Summaries of Articles

Clinical Investigations

The Determinants of Vena Contracta and Its Value in Evaluating Severity of Aortic Regurgitation

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Recent studies evaluating the severity of valvular insufficiencies have focus on effective orifice area (EOA). This area corresponds hydrodynamically to the cross-sectional area of the vena contracta (VC), the smallest cross-sectional area of the regurgitant flow stream. The aim of the present study was to quantify the aortic regurgitation (AR) by using the color Doppler imaged VC.

Methods: The fifty five patients with chronic AR were enrolled in the study. VC was visualized by transthoracic echocardiography from the apical echocardiographic window. Quantitative Doppler (QD) method depending on mitral (SV_m) and aortic stroke volumes (SV_{ao}) was taken as reference method. EOA, regurgitant volume (RV) and regurgitant fraction (RF) were calculated by using both VC and QD simultaneously in all patients. By using VC; EOA, RV and RF were calculated as follows: EOA_{VC}= $(VC)^2$ x $\pi/4$, RV_{VC}= EOA_{VC} x VTI_{AR} and RF_{VC}= RV_{VC}/SV_{ao}. The same parameters were obtained by QD method as: RV_{QD}= (SV_{ao})-(SV_m), RF_{QD}= (RV_{QD}/SV_{ao}) x 100 and EOA_{QD}= RV_{QD}/VTI_{AR}. The relationships between VC and patients parameters were evaluated by using simple linear regression analysis. To find the determinants of VC, multivariate analysis was performed with the parameters having significant correlations. Parameters obtained by both methods were compared with each other using simple regression analysis and the method of Bland-Altman for agreement.

Results: EOA_{QD} (r=0.96), RF_{QD} (r=0.84), RV_{QD} (r=0.82), angiographically III/IV degree AR (r=0.74), patient age (r=-0.67), and left ventricle end-diastolic diameter (r=0.47) had statistically significant correlations with VC (0.48±0.12 cm). As the result of the multivariate analysis with these parameters, VC was found to be related with only EOA_{QD}. The EOA (r=0.96, p<0.001; mean difference 0±0.03 cm^2, SEE=0.004 and p>0.05), RV (r=0.97, p<0.001; mean difference =1.3±4.8 cm^3, SEE=0.65 cm^3 and p>0.05) and RF (r=0.93, p<0.001; mean difference =1.46±4.9%, SEE=0.66% and p>0.05) obtained by both methods agreed well with each other. VC had a sensitivity of 80%, specificity of 86% and accuracy of 84% in determining severe AR when the lower limit was taken as 0.54 cm.

Conclusion: VC obtained by color Doppler is a simple and reliable noninvasive parameter for evaluating severity of AR.

Key words: Aortic regurgitation, vena contracta, quantitative Doppler echocardiography

Silent Brain Infarction in Patients with Rheumatic Mitral Stenosis

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Silent brain infarction (SBI) frequency is increased in patients with carotid stenosis and atrial fibrillation (AF), but its relation with rheumatic mitral stenosis (MS) (another major embolic source) is uncertain. The aim of this study is to investigate SBI incidence in patients with MS.

Silent brain infarction is defined as asymptomatic infarction detected on computerized tomography (CT) in patients without a history of stroke. Transthoracic echocardiographically (TTE) diagnosed 53 patients (44 F, 9M; mean age 38±7 years) with MS were enrolled in the study. Mitral valve calcification, left atrium (LA) diameter and presence of mitral regurgitation were recorded. Besides TTE, electrocardiographic recording for rhythm analysis, detailed neurologic examination and cerebral CT were also performed. SBI-detected patients on CT underwent carotid artery Doppler examination to exclude carotid artery lesions. History of hypertension and diabetes mellitus, presence of carotid murmur, presence of LA thrombus, left ventricular systolic dysfunction and other valve diseases on TTE, were the exclusion criteria.

Results: Silent brain infarction incidence was 24.5% in patients with MS. The incidence was significantly higher in patients with LA diameter >4 cm or with atrial fibrillation ($p<0.05$). If AF was associated to enlarged LA, SBI incidence was markedly higher than the ones with sinus rhythm and small LA ($p<0.01$). When moderate to severe mitral regurgitation was associated to MS, SBI incidence was lower ($p<0.05$). Although SBI incidence was higher in patients with mitral valve area <1.5cm^2, it was not significant ($p>0.05$). No significant relation was found between calcific and noncalcific valves for SBI ($p>0.05$).

Conclusion: SBI was detected in one-quarter of MS patients. Association of LA enlargement and AF increase SBI incidence, whereas association of moderate to severe mitral regurgitation decreases SBI incidence.

