

Summaries of Articles

Clinical Investigations

Carbon Coating Has No Effect on Inflammatory Response to Primary Stent Deployment

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To investigate the effects of carbon-coating of stents on inflammatory response we serially measured plasma levels of C-reactive protein (CRP), fibrinogen and cytokines (tumor necrosis factor, interleukins 1- β , 6 and 8) in patients with single vessel coronary stenosis with no any inflammatory or infectious disease who underwent primary stent insertion.

Forty-six patients with single coronary lesions were included. Blood samples were obtained before and 2, 4, 6, 24 and 48 hours after the procedure. In a randomized order, either an uncoated MAC (AMG® Raesfeld-Erle, Germany) (UC-MAC) or a carbon-coated MAC (CC-MAC) stents was deployed without predilatation at a maximum pressure of 6 atmospheres for a duration of 90 seconds.

Of the 46 patients (38 male, 8 female; age 55 ± 9) included. Fourteen had stable, 27 unstable and 5 atypical angina. According to the ACC / AHA classification 35 lesions (76.1%) were type A, 10 (21.7%) type B and 1 (2.2%) were type C. Stents implanted to stenosis of 28 left anterior descending, 12 circumflex and 6 right coronary arteries.

Serum interleukin 6 (IL-6) levels increased significantly in both CC-MAC and UC-MAC groups and returned to normal after 24 hours. Plasma fibrinogen, CRP levels and leukocyte counts also increased in both groups ($p < 0.05$). There was no difference between the two groups in regard to IL-6, CRP and fibrinogen increase. The percent increase in IL-6, fibrinogen or CRP levels were not associated with the stent length, stent size or the clinical presentation (all $p > 0.05$). In conclusion stent implantation increases plasma IL-6, fibrinogen and CRP levels. This unfavorable inflammatory response seems not to be effected by carbon coating.

Key words: Inflammation markers, stent deployment, carbon coating stents

Catheter Ablation of Typical Atrial Flutter Guided by Electroanatomic Mapping (CARTO)

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Linear radiofrequency catheter ablation within the tricuspid annulus-inferior caval vein isthmus can cure typical atrial flutter. Recently developed new mapping methods have properties that can increase the success rate and decrease overall fluoroscopy time, recurrence rate and mean RF pulse numbers. In this study, we report the results and properties of radiofrequency catheter ablation of typical atrial flutter guided by a new mapping method, electroanatomic mapping (CARTO). A total of 8 patients (6 men, 2 women; 48.4 ± 11.5 year-old) presenting to our hospital between June-October 2001 with typical atrial flutter refractory to at least 2 antiarrhythmic drugs underwent to ablation procedure with electroanatomic mapping system (CARTO). The overall fluoroscopy time, including the placement of diagnostic catheters, mapping, ablation and; total procedural time were 12.8 ± 3.7 and 76 ± 30.4 minutes, respectively. The mean number of RF pulses was 9.5 ± 3.7 . In all patients, sinus rhythm was obtained and total isthmus block was achieved. No procedure-related complications were seen. After the procedure, atrial fibrillation was seen in one patient. During the follow-up, atrial flutter recurred in one patient 2 months after the ablation procedure. Electroanatomic mapping during the induction of linear lesions for the ablation of atrial flutter permitted a highly significant reduction in exposure to fluoroscopy while maintaining high efficacy.

Key words: Atrial flutter, catheter ablation, fluoroscopy, electroanatomic mapping

The Effect of Enalapril and Nifedipine on Myocardium and Lung in Chronic Hypoxemia

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The aim of this study was to determine the effect of angiotensin converting enzyme inhibitors and calcium channel blockers on myocardium and lung tissue in chronic hypoxic conditions. For this purpose, we have examined the conjugated diene, malondialdehyde (MDA), reduced glutathione (GSH) and total antioxidant (TAA) levels in rats. Twenty Sprague Dawley rats were included in the study. Group 1 rats (n=5) were utilized as sham animals. Group 2 (n=5) rats were used as control animals and they were housed in a hypoxic chamber for 3 weeks. Group 3 (n=5) animals received enalapril 0.2 mg/kg via gastric gavage for 3 weeks while they were kept in hypoxic chamber. Group 4 animals received 0.75 mg/kg nifedipine for 21 days while they were kept in hypoxic condition. All animals were sacrificed at the end of 21 days and their heart and lungs were excised for biochemical determination of tissue damage. Results: Myocardial and lung conjugated diene, MDA and TAA levels were significantly different in the control group than the nifedipine and enalapril groups (lung conjugated diene, 91.8 ± 5.35 nmol/g in group 2 vs 57.9 ± 5.19 nmol/g in group 3 and 68.7 ± 3.9 nmol/g in group 4, $p < 0.001$; TAA, 4.5 ± 0.3 nmol/g in group 2 vs 5.1 ± 0.1 nmol/g in group 3 and 5.2 ± 0.14 nmol/g in group 4, $p < 0.001$). There was no significant difference between the enalapril and nifedipine groups. In conclusion chronic hypoxia impairs postischemic myocardial antioxidant reserve and yields to lung damage. Enalapril and nifedipine protects the heart and lungs in chronic hypoxemia against further damage.

