fracture, mitral filling pattern, deceleration time, isovolumetric relaxation time and degree of valvular regurgitation. End points were defined as cardiac death, hospitalization for worsening heart failure and peripheral embolic event. Event-free survival was analysed by Kaplan-Meier method.

Results: 172 males, 69 patients suffered an event (cardiac death=52, hospitalization for heart failure=33 and embolic event=4). In univariate analysis, normal ventricular orientation, left atrial diameter, left and right ventricular ejection fraction, mitral filling pattern, deceleration time, isovolumetric relaxation time and degree of valvular regurgitation were significantly associated with prognosis, whereas in multivariate analysis three parameters – left atrial diameter, right ventricular dimension and mitral filling pattern had independent prognostic value. In ROC curve analysis, the cut-off value was 48 mm for left atrium, 26 mm for right ventricle and restrictive filling for mitral filling pattern.

Risk groups were identified as by the absence or presence of one, two, or three risk factors. Event-free survival was 93%, 79% and 0% for no, one and two risk factors respectively.

Conclusions: In patients with DCM a risk stratification based on echocardiographic variables can successfully predict event-free survival.

709
Is Tel index the new echocardiographic golden standard for predicting the death in children with idiopathic dilated cardiomyopathy?
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Background: Tel index evaluates ventricular systolic and diastolic function. It is useful in predicting outcomes in patients with ventricular dysfunction. It remains doubtful whether it is the new golden standard predicting the death in children with idiopathic dilated cardiomyopathy (IDCM), compared to others 91 echocardiographic parameters.

Purpose: To compare Tel index as an independent marker of death with others 91 echocardiographic data in children with IDCM.

Patients: 55 consecutive patients with IDCM (13 deaths) underwent 92 echocardiographic studies from January 1996 to August 2003.

Methods: Ventricular Tel index (TVTei) were compared to echocardiographic data from dimension of cavities and derivatives functions (26 parameters), Doppler estimation of valve regurgitation (3) and pressure loss (5), mitral (19) and tricuspid (19) inflow and outflow Doppler pattern, left ventricle posterior wall motion (9), isovolumetric relaxation time, aortic acceleration velocity and right ventricular Tei index (RVTie).

The dichotomous data were evaluated by chi-square test and continuous data were evaluated by Student’s t-test and correlation by Pearson method.

Multivariate analysis by groups of variables was performed by Cox’s method. After the first step of Cox’s method, the significant variables were selected and compared with LV Tei, with grouping according by mitral regurgitation. Statistical significance done by alpha<0.05 and beta=0.80.

Results: age=33.66 years old (20 to 15.4, median=16.66 years), 24 males (43.9%), BMI 20.5% to 57.4% (10.18) and 34 black (61.8% – CI95 47.7% to 76.3%). LVTei and RVTi had a higher correlation (r=0.82, p<0.001); (43.6% - CI95 30.5% to 57.6%)(p=0.18) and 34 black (61.8% - CI95 47.7% to 76.3%). LVTei and RVTi had a higher correlation (r=0.82, p<0.001).

Conclusions: The reproducibility of measurements of left ventricular volumes and ejection fraction obtained by magnetic resonance imaging & second harmonic echocardiography in patients with ischemic heart disease L. Lipiec 1, V. Decafall 2, P. Cabrelle 3, S. Ughetto s, A. Bailly 2, N. Duray 1, L. Boyer 1, J. Ponsioen 2, 1CHU St.Jacques, Cardiology Dept., Clermont Ferrand, France; 2CHU St.Jacques, Radiology Dept, Clermont Ferrand, France; 3University Hospital, Dept of Statistics, Clermont Ferrand, France

Aim of the study: to compare the reproducibility of left ventricular (LV) volumes measurements obtained by magnetic resonance (MR) imaging and second harmonic echocardiography (SH echo).

Patients and method: 30 patients (19 males, 11 females, mean age 67±11 years) with stable ischemic heart disease underwent twice in a 24 hour interval both SH echo and True-Fast sequence MRI imaging. Left ventricular end diastolic and end systolic volumes were calculated using Simpson’s method. The intra-observer, inter-observer and inter-study variables, defined as an upper limit of 95% confidence interval of mean variances, were obtained for both imaging modalities.

Results: The cut off values of variabilities the MRI imaging and SH echo are represented in the table 1.

<table>
<thead>
<tr>
<th></th>
<th>Intra-observer variability</th>
<th>Inter-observer variability</th>
<th>Inter-study variability</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>end diastolic volume SH echo</td>
<td>20%</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>end diastolic volume MRI</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>end systolic volume SH echo</td>
<td>25%</td>
<td>24%</td>
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<tr>
<td></td>
<td>end systolic volume MRI</td>
<td>14%</td>
<td>25%</td>
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<tr>
<td></td>
<td>ejection fraction SH echo</td>
<td>8%</td>
<td>15%</td>
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<tr>
<td></td>
<td>ejection fraction MRI</td>
<td>4%</td>
<td>4%</td>
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</table>

Conclusions: 1) the reproducibility of LV volumes measurements is better with MRI imaging than that with SE echo. 2) both imaging modalities remain operator dependent in particular for the calculation of the end systolic volume.

