 5 cardiac cycles to establish the relationship between the two methods and to compare the variability of 2-D and AQ echocardiography in measuring LVEF in consecutive beats by the same physician. There was a good correlation between the measured values of LVEF in both positions using 2-D and AQ method ($r=0.86$, $r=0.91$, respectively), but a significant difference existed between conventional and AQ measurements of LVEF in the apical 4-chamber view ($p<0.05$). In contrast the difference and variability in LVEF measurement between each cardiac cyle was lower with AQ.

In conclusion, the on-line assessment of LVEF by AQ is well-related to conventional 2-dimensional measurements and seems to have the advantage to reduce the difference between each measurement of consecutive beats and intraobserver variability.

Early and Mid-term Results of Valve Replacement in the Treatment of Active and Healed Bacterial Endocarditis

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Between 1985-1994, forty-six patients underwent valve replacement (VR) operations for bacterial endocarditis at the Department of Cardiovascular Surgery of Türkiye Yüksek İhtisas Hospital. The diagnosis was active endocarditis in 10 patients and healed (chronic) endocarditis in 36 patients. Thirty-two patients were male and 14 female. The mean age was 32.4 ± 13.6 (range 13-65). Rheumatic etiology prevailed in all but three patients. Operative mortality was 2.2 %. The mean postoperative follow-up was 24.1 months. One patient with active endocarditis who underwent mitral VR (1.3 / 100 patient-years) developed paravalvular leak on the 7th day who required repeat mitral VR. One patient (1.3 / 100 pt-yr) developed prosthetic valve endocarditis and died of cerebrovascular accident. One patient with aortic VR underwent reoperation for aortic valve thrombosis.

We concluded that despite the existing medical problems during the early postoperative period, timely valve replacement decreases the mortality in active endocarditis. Postoperative intermediate-term survival does not differ for active and healed endocarditis.

Criteria for Reoperation and its Results in Recurrent Ventricular Septal Defects

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From July 1985 through May 1995, 1167 patients underwent surgical closure of ventricular septal defect (VSD), including 682 patients having complex cardiac pathologies in the Institute of Cardiology, University of İstanbul and in Florence Nihgingale Hospital. 21 of them required reoperation with the diagnosis of recurrent VSD (1.8 %). Indications for reoperation included significant left-to-right shunt ($Qp/Qs > 1.5$) and congestive heart failure in 20 patients and infective endocarditis with congestive heart failure in one. Reoperations were carried out 15 days to 84 months (mean 15.4 months) after the first operation. Patients' ages ranged from 20 months to 25 years (mean 10.2 years). All patients have been operated on with the technique of standard cardiopulmonary bypass, moderate hypothermia and cardioplegic arrest. Localization of the recurrent VSD's in relation to patch was posteroinferior in 16 and anterosuperior in 5 patients. In all cases except two, recurrent VSD was closed with double or triple primary suture

technique, and in two exceptions having distortion in aortic valve and infective endocarditis, the patch was removed and a new one was replaced. One patient died with septicemia and multiorgan failure in the postoperative 2nd month (mortality: 4.7%). Ventricular septal defects had been closed with continuous suture technique at the first operation in 20 patients who required reoperation. We have never seen any clinically important recurrent VSD after we began to use interrupted suture technique with pledgets. We conclude that closure of VSD's with a patch by using interrupted suture technique will decrease the incidence of recurrence. The operation period is not lengthened by this method.

Catheterizing Modified Blalock-Taussig Shunts in Cyanotic Congenital Heart Anomalies: Transvenous Technique

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From February 1994 to November 1995 transvenous (from femoral vein via right ventricle) pulmonary artery catheterization through modified Blalock-Taussig shunt was performed in 11 consecutive patients previously palliated with MBT shunt. In passing from right ventricle to aorta, 4 cm angled Judkins right coronary artery catheter (JR4) and hydrophilic guide-wire, and in entering to pulmonary artery through MBT shunt, JR4 or mammalian artery catheter and hydrophilic guide-wire were used. The patients' ages ranged from 1 to 13 years (mean 5.2 ± 3.22), weight from 6.6 to 30 kg (15.4 ± 6.35). The patients' diagnoses were: tetralogy of Fallot (TOF) (n=4), TOF and pulmonary atresia (n=5), double outlet right ventricle with ventricular septal defect (VSD) and pulmonary stenosis (PS) (n=1), and transposition of the great arteries with VSD and PS (n=1). MBT shunts were localized in the left in 8 patients and in the right in 3 patients. Pulmonary vascular anatomy was visualized in detail in all patients. During catheter or guide-wire manipulations, short-term complete AV block was observed in 2 patients. As a conclusion: in cyanotic congenital heart anomalies in which aorta is directly related to right ventricle, catheterization of the pulmonary arteries through MBT shunt via transvenous route can be applied successfully, and this technique has some advantages.

Review

Nonvalvular Infections of the Cardiovascular System

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Nonvalvular infections of the cardiovascular system usually occur on previously damaged nonvalvular endocardium or vascular intima. They are also closely associated with intravascular devices and prosthetic materials. In one recent prospective study of bacteremia from Australia, nosocomial bacteremias accounted for 40 % of all cases of bacteremia and half of the nosocomial cases were device-associated. In addition to intravascular catheter-related infections, pyogenic infections of myocardium, Mural endocardium, cardiac tumors, implantable devices, arterial walls, and prosthetic vascular grafts are included in nonvalvular infections of the cardiovascular system. Since they are seen less commonly compared to valvular infections of the cardiovascular system, there is no consensus on their prevention, diagnosis and treatment. The mortality and morbidity rates vary according to the type and localization of nonvalvular infection.

Case Reports

Prostacyclin Usage in Treatment of Acute Right Heart Failure During Mitral Valve Replacement

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In three patients with pulmonary hypertension (mean pulmonary artery pressure was $91\pm4.5/52\pm9.6$ mmHg) acute right heart failure developed after mitral valve replacement. Because weaning from cardi-

opulmonary bypass was unsuccessful despite various medical and mechanical (intraaortic balloon) supports used, prostacyclin (Flolan, 5-20 nanogram/kg/min) was begun intravenously. We observed improvement of right ventricular contraction and decrease of mean pulmonary artery pressures to $52\pm2/29\pm6.2$ mmHg ($p<0.05$) associated with decrease of mean pulmonary vascular resistance to 62 ± 6 from 340 ± 28 dyn.sec./cm⁵ ($p<0.05$) within first 30 minutes after prostacyclin administration. Then, all patients were weaned from cardiopulmonary bypass. A complication related to prostacyclin was not detected. We concluded that combination of prostacyclin with inotropic drugs is an effective therapy to improve the deteriorated hemodynamics of these patients.

Double Valve Replacement in a Patient With Hb S - Beta Thalassemia

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Open heart surgery in patients with hemoglobinopathies have been reported rarely. These patients present potential management problems during the intraoperative and postoperative period. Cardiopulmonary bypass causes some unavoidable hemolysis, platelet destruction, acidosis and protein denaturation. We report a case presenting with Hb S-beta thalassemia who underwent replacement of the aortic and mitral valves with Medtronic prostheses and tricuspid annuloplasty without serious complications as a result of appropriate perioperative management.