Key words: Mitral stenosis, silent brain infarction

Relationship Between Regional Diastolic Function and Left Ventricular Mass in Essential Hypertension

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Pulsed wave tissue Doppler imaging (PTD) is an appropriate method to determine regional left ventricular (LV) diastolic function. The study was designed to evaluate regional left ventricular diastolic function and its relation with left ventricular mass in essential hypertension. For this purpose, PTD myocardial velocities (Em, Am) and velocity time integrals (VZI) of left ventricle basal and mid segment of anterior, inferior, interventricular septum and lateral wall; also mitral inflow pattern and isovolumic relaxation time (IVGZ) were evaluated at apical 2- and 4-chamber transthoracic examinations in 15 (mean ages:54(7) normal subjects, 16 hypertensive patients (mean ages: 56±8) without LV hypertrophy, 24 hypertensive patients (mean ages:58±7) with LV hypertrophy. LV mass index >125 g/m^2 for men, >110 g/m^2 for women was accepted as criterion for LV hypertrophy according to LV mass index calculated by the Devereux formula. Patients taking antihypertensive medications were not included in the study. Univariate analysis showed that the mitral E/A and PTD Em/Am ratios were significantly decreased in hypertension. However, when we compared the normal group with hypertensive patients without hypertrophy and with hypertrophy by using student t test, we observed that PTD Em/Am ratio in all myocardial segments significantly decreased in the presence of LV hypertrophy but only mean PTD Em velocity of lateral and anterior wall basal segments were significantly different in the absence of LV hypertrophy.

These findings suggest that regional LV diastolic functions of hypertensive patients without LV hypertrophy are more pronouncedly deteriorated in the anterior and lateral basal segments but deterioration of regional diastolic function occurs uniformly in all myocardial segments if an obvious LV hypertrophy is present.

Key words: Regional diastolic function, left ventricle

Effects of Losartan and Lisinopril on the Ambulatory Blood Pressure in Previously Untreated Patients with Mild to Moderate Essential Hypertension

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The aim of this study was to compare the effects of two long-acting antihypertensive agents, the ACE inhibitor lisinopril and the angiotensin II type 1 receptor antagonist losartan on clinical and ambulatory blood pressure in previously untreated patients with mild to moderate essential hypertension.

60 patients between 33 and 67 years of age with systolic blood pressure >140 and <179 mmHg and diastolic blood pressure >90 and <109 mmHg were randomized to receive either 10-20 mg lisinopril (n=30) once a day or 50-100 mg losartan (n=30) once a day for 12 weeks. The drugs were titrated after 4 weeks if systolic blood pressure >140 mmHg and diastolic blood pressure >90 mmHg. Routine laboratory, office and ambulatory blood pressure measurements were assessed at baseline and at 12 weeks. With losartan and lisinopril clinical systolic

and diastolic blood pressure (S/DBP) values decreased by 20.8/15.2 and 16.8/12.2 and 24-hour mean S/DBP by 15.1/9.9 and 13.6/8.5 mmHg, respectively ($p<0.0001$). Losartan reduced clinical S/DBP values to a significantly greater extent than lisinopril ($p<0.05$).

Although both losartan and lisinopril were found to be effective in reducing blood pressure in patients with mild to moderate essential hypertension, the decrease in S/DBP with losartan was greater compared to lisinopril. Randomized studies with larger patient populations should be conducted to compare directly the two different treatment regimens.

Key words: Essential hypertension, ambulatory blood pressure, angiotensin converting enzyme inhibitors, angiotensin II receptor antagonists

Early Postoperative Effects of Vitamin E and C Supplement on Coronary Bypass Patients

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Free radical lipid peroxidation contributes to the abnormal metabolism and ventricular function frequently seen after cardiac operations. Antioxidants may improve metabolic and functional recovery. A prospective, randomized clinical trial was conducted to determine the effects of vitamin E and C in 20 patients who were divided into two equal groups undergoing elective coronary bypass operations. Myocardial enzyme levels and ventricular function were assessed after the operation; antiarrhythmic and inotrope requirements were recorded. Cardiac indices were higher in vitamin E and C-treated group 6 hours after surgery ($p<0.05$). Postoperative creatine-kinase MB levels were lower (statistically notsignificant) in patients who received vitamin E and C. In regard to the requirement of inotrope and anti-arrhythmic agents, no statistically significant difference existed between the vitamin E and C-treated group and the control group.

Supplementation with vitamin E and C may be useful for coronary by-pass patients who under cardiopulmonary bypass.