Key words: Ischemia/reperfusion injury, hypoxia

Effects of Dobutamine on Hemodynamic Parameters in Patients with Mitral Stenosis and Determinants of Pulmonary Artery Pressure Response

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Background: The mechanisms of the different hemodynamic and clinical responses to dobutamine infusion in mitral stenosis are not clearly

established. The aim of this study was to evaluate the changing hemodynamic parameters in patients with mitral stenosis that correlates with dyspnea during dobutamine infusion using Doppler echocardiography and to assess determinants of pulmonary artery pressure response.

Methods and Results: Fifty-seven consecutive asymptomatic or mildly symptomatic patient (51 women, 6 men; mean age 43 ± 7 , range from 26 to 52), New York Heart Association (NYHA) class I (n: 9), class II (n: 48) with mitral stenosis (mean mitral valve area 1.6 ± 0.4 cm²) were evaluated with dobutamine stress echocardiography. Dyspnea developed during dobutamine infusion in 18 patients (Group B), but the other 39 patients remained asymptomatic (group A). There was a significantly greater increment in mitral peak gradient (14 ± 7 vs 9 ± 4 mmHg, $p = 0.008$), mean gradient (12 ± 6 vs 6 ± 3 mmHg, $p < 0.0001$), and pulmonary artery systolic pressure (23 ± 8 vs 16 ± 6 mmHg, $p = 0.007$) during dobutamine infusion in the patients who developed dyspnea than in those who did not. Furthermore the hemodynamic response to dobutamine identified a subgroup of patients with more serious mitral stenosis. Based on these clinical and hemodynamic results, management was changed in 12 patients (21%): 7 underwent percutaneous mitral balloon commissurotomy, 4 underwent mitral valve replacement, and 1 received intensive medical treatment. In all patients, pulmonary artery systolic pressure ($p < 0.0001$), mean mitral gradient ($p = 0.001$) at rest, mitral valve area ($p = 0.003$) and subvalvular mitral score ($p = 0.001$) which is the sign of the mitral valve damage were significantly correlated with pulmonary artery pressure response.

Conclusion: In conclusion, our results suggest that patients who have provoked dyspnea during the dobutamine infusion have a greater increase in hemodynamic parameters than patients who do not. Pulmonary artery pressure response correlates with baseline pulmonary artery pressure, mean gradient, mitral valve area and subvalvular echo score and pulmonary artery pressure response can be predicted by these parameters.

Key words: mitral stenosis, sinus rhythm, dobutamine, echocardiography

Usefulness of Myocardial Fractional Flow Reserve in Optimum Stent Deployment

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Introduction: It was reported that intravascular ultrasound (IVUS), findings the gold standard in stent deployment, were correlated with myocardial fractional flow reserve (FFR_{myo}) in stent deployment. This study was aimed to assess the usefulness of FFR_{myo} in stent deployment.

Methods: In 21 patients (19 male, 2 female; mean age 57.4±9.7 years) with single-vessel disease and primary stenting planned, Mag carbon stent corresponding with reference vessel diameter was implanted and inflated to a 1-atm higher pressure than full stent expansion was achieved after basal quantitative coronary analysis (QCA) and FFR_{myo} measurements. FFR_{myo} and QCA were secured, and in patients in whom target FFR_{myo} (>0.94) and QCA stenosis (≤10%), were not achieved inflation pressures were increased with steps of 2 atm to achieve target levels. Patients were followed up 6 months, and underwent maximal exercise testing with Bruce protocol.

Results: Although target QCA diameter was achieved in 17 patients after first inflation, target FFR_{myo} was attained in 13 patients. Optimum FFR_{myo} was achieved in one patients of spite QCA was not. In 8 patients in whom target levels were not achieved second inflation was performed, and optimum QCA was obtained in 6 of 8, optimum FFR_{myo} was obtained in 5 of 8. In the remaining 3 patients both target QCA and target FFR_{myo} were obtained after the third inflation. Mean inflation pressure was 11.90±1.84 atm (8-14 atm) for the target QCA and 12.48±1.66 atm (8-14 atm) for the target FFR_{myo}. No patient experienced recurrent angina, acute myocardial infarction, need for revascularisation and death during the six-month follow-up period. In all patients, target heart rate was achieved at exercise testing and no patients exhibiting positive test results.

