HEART VALVE DISEASE

449 Prognosis of carcinoid heart disease: value of tissue Doppler imaging
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Background: Carcinoid heart disease (CHD) may occur in patients with digestive endocrine tumor and carcinoid syndrome. No previous studies have assessed the use of tissue Doppler imaging (TDI) in CHD. The aim of this prospective study was to evaluate the prognostic value of TDI in CHD.

Methods: We prospectively studied 56 consecutive patients (1989-2005) with proved digestive endocrine tumor and carcinoid syndrome. Patients with previous history of heart disease were excluded. All patients underwent several echocardiographic studies for the assessment of CHD and the CHD progression (echocardiographic scoring system). Furthermore, we systematically calculated the mitral inflow to annulus ratio (E/E' ratio) using PW Doppler (mitral inflow) and TDI (lateral mitral annulus). Survival rate was collected at the end of the study.

Results: Mean age was 59±9 years. Mean follow-up was 27±16 months. A right-CHD was found in 30 patients (54%) and a left-CHD in 13 patients (23%). The prevalence of right- and left-CHD significantly increased during follow-up (p<0.001). The only independent marker of death (multivariate analysis) was an E/E' >8 (odds ratio = 6.2; 95% CI 1.95-19.7; p=0.002) (see Kaplan Meier curves).

Conclusions: This prospective study demonstrates that tissue Doppler imaging allows to detect high-risk patients with carcinoid syndrome. Patients with E/E' ratio >8 should be cautiously monitored during follow-up.

450 Transthoracic and transesophageal echocardiographic evaluation of the ischemic mitral regurgitation heart surgery patient
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Aims: The aim of the study was to evaluate the factors determining the mitral regurgitation in patients with left ventricular remodelling after myocardial infarction.

Methods: 52 consecutive patients (mean age 62±9 years) with mild to moderate ischemic mitral regurgitation due to prior myocardial infarction underwent transthoracic echocardiographic examination. By means of Doppler echocardiography we evaluated the mitral regurgitant volume (RV), the regurgitate fraction (RF) and the effective regurgitant orifice area (EROA). 35 patients also underwent transesophageal echocardiographic examination in order to evaluate the geometry of the subvalvular mitral apparatus. In the transgastric 2-chamber view (90°e) we measured the length of the shortest chordae tendinae from the head of the papillary muscle (PM) to their anchoring point on the valve between the segments P3 and A2 of the mitral leaflets (Z2) and, respectively, from the head of the anterior papillary muscle (AL) to the anchoring point on the valve between the segments P1 and A2 (Z1). The displacement of the papillary muscles was evaluated by the measurement of the distance from PM and AL to the respective opposite point on the mitral annulus (PMA and, respectively, ALA) We also determined the distance between PM and Z1 (PMR) and, respectively, between AL and Z2 (ALR).

Results: There was a significant correlation of the mitral annulus area (MA) with RV (r=0.462, p=0.0006) and EROA (r=0.350, p=0.0453). The correlation between PMR was more significant for ERA <0.3 cm² (r=0.613, p=0.0019). MA significantly correlated with RF only for RF from 30% to 60% (r=0.478, p=0.0075). EROA showed no dependence on the length of the cordae tendinae and the parameters of the papillary muscles displacement. The PMA/PMR ratio, a marker of the leaflets restriction at the level of the point Z1, correlated very well with EROA (r=0.99, p=0.0011) only for EROA >0.4 cm² (5 patients).

Conclusion: In patients with ischemic mitral regurgitation after myocardial infarction, the mitral annulus enlargement is one of the determinants of the regurgitant volume and of the effective regurgitant orifice area. It seems that in the case of the mitral regurgitation with smaller regurgitant orifice area (<0.3 cm²), the importance of the regurgitation depends mainly on the enlargement of the annulus, on the other hand, in the case of the mitral regurgitation with larger regurgitant orifice area (>0.4 cm²) the leaflets restriction determined by the posterior papillary muscle displacement plays a very significant role.

451 Ischemic mitral valve: value of papillary muscle distance
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Objective: Ischemic mitral regurgitation is a complex lesion to repair and successful management requires an understanding of its mechanism and severity. Ring annuloplasty is currently the most common surgical treatment for ischemic mitral regurgitation. Failure rates for this technique may be as high as 30% in patients with functional ischemic MR. Papillary muscle distance (PMD) could be a clue indicating annuloplasty alone is not sufficient in this subgroup.

