713 Echocardiographically guided transvenous endomyocardial biopsy: technical refinement with modern imaging techniques
R.R. Brandt1, R. Arnold2, A. Elissasser3, M. Ray4, C.W. Haemmer2, D. Kröckhoff Heart Center, Cardiology Dept., Bad Nauheim, Germany; 1Krochhoff Heart Center, Cardiology Dept., Bad Nauheim, Germany; 2Krochhoff Heart Center, Cardiology Dept., Bad Nauheim, Germany

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, exact anatomic positioning of the biopsy catheter system (bioprobe) 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±4 years underwent EMB for suspected myocarditis (n=6) or restrictive cardiomyopathy (n=1) in the supraventricular position. The bioprobe was introduced through the right internal jugular vein, advanced across the tricuspid valve, and directed against the interventricular septum under guidance from the subcostal 4-chamber echo window (n=4) using harmonic imaging and high frame rates to improve endocardial border delineation. Occasional malpositioning of the bioprobe 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±1.9 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 echochogenic structures were detected at the biopsy site corresponding to small thrombi immediately after the procedure but not on the following day.

714 Is QRS width sufficient in selecting patients with intraventricular asynchrony in dilated cardiomyopathy? Echocardiographical study
R.O. Jurut1, B.A. Popescu1, R. Cludin3, M. Serban2, I. Cojocaru3, C. Gheorghe2, D. Popescu2, I. Cojocaru3
1Institute of Cardiovascular Diseases, Cardiology, Bucharest, Romania; 2Institute of Cardiovascular Diseases, Cardiology, Bucharest, Romania; 3Institute of Cardiovascular Diseases, Cardiology, Bucharest, Romania

The aim of the study was to assess the correlations existing between electrocardiographic 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). Patients with dilated cardiomyopathy (n=34 patients; mean age 56±12±1 years; hospitalized in our Department between 11/2004 - 04/2005 with a diagnosis of DCM (44% idiopathic, 35% alcohol, 21% ischaemic), were included. Material and methods: 34 patients (pts), mean age 56±12±1 years, hospitalized in our Department between 11/2004 - 04/2005 with a diagnosis of DCM (44% idiopathic, 35% alcohol, 21% ischaemic), were included. Echocardiography and 24 h Holter were performed in order to assess the correlations existing between electrocardiographic data (QRS width and PR length) and mechanical asynchrony in patients with dilated cardiomyopathy. We performed 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 (LVF: LV volumes, aortic VTI, MAFSE, dp/dt) or magnitude of mitral regurgitation. Interventricular asynchrony parameters did not differ significantly between the 2 groups: pre-ejectional velocity peak (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 severely altered LV diastolic dysfunction (more frequent restrictive pattern and a mean ratio E/e’ = 2.4±1.1 vs 1.3±0.9, p=0.02), as well as longer intermechanical ventricular delay (49.8±3.6 vs 15.8±1.5 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 interventricular asynchrony and 31% pts had intraventricular asynchrony. In our group, the width of the pre-ejectional TDI velocity peak (91.6% and NPV 99%) was predictive for interventricular asynchrony, and less PPV (66.6%) or NPV (69%) for intraventricular asynchrony. PR interval length did not correlate with ativoventricular asynchrony (r=0.36, p=0.05).

715 Recurrent acute pericarditis: diastolic function in long-term echocardiographic follow-up
A. Moreo1, B. De Chiara1, A. Brucato1, A. Alberti1, C. Munfor1, G. Brambilla2, D. Spodick1, F. Mauti1, N. Ca’ Granda Hospital, Cardiology, Bielefeld, Germany; 1Kerckhoff Heart Center, Cardiology Dept., Bad Nauheim, Germany; 2Kerckhoff Heart Center, Cardiology Dept., Bad Nauheim, Germany