712
Late enhancement is a marker of advanced disease progression in Fabry cardiomyopathy
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Background: It is known that some patients with Fabry disease develop late enhancement (LE) as a marker of myocardial fibrosis in the left ventricular myocardium during progression of the disease. The aim of this study was to evaluate the relationship between function abnormalities (assessed by strain imaging) and LE (assessed by magnetic resonance imaging) in a large group of Fabry patients.

Methods: 51 patients with Fabry disease (5-78 years) were included and compared to age matched controls. End-diastolic thickness of the LV interventricular septum was measured by echocardiographic M-mode. Magnetic Resonance Imaging (m=30) was performed to assess ejection fraction and potential late enhancement for the discrimination of myocardial scarring. In addition, for biventricular systolic Strain Rate (SR) was assessed to extract regional myocardial function.

Results: Women younger than 20 years had no hyper trophy, no late enhancement and normal LV radial and longitudinal function (SR longitudinal=1.7±0.5±0.1). Ten women older than 20 years had no LV hypertrophy, no late enhancement, normal radial function and normal longitudinal function in the septal wall but reduced longitudinal function in the LV lateral wall (SR–1.4±0.5±0.1). All male patients without LV hypertrophy and no late enhancement had normal radial function but longitudinal function was reduced in both the septal and lateral wall (SR–1.3±0.3±0.1).

Conclusions: Late enhancement is a marker of advanced disease progression in Fabry cardiomyopathy.
Echocardiographically guided transvenous endomyocardial biopsy: technical refinement with modern imaging techniques

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Transvenous endomyocardial biopsy (EMB) is essential for the diagnosis of certain cardiomyopathies and rejection in heart transplant patients. Traditionally, EMB is performed under fluoroscopic guidance in the catheterization laboratory. However, even exact anatomic positioning of the biopsy catheter system (biopontm) is not possible with fluoroscopy, which is also associated with radiation exposure both to the patient and operator. Two-dimensional echocardiography is a useful alternative imaging technique.

Ten patients (8 men, 2 women) with a mean age of 45±10 years underwent EMB for suspected mycardiac biopsy or restrictive cardiomyopathy (n=1) in the supine position. The biopont was introduced through the right internal jugular vein, advanced across the tricuspid valve, and directed against the interventricular septum. A cine-loop subcostal 4-chamber view (4x4 cm) with high frame rate, high harmonic imaging and high frame rates to improve endocardial border delineation, occasional malpositioning of the biopont in the inferior vena cava or coronary sinus were instantly detected. An average of 6.1±1.6 specimens were obtained at a procedure time of 11.2±1.8 minutes. The apical 4-chamber view allowed better visualization of the distal third of the right ventricle compared to the subcostal view. No procedure-related pericardial effusion or tricuspid regurgitation were detected. However, in several patients, small and highly mobile eophageic structures were detected at the biopsy site corresponding to small thrombi immediately after the procedure but not on the following day.

Subcostal 4-chamber view with biopont
Echoc-May guided transvenous endomyocardial biopsy is a safe and effective procedure without radiation exposure. Modern imaging techniques facilitate the performance and detection of complications.

Echocardiographically guided transvenous endomyocardial biopsy: technical refinement with modern imaging techniques

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The aim of the study was to assess the correlations existing between echocardiographic data (QRS width and PR length) and mechanical asynchrony in patients with dilated cardiomyopathy, in order to establish the relative place of ECG and echocardiography in the evaluation and choice of treatment (especially resynchronization therapy) for patients hospitalized with dilated cardiomyopathy (DCM).

Material and methods: 34 patients (pts), mean age 56.9±12.1 years, hospitalized in our Department between 1-11/2004 – 04/2005 with a diagnosis of DCM (44% idiopathic, 32% ischaemic, 16% ethanoic, and the rest of hypertensive etiology), with CHF class III-IV NYHA after optimal medical treatment. Every patient had an ECG with assessment of QRS width and PR length, as well as an echocardiography (performed on a GE Vivid 7 system), with evaluation of several parameters of atrioventricular, interventricular and intraventricular asynchrony.

Results: We studied two groups: group 1 = 16 pts with narrow QRS (<120 ms), and group 2 = 18 pts with wide QRS (>120 ms). The 2 groups did not differ by age, sex, DCM etiology, left ventricular global systolic function (UMP, LV volumes, aortic VTI, MPAPE, dip/dt) or magnitude of mitral regurgitation, intraventricular asynchrony parameters did not differ significantly between the 2 groups: pre-ejection time (150±47 vs 131±13 ms, p=0.06) and septal-to-posterior wall motion delay (111±60 vs 92±41 ms, p=0.07). Pts in group 2 had more severe altered LV diastolic dysfunction (more frequent restrictive pattern and a mean ratio En/Ep = 2.4±1, vs 1.9±0.5, p=0.02), as well as longer interventricular mechanical delay (49±3±6 vs 15±8±15 ms, p=0.008). Differences between the 2 groups with regard to the mechanical dispersion as measured with color tissue Doppler imaging (TDI) and pulsed wave TDI were however non-significant. 33% of pts with wide QRS did not present with mechanical asynchrony, while in group 1, 12% pts had intraventricular asynchrony and 31% pts had intraventricular asynchrony. In our group, QRS width had a good predictive value (PPV 96.8% and NPV 99%) for interventricular asynchrony, and less PPV (66.6%) or NPV (60%) for intraventricular asynchrony. PR interval length did not correlate with atrioventricular asynchrony (r=0.5, p=0.01).