Material and methods: We evaluated PMD (distance between papillary muscles in systole) in 100 patients with chronic moderate to severe ischemic MR that were operated on CABG and mitral valve annuloplasty with acceptable result and followed them for two years.

Results: After two years there were 24 patients with significant MR (equals or more than 2+) in 94 alive patients. Baseline PMD was significantly greater in patients with late MR compare with patients without MR (27 versus 15 mm, p<0.001).

Conclusion: PMD is a reliable index of significant dysfunctional subvalvular apparatus in patients with ischemic MR and can predict late MR after repair and provide implications for valve repair.

452 Reduction of functional mitral regurgitation is associated with improving inferior myocardial systolic function with low-dose dobutamine assessed by tissue doppler imaging
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Background: It has been shown that functional mitral regurgitation (MR) was associated with mitral annular enlargement, leaflet tethering, and left ventricular (LV) dilatation, sphenicization, and dysfunction. However, the quantitative evaluation of relationship between functional MR and regional myocardial function has not been done. Dobutamine has been known to have the ability to improve inferior myocardial systolic function with low-dose dobutamine assessed by tissue Doppler imaging.

Methods: We studied 18 patients with reduced LV ejection fraction (34±9.5%) secondary to ischemic (12 patients) or nonischemic (6 patients) cardiomypathy and MR. Standard 2-dimensional echocardiography was performed during 4-chamber, 2-chamber and long-axis views were recorded with tissue Doppler imaging at rest and during dobutamine infusion (10μg/kg/min). We obtained LV ejection fraction, MR volume fraction, tenting area of mitral valve (enclosed between the annular plane and leaflets on the 4-chamber view) and as indices of regional myocardial function, LV longitudinal peak systolic strain rate (Ssr, absolute value) in the anterior, anteroepsest, posterior, and posterior and lateral segments at the mid ventricular level.

Results: Dobutamine increased heart rate, systolic blood pressure, LV ejection fraction and Ssr in all segments, and decreased tenting area and MR volume fraction. The decrease in MR volume fraction with dobutamine showed a significant correlation with decrease in tenting area (r=0.76, p<...
P Wave duration and dispersion in mitral valve prolapse

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Aims: P wave dispersion (PWD) is an electrocardiographic measurement, which reflects a disparity in atrial conduction and vulnerability to atrial fibrillation. In this study, we compared P wave duration and PWD of mitral valve prolapse (MVP) patients with healthy control subjects. We also investigate the echocardiographic determinants of PWD in MVP patients.

Methods and results: Sixty-nine MVP patients (mean age 36.1±12.4 years) and 32 healthy control subjects (mean age 35.5±10.9 years) were included in the study. Twelve-lead surface electrocardiography recording was obtained from all participants. The change in maximum and minimum P wave duration was measured manually and the difference between the two values was defined as PWD. There was no difference between the two groups in terms of baseline demographic characteristics. Maximum P wave duration was higher in MVP patients than controls (123.8±7.2 vs 115.3±6.1 ms, p=0.007). Minimum P wave duration was found to be similar in MVP patients and healthy controls. Mean PWD value of MVP patients was found to be higher than those of controls (52.6±12.7 vs 46.2±9.1 ms, p=0.01). In patients with MVP, multiple regression analysis revealed that among the echocardiographic parameters that were tested, the echocardiographic degree of the prolapse, anterior mitral leaflet thickness, left atrial diameter and detection of mitral regurgitation were independently associated with PWD.

Conclusion: P wave duration and PWD are increased in patients with MVP. PWD is related to the echocardiographic degree of the prolapse, anterior mitral leaflet thickness, left atrial diameter and detection of mitral regurgitation. The echocardiographic assessment may help to identify a subgroup of patients at increased risk of atrial arrhythmias.

Key words: Mitral valve prolapse, P wave dispersion, echocardiography

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Outcome of mitral valve repair in population with high incidence of rheumatic heart disease

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Background: Preserving the mitral valve (MV) apparatus by repair has widely become the preferred method of treating mitral valve regurgitation (MR). The outcome has been consistently good in mainly degenerative mitral valve disease.

Aims: We aimed to evaluate the result of MV repair using echocardiography in a population with mainly rheumatic valve diseases.

Methods: Patients were enrolled prospectively, and have been evaluated pre and postoperatively by serial echocardiographic studies.