The aim of the study was to assess the correlations existing between electrocardiography and presence of pericardial effusion in patients hospitalized with dilated cardiomyopathy (DCM). Patients with dilated cardiomyopathy (n=34 patients; mean age 56±12±1 years; hospitalized in our Department between 11/2004 - 04/2005 with a diagnosis of DCM (44% idiopathic, 35% alcohol, 21% ischaemic), were included. Material and 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). Echocardiographic examination was performed at 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 55±8±50 mmHg-sec and end-systolic 33±10 mmHg). 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 Color-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?
G. Beer1, O.A. Breidert2, J. Reinhardt2, T. Lawrenz1, C. Strunk-Muether2, F. Lieder1, H. Kuhn1, C. Stahlbrenner2, 1The Bielefeld Klinikum, Department of Cardiology, Bielefeld, Germany; 2University Mannheim, Department of Cardiology, Mannheim, Germany; 3The Bielefeld Klinikum, Department of Cardiology, Bielefeld, Germany

In pts with HOCM, a new sign of dynamic left ventricular outflow tract obstruction (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 angles and concomitant mitral regurgitation it seems to be helpful in the evaluation of pts with HOCM and TASH. Methods: We examined 24 consecutive pts with HOCM (12 men, 12 women; age 52±18 years; septal wall 23±4 mm; SAM septal contact in 21/24 pts) by transesophageal echocardiography and bicycle Doppler echocardiography before and after TASH. In 12 pts mid-term follow up after TASH (6 months after TASH) was performed (sequential 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 longituinal 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 peak LVOT gradient at rest (from 82±43 mmHg to 93±25 mmHg) was reduced and the LVOT area increased. In 13 pts (54%) both a gradient of - 30 mmHg at rest and a pathological longituinal motion with MSSD persisted. In 11 pts (45%) 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 (~ 30 mmHg) at rest in the mid-term follow up in serial echocardiographic examinations.

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Conclusion: In pts with HOCM and significant LVOT obstruction at rest, a pathological longitudinal septal motion with absent MSSD is identified by TDI, which normalizes after TASH and in the mid-term follow-up with successful abolition of the LVOT gradient (< 30 mmHg) at rest. The presence of MSSD obtained by TDI may contribute to new diagnostic tool for gradient characterization and therapy monitoring of TASH and also during follow up.

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Age-related haemodynamic differences in patients undergoing alcohol septal ablation for obstructive hypertrophic cardiomyopathy: a mid-term follow-up
J. Veselka 1, R. Duchonova 1, S. Prochazkova 1, J. Palenickova 1, D. Tesar 2.
1 University Hospital of Motol, Dept. of Cardiology, Prague, Czech Republic; 2Hospital Motol, Dept. of Imaging Methods, Prague, Czech Republic

Background: Alcohol septal ablation (PTLSMA) decreases left ventricular outflow gradient (LVOG) and relieves symptoms in patients with highly symptomatic hypertrophic obstructive cardiomyopathy (HOCM). The aim of this study was the evaluation of the age-related early course of haemodynamic changes after PTLSMA.

Methods: Forty-four consecutive patients 28 females, age 54±13 [24-81] years, underwent PTLSMA procedure for symptomatic HOCM. Clinical and echocardiographic data were obtained at baseline and periodically up to 12 months after PTLSMA. Patients were divided into three age-related groups. Group 1 comprised 14 pts. [24-48] years, group 2 comprised 14 pts. [49-60] years and group 3 comprised 16 pts. [61-81] years.

Results: Among all 44 patients ethanol was injected into 48 septal branches. The volume of alcohol injected was 2.3±0.6 mL (p < 0.001) with subsequent peak of CK-MB 3.0±2.4 µkat/L (normal range of CK-MB is up to 0.45 µkat/L). Decrease of LVOG was identified in all age-related groups of patients (p < 0.001) (Fig. 1 shows log LVOG). After multivariate analysis, there was a significant influence of age (p < 0.003) and CK-MB peak (p = 0.016) on the course of LVOG reduction. Older patients and a higher postprocedural CK-MB peak were associated with earlier reduction of left ventricular obstruction. The influence of the presence of pacing at baseline, gender and left ventricular ejection fraction after procedure was not significant.

