volumetric relaxation time (IVRT), isovolumetric contraction time (IVCT), and Ea
time (Pet) were measured from the parasternal short axis view. Tricuspid E-wave
were abbreviated to achieve >90% ventricular pacing at an optimal AV interval for
diography, TDE were performed at baseline. After than, atrioventricular delay (AV)
within previous 6 months (16% of VDD mode, 84% of DDDR mode) were included
short term cardiac pacing on right ventricular (RV) functions.

Tissue Doppler echocardiography (Vivid 7, GE), an ESM and BNP dosage on
A. Den jean 2.

687 Assessing right ventricular flow velocities before and after short term
pacing by tissue Doppler echocardiography
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Purpose: Tissue Doppler echocardiography (TDE) provides a quantitative analysis of
myocardial function. The aim of the present study was to investigate the effects of
short term cardiac pacing on right ventricular (RV) functions.

Method: Eighty patients with dual chamber pacemaker or defibrillator were eval-
uated. Twenty-five patients (mean age 64±11 years, 9 female with >20% pacing
within previous 6 months (16% of VDD mode, 84% of DDDR mode) were included
in the study. In the non paced state TDE were performed in all patients. Doppler
echoangiography, TDE were performed at baseline. After than, intraventricular delay (AV)
were abbreviated to achieve >90% ventricular pacing at an optimal AV interval for
4 hours. After 4 hours long AV delay that achieved >90% sensing was chosen and
TDE were performed at the parasternal short axis view. Tricuspid E-wave velocity (E),
A-wave velocity (A), tricuspid regurgitation, tricuspid annulus area, Doppler velocities systole (S), early (Ea), and atrial (Aa), S velocity duration, iso-
 volumetric relaxation time (IVRT), isovolumetric contraction time (IVCT), and Ea
deceleration time (e'27) were measured at the free wall from apical 4 cham-
per view. All the parameters were measured at baseline and after pacing for
4 hours pacing. Continuous variables are expressed as means ± standard error.

Results: The conventional and tissue Doppler measurements at baseline and after
pacing were similar except A wave. Immediately after pacing P (61.6±4.2 cm/s
vs. 62.9±4.4 cm/s, p = 0.85) and E (47.8±2.4 cm/s vs. 48.6±3.2 cm/s, p = 0.91)
wave velocities were not altered. P e (324.1±6.8 ms vs. 306.6±9.7 ms, p = 0.08)
was nonsignificantly reduced. TDE systolic parameters before and after pacing
were measured as fellows; S: 167.5±10.2 mm/s vs. 169.9±9.4 mm/s, p = 0.62 and S velocity duration 224±6.2 ms vs. 223±7.3 ms, p = 0.83, and IVCT
65.4±5.1 ms vs. 80.7±6.8 ms, p = 0.07). The diastolic parameters of RV were
impaired slightly after pacing (A; 47.3±2.5 cm/s vs. 51.6±2.2 cm/s, p = 0.04, Ea
14.1±3.4 cm/s vs. 15.1±7.0 cm/s, p = 0.07, Ea 21.3±11.4 cm/s vs. 22.4±6.2 cm/s,
p = 0.34)

Conclusion: Short-time pacing seems to have no effects on RV systolic function
parameters, but have a minimal adverse effect on RV diastolic functions.

688 Abnormal left ventricular longitudinal contractile reserve in the presence
of normal ejection fraction at rest in patients with apical hypertrophic
cardiomyopathy
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Background: Apical hypertrophic cardiomyopathy (ApHCM) is a unique form of
hypertrophic cardiomyopathy, in which the hypertrophy of myocardium predomi-
nately involves the apex of the left ventricle (LV). In patients with ApHCM, global
LV systolic function appears normal when assessed with conventional radial con-
trast parameters, such as fractional shortening or ejection fraction (EF). LV lon-
gitudinal contraction results in apical displacement of the mitral annulus and it can
be quantified using pulsed wave tissue Doppler imaging. We hypothesized that
total annular systolic velocity during exercise would be abnormal in patients with
ApHCM.

Methods and Results: Seiptal mitral annular systolic velocity (S') was measured
at rest and during graded supine bicycle exercise (25W, 3 minutes increments)
in 53 patients (37 male, mean age 58 years) with ApHCM and 52 patients (19
male, mean age 56 years) with control. LV EF was calculated from the echocar-
diographic m-mode from short axis image. LVEF and S' at rest were not differ
significantly between the groups (EF, 70.6±6.26%, p=0.06; S', 6.1±1.3 vs
S' in controls, 10.2±2.3%, p<0.0001.