Results: One hundred patients with MR were enrolled prospectively in the study. The mean age was 48.5±15.6 years, 56% males and 44% females. Etiology was rheumatic in 38.9%, ischemic in 23.3%, leaflet prolapse in 28%, degenerative in 4%, and endocarditis in 1%. At baseline, 80% of pat had severe MR, and 20% had moderate MR. At 12 months follow up, 88% had no or mild MR, and 9% had moderate MR, and 3% had moderately severe to sever MR. The left ventricle end systolic volume decreased from 59.3±38.7 to 88.4±38.5 ml, p<0.001. The pulmonary systolic pressure decreased from 48.9±17.5 to 37.7±8.9 mm Hg, p<0.0001.

Conclusion: MV repair can be performed successfully in different MV pathologies, including rheumatic valve disease. Left ventricular remodeling indices, and pulmonary artery pressure have improved after MV repair.

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Left ventricular function in mitral valve stenosis assessed by TDI

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Aim: Left ventricular global systolic function is accepted to be well preserved in patients with mitral stenosis (MS). There are few studies evaluating the left ventricular (LV) longitudinal function by tissue Doppler imaging (TDI) in patients with MS. Furthermore recently, isovolumic acceleration (IVA) during the contraction phase has been proposed to be useful index of myocardial contractility independent of loading conditions. Aim of our study was to assess the LV longitudinal function and LV contractility using TDI in patients with MS.

Methods: Seventy-two patients (57 female with mean age of 43±11 with mitral stenosis and 34 healthy controls (27 female with mean age of 47±12) were evaluated by echocardiography. From the tissue Doppler recordings of mitral valve septal and lateral annulus, peak systolic ejection velocity and isovolumetric acceleration (IVA) were measured. IVA was defined as the mean slope of the isovolumic contraction velocity wave (V_{a}/acceleration time, ms²).

Results: There were no statistically significant difference in left ventricular diameters between two groups. Left atrial diameter and pulmonary artery pressure were significantly higher in patients with mitral stenosis as expected. Mitral valve septal and lateral annulus S wave and IVA were also significantly lower in patients with MS.

Conclusion: LV longitudinal function assessed by S wave and contractile function assessed by IVA are impaired in patients with MS.

Table 1

<table>
<thead>
<tr>
<th>Condition</th>
<th>S wave (cm/s)</th>
<th>IVA (cm/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitral Stenosis</td>
<td>4.9±0.5</td>
<td>0.6±0.9</td>
</tr>
<tr>
<td>Control</td>
<td>4.7±0.4</td>
<td>0.6±0.9</td>
</tr>
<tr>
<td>p value</td>
<td>0.183</td>
<td>&lt;0.001</td>
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</tbody>
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Asymmetric commissural fusion and rheumatic mitral stenosis; Immediate results after percutaneous mitral commissurotomy

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Background: Normal mitral valve is characterized by equivocal bilateral commissural length. Since the main factor for success of percutaneous balloon mitral commissurotomy (PTMC) is valvular morphology and the main mechanism of balloon valvular dilation is commissural splitting, however the issue of asymmetric commisural pathology was not completely evaluated.

Objective: To determine the relation between asymmetric commisural length and immediate PTMC results in patients with rheumatic pliable mitral stenosis.

Material and methods: Twenty five patients (22 F, 3 M), mean age 44±11 year (range: 23-76) with a mean mitral valve area (MVA) of 1.0±0.1 cm² were included in this echocardiographic study. All patients were characterized by asymmetric commissural pathology in the presence of 7.9±0.7 mean echocardiographic Wilkin’s score. We excluded patients after previous surgical commissurotomy, or bilateral commissural calcification. Commisural length was measured in early diastole using parasternal short axis view from edocardial territory towards the mitral valve orifice whereas planimetric MVA calculation was undertaken. Off line measurements were collected using the Midsun functional analysis system. Commisural asymmetric index (ASI) was defined as the length of the longest fused commissure divided by the shortest one. The relation between ASI and post PTMC MVA is presented in Figure1.

Results: All PTMC procedures terminated successfully. Immediate post procedure, 22/25 (88%) had MVA of >1.5 cm² whereas only 3/25 (12%) had MVA of 1.4 cm².

Conclusion: PTMC is feasible in the presence of asymmetric commissural fusion in patients with pliable rheumatic MS. Furthermore there is no negative impact upon immediate results after this procedure.

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Validity of the right ventricular isovolumic myocardial acceleration to assess the severity of rheumatic mitral stenosis

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Objectives: To demonstrate whether the myocardial acceleration during isovolumic contraction (IVA) is a sensitive indicator of right ventricular (RV)