Conclusions: While QRS width helps in identifying pts with intraventricular asynchrony, echocardiography remains the essential tool for evaluation atrio-ventricular asynchrony and intra-ventricular asynchrony (especially localization of late contracting segments).

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715 Recurrent acute pericarditis: diastolic function in long-term echocardiographic follow-up

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Background: The long-term outcome of recurrent acute pericarditis is not well known, and patients and physicians are often alarmed about the possible progression to the chronic disease.

Methods: Thirty-nine patients (14 women) with recurrent acute pericarditis were followed for an average of 7.7 years (range 1-43). During this period of activity we observed a mean of 2.3 episodes per patient per year (range 0-2-8). Echocardiography was performed at the time of the end of follow-up in all patients; pulsed Doppler examination of mitral and pulmonary venous inflow as well as Tissue Doppler imaging of the mitral annulus were evaluated in order to assess diastolic function. Patients were classified as normal, impaired, pseudonormal and restrictive diastolic pattern.

Results: At the end of follow-up all patients had normal systolic function (ejection fraction 0.56±0.04) and normal left ventricular volumes (end-diastolic 86±20 ml and end-systolic 33±10 ml). Twenty-five patients had normal diastolic function, 12 had impaired relaxation and 3 pseudonormal pattern; no patients developed restrictive pattern. The diastolic parameters did not correlate with number of attacks, duration of pericarditis and duration of sustained remission without therapy. Conclusions: A very long-term echocardiographic follow-up showed that patients with recurrent acute pericarditis had no evidence of cardiac dysfunction, even if the clinical course was characterised by several relapses. This reassurance may be important in the global approach to these patients.

716 Colour-coded tissue Doppler echocardiography in the follow up of patients with catheter interventional therapy (TASH) of hypertrophic obstructive cardiomyopathy (HOCM): a new tool to monitor therapy

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In pts with HOCM, a new sign of dynamic left ventricular outflow tract (LVOT) obstruction, characterized by an abrupt mid-systolic septal deceleration notch (MSSD) in the basal septal longitudinal velocity trace, was reported using colour-coded tissue Doppler imaging (TDI). Especially in challenging cases with difficult Doppler and echocardiographic examination of basal LVOT velocity, tissue Doppler imaging became an additional tool in the evaluation of disturbed LVOT function. During TASH, the LVOT gradient was reduced and the LVOT area increased. In 11 pts with persisting MSSD after TASH, compared to those without MSSD, there was a significant LVOT obstruction (from 8.7±4.6 mmHg to 4.5±2.1 mmHg, p=0.04). In addition the LVOT aortic valve area was increased (from 1.3±0.4 sq cm to 1.6±0.5 sq cm, p=0.01). Patients with persistent MSSD after TASH, had a higher septal longitudinal velocity at rest (40±10 vs 20±5), p=0.001). In 6 pts both the MSSD and LVOT gradient were eliminated after TASH. In 12 pts mid-term follow up after TASH (6 months after TASH) was performed (serial echocardiographic examinations of up to 6 examinations per pt). In all pts septal longitudinal motion was assessed by colour-coded TDI (< 100 frames/s) at rest for velocity analysis of septal longitudinal function and the identification of MSSD. Results: A pathological septal longitudinal motion at rest with a characteristic biphasic systolic velocity pattern with an early (S1) and a late (S2) positive velocity peak, interrupted by an abrupt MSSD notch was identified in all pts (100%) before TASH. After TASH a peak LVOT gradient was eliminated (from 62±43 mmHg to 38±25 mmHg), and the LVOT area increased. In 13 pts (54%) both a gradient of > 30 mmHg at rest and a pathological (longitudinal) septal motion with MSSD persisted. In 11 pts (46%) the septal longitudinal velocity trace was normalized after TASH. MSSD was not present. In 10 of these 11 pts significant LVOT obstruction at rest was eliminated (< 30 mmHg). Pts with persisting MSSD after TASH, compared to those without MSSD, had a significant higher persisting LVOT gradient at rest (Cw-Doppler 54±23 mmHg vs 20±10 mmHg). In 6 pts both the MSSD and LVOT gradient were eliminated after TASH and were both not demonstrable in the mid-term follow up. In 8 pts there was persistence of MSSD and LVOT gradient at rest (< 30 mmHg) at rest in the mid-term follow up in serial echocardiographic examinations.

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