Conclusion: Significant abnormality was found in the systolic function of the
apical mitral annulus in patients with ApHCM.
Hypertrophy can involve the left (LV) and/or the right (RV) ventricle. The diagnosis of HOCM because longitudinal septal motion by TDI can be easily evaluated during diastolic filling and systole. The LV systolic septal motion was normal without a MSSD. After provocation, a characteristic systolic deceleration notch (S') was noted, which was associated with a significant change in LV diastolic filling. This was measured for both septal and non-septal regions. To investigate regional RV function, the RV free wall was divided into its morphological segments: apical, mid, and basal. The RV free wall showed pronounced regional impaired systolic deformation, despite conventional methods showing normal systolic function. This suggests that TDI can detect subtle changes in RV/LV function with consequences for differential diagnosis, prognosis, and therapy in pts with the clinical features of HCM and might help to distinguish HCM clinically from other cardiac disorders mimicking its clinical features.

**Methods:**

The study population included 123 HCM patients (39.4 ± 5.9 years) and 110 age- and sex-comparable healthy subjects, followed up for 48.4 ± 10.6 months. By use of pulsed DMI, in 6 different basal septal segments were measured: symptomatic peak velocities and systolic time intervals; myocardial peak velocities and systolic time intervals; and homogeneous systolic deformation. During the follow-up, 33 cardiac deaths (12 sudden deaths) were observed. By Cox proportional-hazards regression analysis, family history of sudden cardiac death (Hazard Ratio: 2.51; 95% CI: 1.3-4.6; p < 0.0001), and DMI intra-V delays (Hazard Ratio: 3.6; 95% CI: 1.4-4.3; p < 0.000) were the only independent predictors of sudden cardiac death. The global chi-square of this combined variable was significant (Hazard Ratio: 2.51; 95% CI: 1.3-4.6; p < 0.0001). DMI Intra-VDel (Hazard Ratio: 3.6; 95% CI: 1.4-4.3; p < 0.0001) were the only independent predictors of sudden cardiac death. The global chi-square of this combined variable was significant (Hazard Ratio: 2.51; 95% CI: 1.3-4.6; p < 0.0001).

**Conclusions:**

In HCM patients, DMI indices of Intra-VDel may provide additional information for selecting subgroups of HCM patients at increased risk of ventricular arrhythmias and sudden cardiac death at follow-up. Accordingly, such patients may be more actively identified for early intensive treatment and surveillance.

**CARDIOMYOPATHY/PERICARDIAL DISEASE**

**Regional right ventricular systolic function in patients with hypertrophic cardiomyopathy (HCM): a study using strain and strain rate imaging**

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HCM is a genetically transmitted heart disease due to mutations of the cardiac sarcomeric proteins. The phenotype is highly variable and may involve retardation of growth, deafness and mental retardation. Only very few case reports about this cardiocutanous syndrome are available. Methods: We investigated 29 pts with HCM (mean age 37.1 ± 12.8 years; range 16-60 years) regarding regional RV function. Standard transthoracic echocardiographic (TTE) examinations were performed in all pts. Additionally, colour-coded Tissue Doppler echocardiography was performed in all pts. To evaluate regional RV function, the RV was divided into its morphological segments: basal, mid, and apical. Longitudinal deformation was measured for all segments. The deformation data were compared to age- and sex-matched normal controls. Results: In all pts, regional RV deformation was reduced compared to normal controls. In particular, the systolic deformation at the apical segment was significantly reduced (p < 0.001). In 4 pts with unobstructed RV function by conventional methods, deformation was even further reduced (systolic: basal -12%, apical -27%; diastolic: basal -17%, apical -33%). Conclusions: Tissue Doppler echocardiography may help to distinguish HCM clinically from other cardiac disorders mimicking its clinical features.

**Serial strain echocardiographic investigations in progressive cardiomyopathic tachycardia: a cardiocutanous syndrome characterized by progressive hypertrophic obstructive cardiomyopathy (HOCM)**

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In 1072 Polish and 400 Italian patients, respectively, a syndrome of progressive cardiomyopathic tachycardia (PCL) consisting of alterations of skin pigmentation (multiple symmetrical lentigines) and progressive HOCM which involves the left (LV) and right (RV) ventricle and the tricuspid and mitral valves, was described. This syndrome is highly variable and may involve retardation of growth, deafness and mental retardation. Only very few case reports about patients with this syndrome are available. Methods: We investigated 29 pts with HCM (mean age 37.1 ± 12.8 years; range 16-60 years) regarding regional RV wall motion, diastolic filling, and systolic deformation. Regional RV deformation was reduced compared to normal controls. In particular, the systolic deformation at the apical segment was significantly reduced (p < 0.001). In 4 pts with unobstructed RV function by conventional methods, deformation was even further reduced (systolic: basal -12%, apical -27%; diastolic: basal -17%, apical -33%). Conclusions: Tissue Doppler echocardiography may help to distinguish HCM clinically from other cardiac disorders mimicking its clinical features.