Bedside Poster

432 Hypertensive left ventricle: different remodeling - different longitudinal function.

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The Abstract

Background: Left ventricle (LV) longitudinal function in systemic hypertension may be reduced, while radial function remains normal, or even may show compensatory increase. LV remodeling is important factor in the progression to congestive heart failure. Based on LV mass indexed for body size and relative wall thickness (RWT), LV remodeling in hypertension can be characterized by geometric subtypes with different prognosis.

Aim: Aim of the study was to determine the longitudinal LV function in the different types of hypertensive LV remodeling.

Methods: Pulsed tissue Doppler imaging was performed in 132 patients (72 male, 57.2Â±11.3 years) with essential hypertension. Mitral annular velocities were measured lateral and septal from apical 4-chamber view, anterior and inferior from 2-chamber view. Systolic (Vs), early (Ve) and late (Va) diastolic annular velocities were averaged from the four sites.

45 patients were with eccentric hypertrophy (normal RWT and LV hypertrophy), 32 patients with concentric hypertrophy (increased RWT and LV hypertrophy), 22 patients with concentric remodeling (increased RWT and normal LV mass) and 33 patients - with normal LV mass and RWT.

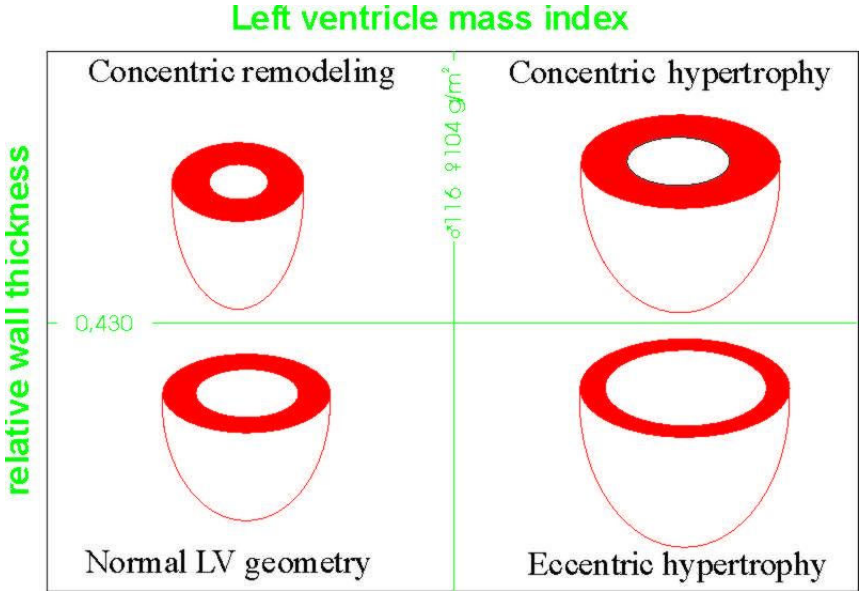
Results: Table I

Conclusion: Longitudinal LV function differs in the types of LV remodeling in essential hypertension.