Conclusion: The combined use of FFR_{myo} and QCA may prevent unnecessary high-pressure inflation. We think that FFR_{myo} might be an

alternative easy and cheaper method for stent deployment in centers in which IVUS is not available.

Key words: Stent, fractional flow reserve

Stent Insertion in Coronary Bifurcation Lesions: Procedural Success and Long-term Follow-up Results

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We aimed to evaluate procedural success rates and long-term follow-up results of patients who underwent stent insertion for coronary bifurcation lesions which are associated with a lower success and higher complication rate than most other lesion types. Forty-five patients who underwent stent implantation for coronary bifurcation lesions were included in the study. Angiographic features and quantitative analysis of each lesion, procedural success rates and in-hospital and long-term clinical outcomes were assessed.

Results: Forty-five patients were included, mean age 55.3±11.6 years, 75.5% male, 46.4% with unstable angina, 40% stable angina, and 13.4% acute myocardial infarction. The left anterior descending/diagonal bifurcation was involved in 46.9% of cases, circumflex/marginal in 28.9%, PDA/PLA in 19.7%, left anterior descending/circumflex in 4.5%. The main branch (3.06±0.36 mm reference diameter) and the side branch (2.4±0.39 mm) was stented in all cases. Procedural success was obtained in 84.4% in both branches. At 1-month follow-up, the major cardiac event rate (MACE) was 8.8% (death 4.4%, emergency CABG 0%, non-Q-wave MI 2.2%, repeat PTCA 2.2%). At 15±8.9 month follow-up, the total MACE rate was 44.5% (death 15.6%, CABG 15.6%, Q-wave MI 6.7%, repeat PTCA 13.3%).

Conclusion: We conclude that the treatment of bifurcation lesions with stenting is associated with decreased success and increased complication and MACE rates compared with nonbifurcation lesions.

Key words: Coronary bifurcation, stent insertion

Review

Intravascular Ultrasound for Detection of Coronary Atherosclerosis

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New diagnostic modalities are being introduced to the clinical practice for the detection of coronary atherosclerosis, owing to the advances in technology in the last twenty years. Intravascular ultrasound (IVUS) is one of these, where a high frequency ultrasound transducer, built at the tip of a catheter, detects and measures the luminal diameter and the area of the coronary artery, changes in arterial wall structure, and the features of the atherosclerotic plaque and the lesion site. The capability of IVUS to demonstrate the atherosclerotic process in vivo is unique. Despite some limitations, this diagnostic modality provides as much data as no other imaging technique does and thus has started to influence the clinical decisions made in cardiac catheterization laboratories.

Key words: Coronary atherosclerosis, intravascular ultrasound.

Case Reports

Acute Severe Myocarditis in a Woman with Hypereosinophilic Syndrome

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A 48-year-old woman who had cough attacks and dyspnea for the past year was diagnosed as having asthma bronchial. Computerized tomography, showed cystic bronchiectasis at the left lung lower lobe. No specific findings existed at bronchoscopy and bronchoalveolar lavage. Since Medical treatment did not provide amelioration of symptoms left lower lobectomy was carried out.

One month later, the patient was admitted with clinical findings of congestive heart failure. There was

wide QRS tachycardia at ECG. Troponin T level was above 2 ng/ml. White blood cell count was 19500/mm³ and eosinophil was 11920/mm³. After cessation of tachycardia by using lidocaine, there was right bundle branch-block, precordial Q waves and poor R wave progression at ECG on following days. Severe hypokinesia on anterior wall, moderate mitral insufficiency, moderate systolic dysfunction, mild pericardial effusion and severe pulmonary hypertension were present at echocardiographic investigation. Heparin, aspirin, nitroglycerin, furosemide, losartan and digoxine was given to the patient. The investigations about parasitic infections and collagen-vascular disease were negative. The patient was diagnosed as having idiopathic hypereosinophilic syndrome and methylprednisolone was given at a dose of 40 mg/day, followed by amelioration of findings. Coronary arteries were found normal but anterolateral hypokinesia and apical akinesia were found. Two months later at control echocardiography, systolic function was better than previous examination and systolic pulmonary artery pressure was found to be lower. This represents a rare development of acute severe myocarditis in a patient with hypereosinophilic syndrome, we decided to report this case.

Key words: Hypereosinophilic syndrome, acute myocarditis, coronary artery disease.

A Case of Behçet's Disease Presenting with Superior Vena Cava Syndrome, Pericarditis and Pleurisy

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A patient presenting with the complaints of swelling in face and upper body, dyspnea and a sharp chest pain was diagnosed as having vena cava superior syndrome, pleurisy and pericarditis due to Behçet's disease. Differential diagnosis and follow-up findings were discussed with reference to the literature.

Key words: Behçet's disease, thrombosis, pleurisy, pericarditis