Key words: Vitamin E, vitamin C, coronary bypass

The Investigation of the Ischemic Response in the Patients with Coronary Slow Flow by Atrial Pacing

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Pathophysiology of the chest pain is not precisely known yet in patients who does not have fixed coronary lesion but slow coronary flow by angiography. In this study, our aim is to display metabolic ischemia via atrial pacing to determine the difference of lactate production and arteriovenous oxygen content (AVO2). The 34 patients with slow coronary artery flow detected by coronary angiography via TIMI "frame count" method were included. All patients underwent myocardial perfusion tomography. Resting and stress images were recorded. Lactate extraction and AVO_2 content values determined before and after atrial pacing. Patients were classified according to their response. Twenty-eight patients (18 male, 10 female, mean age 54.42±9.61) (Group I) did not have metabolic ischemia while 6 patients (4 male, 2 female, mean age 60±5.76) (Group II) showed evidences of metabolic ischemia. There was not significant increase in AVO_2 content after pacing (57.37±2.05, 57.96±2.65; $p<0.061$) in Group I. Statistically significant difference were found in Group II (58.23±2.1, 68.35±2.15; $p<0.028$). Comparison of AVO_2 contents showed that there was not significant difference in basal values ($p<0.43$) but levels after pacing were significant ($p<0.001$). Lactate extraction rates before and after pacing decreased in two groups (0.24±0.10, 0.15±0.15; $p<0.028$ and 0.23±0.18, -0.471±0.27; $p<0.01$). Reduction was more prominent in Grup II.

Basal lactate extraction were similar in both groups, but significant decrease in Group II after atrial pacing were found ($p<0.0001$). Metabolic ischemia was not ascertain in 82.4% of patients in this study group. Positive perfusion scintigraphy rate was 83.3% in patients with proven metabolic ischemia.

Our data confirmed that chest pain was not originated from myocardial ischemia in significant number of patients with slow coronary flow. We

concluded that perfussion sintigraphy is reliable and accurate method for determination of ischemia in this group of patients.

Key words: Coronary slow flow, atrial pacing, myocardial metabolism

Cardiac Amyloidosis Involving the Pericardium: A Case Report

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Amyloidosis results from the deposition of fibrous amyloid proteins, frequently in the extracellular spaces of tissues and organs. In systemic amyloidosis, cardiac manifestations consist primarly of congestive heart failure and cardiomegaly and a variety of arrhythmias. These manifestations prominantly reflect diffuse involvement by myocardium amyloid, the endocardium, and valves. Pericarditis with effusion is very rare and rarely results in tamponade in cardiac amyloidosis.In this report, a case with cardiac amyloidosis involving pericardium is presented and reviewed the cardiac amyloidosis.

Key words: Pericardium, amyloidosis

Acute Myocardial Infarction Secondary to Coronary Embolism in a Patient with Mitral and Aortic Valve Prothesis: A Case Report

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Prosthetic cardiac valve thrombosis is a serious and potentially lethal complication. Prosthetic valve thrombosis generally related to inadequate anticoagulation can result in systemic emboli. In recent years, increasing rate of prosthetic valvular surgery has been another significant source for coronary emboli. Myocardial infarction secondary to coronary embolization is an infrequent but life-threatening complication of cardiac valve replacement. In this paper, it was presented a case of coronary embolus resulting in acute myocardial infarction in a patient with prosthetic mitral and aortic valves taking inadequate anticoagulation therapy.

Key words: Mitral prosthetic valve thrombosis, coronary emboli, acute myocardial infarction

Arrhythmogenic Right Ventricular Cardiomyopathy and Therapeutical Approaches

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Arrhythmogenic right ventricular cardiomyopathy (ARVC) is characterized by fibro-lipomatous infiltration of right ventricular free wall and ventricular tachycardia with left bundle branch block morphology in young adults. Clinical manifestations include structural and functional abnormalities of right ventricle and arrhythmias leading to sudden death. The most common cause of death is ventricular tachycardia. Retrospective evaluation of young sudden deaths and screening of their families have revealed that ARVC has wide clinical and pathologic spectrum and more important place in the etiology of sudden death. Recently as a result of advances in genetic technology, chromosomal abnormalities responsible for disease were identified. Electrocardiographic, echocardiographic, magnetic resonance imaging and right heart catheterization features and diagnostic criteria of the disease are well defined. Although a lot of therapeutical implications have been used to improve survival and to provide a better quality of life, it seems impossible to have cure with today's therapeutical modalities. According to the severity and the extent of right ventricular disease, pharmacological and non-pharmacological therapies including surgery, radiofrequency ablation and implantable cardioverter defibrillators (ICD) have been used to prevent ventricular tachycardia and sudden death in patients with ARVC. Since ARVC is a progressive disease and has a high recurrence rate with medical, surgical and ablation therapies, ICD implantation will play more important role in preventing of ventricular tachycardia and sudden death in the future.

The purpose of this article is to review the clinical manifestations, recently defined genetic aspects, diagnosis, prognosis and new treatment modalites of ARVC.

Key words: Arrhythmogenic right ventricular cardiomyopathy