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Apical hypertrophic cardiomyopathy: diagnosis with real time myocardial contrast echocardiography
A. Theopaulou, G. Roussou, A. Pispoukou, C. Aggel, A. Arastasakis, N. Marais, C. Hatzos, C. Stefanadis. University of Athens, 1st Cardiology Dpt, Hippokratio Hospital, Athens, Greece

The echocardiographic diagnosis of apical hypertrophic cardiomyopathy (ACM) has been limited by the frequent inability to visualize the apical endocardium so that expensive or invasive diagnostic tests are usually necessary to obtain a diagnosis. We hypothesized that contrast echocardiography, in particular myocardial perfusion imaging, may be the technique of choice for the diagnosis of ACM. We aimed to study the diagnostic accuracy of myocardial contrast echocardiography in 2 pts whereas in the remaining 4 cases magnetic resonance imaging (MRI) was the haemodynamic improvement slower than in elderly patients.

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Predictors of gadolinium hyperenhancement based on echocardiography in hypertrophic cardiomyopathy. Value of strain measurements
D.R. Saure Espin 1, V. Climent 2, D. Gonzalez 3, E. Fellu 3, A. Romero 3, F. Marin 3, E. Paya 4, M. Vaides 5, 1Murcia, Spain; 2Hospital General Universitario, Department of Cardiology, Alicante, Spain; 3Hospital Virgen de la Arrixaca, Department of Cardiology, Murcia, Spain

Despite normal systolic function, myocardial fibrosis has been demonstrated in patients with hypertrophic cardiomyopathy. New tissue Doppler-based measurements (strain and strain rate) provide better insights into myocardial regional characterization.

We aimed to study relations between gadolinium hyperenhancement (GH) in cardiac magnetic resonance (CMR) and echocardiography (echo).

Methods: 36 (27 male, aged 47±15) consecutive patients with hypertrophic cardiomyopathy underwent gadolinium-enhanced CMR and echo with strain measurements. GH in segments (8.2 segments per patient) were available for both echo and CMR analysis. Apical segments were not evaluated. Patients with implanted devices were excluded.

Results: Maximal left ventricular wall thickness (MLVWT) was 20.1±4.8 mm. 11 (31%) had significant LVOT obstruction. 69% were in NYHA functional class I. 16% had non-sustained ventricular tachycardia on Holter. 42% had none, 33% had one, and 25% had ≥1 risk factors for sudden death. 23 (64%) patients had positive GH in CMR. MLVWT in mm was predictor of positive GH (OR: 1.47, 95%C.I.:1.01-1.98, p = 0.04). There was a trend between septal strain and quantitative measurement of global GH (r:0.39, p = 0.07). There was no association between septal strain rate and septal thickness or global GH. Segmental analysis failed to show relation between wall thickness, strain, strain rate, and global GH.

Conclusions: Maximal left ventricular wall thickness on echo is a good predictor of global gadolinium hyperenhancement on CMR in patients with hypertrophic cardiomyopathy. Association between strain and GH on CMR merits further investigations.

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Correlation between left ventricular mass and the parameters characterizing the left ventricular diastolic function in patients with hypertrophic cardiomyopathy

In patients with hypertrophic cardiomyopathy (HCM) left ventricular (LV) mass seems to be an important factor influencing the diastolic function. The aim of our study was to investigate the relationship between LV mass and the parameters of the global LV diastolic function determined by conventional and tissue Doppler echocardiography and cardiac magnetic resonance imaging (CMR). Left atrial volume which has been suggested as a marker of the diastolic dysfunction's severity was also measured. Patients: 34 consecutive patients with HCM (24 male, 10 female, mean age 49±14 years) were studied. Inclusion criteria were: normal sinus rhythm, ejection fraction ≥ 50%.

Methods: In addition to the conventional transmitral flow patterns – early (E) and late diastolic (A) velocities, deceleration time (DT), isovolumic relaxation time (IVRT) – myocardial early (Em) and late diastolic (Aa) velocities were measured at the lateral border of the mitral annulus by ATL HDI 5000 ultrasound system. E/a and E/A ratios were calculated. Maximal left atrial volume (Vmax) was