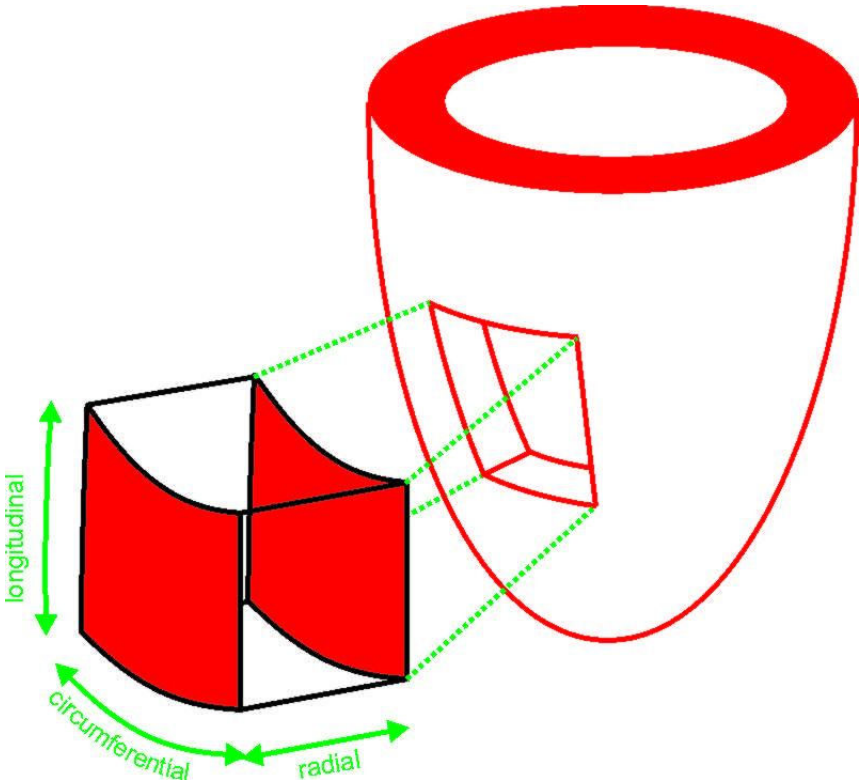
Objective

Background: Left ventricle (LV) longitudinal function in systemic hypertension may be reduced, while radial function remains normal, or even may show compensatory increase. LV remodeling is important factor in the progression to congestive heart failure. Based on LV mass indexed for body size and relative wall thickness (RWT), LV remodeling in hypertension can be characterized by geometric subtypes with different prognosis (figure 1).
Aim of the study was to determine the longitudinal LV function in the different types of hypertensive LV remodeling (figure 1 and 2).

Fig 1. LV geometric patterns in systemic hyperetension:



Annotation: Fig 1. LV geometric patterns in systemic hyperetension



Annotation: Fig 2. LV function can be studied in longitudinal, circumferential and radial directions.

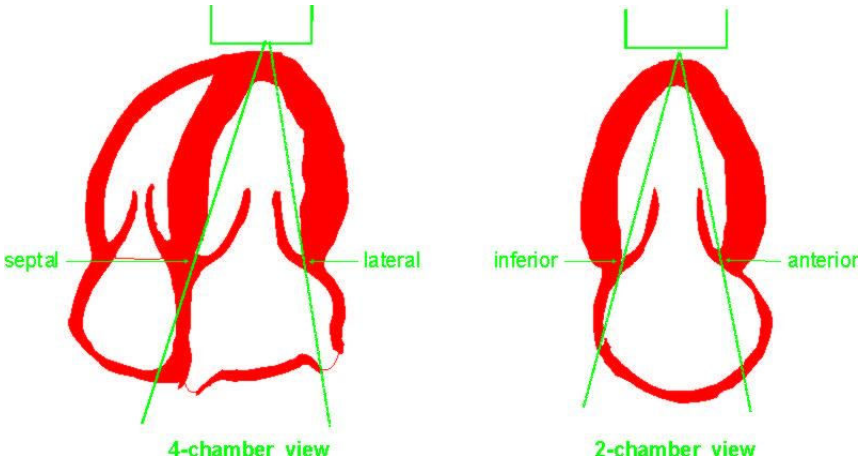
Fig 2. LV function can be studied in longitudinal, circumferential and radial directions.

Methods and Materials

Methods: Pulsed tissue Doppler imaging was performed in 132 patients (72 male, 57.2±11.3 years) with essential hypertension with Philips Sonos 5500, software version B2 with S3 transducer (table I).

Table I. Preset for pulsed tissue Doppler for Sonos 5500
TCE1
power - 0.0 dB
doppler gain - 30%
doppler filter - 50 Hz
colorize - sepia
gate length - 0.56 cm
compress - 5, reject - 8
sweep speed - 50 mm/sec
scale +/- 20 cm/sec
temporal smooth (Setup) - 3
velocity smooth (Setup) - 5.

Mitral annular velocities were measured lateral and septal from apical 4-chamber view, anterior and inferior from 2-chamber view (figure 3 and 4). Systolic (Vs), early (Ve) and late (Va) diastolic annular velocities were averaged from the four sites.



Annotation: Fig 3. Places for pulsed tissue Doppler registration.

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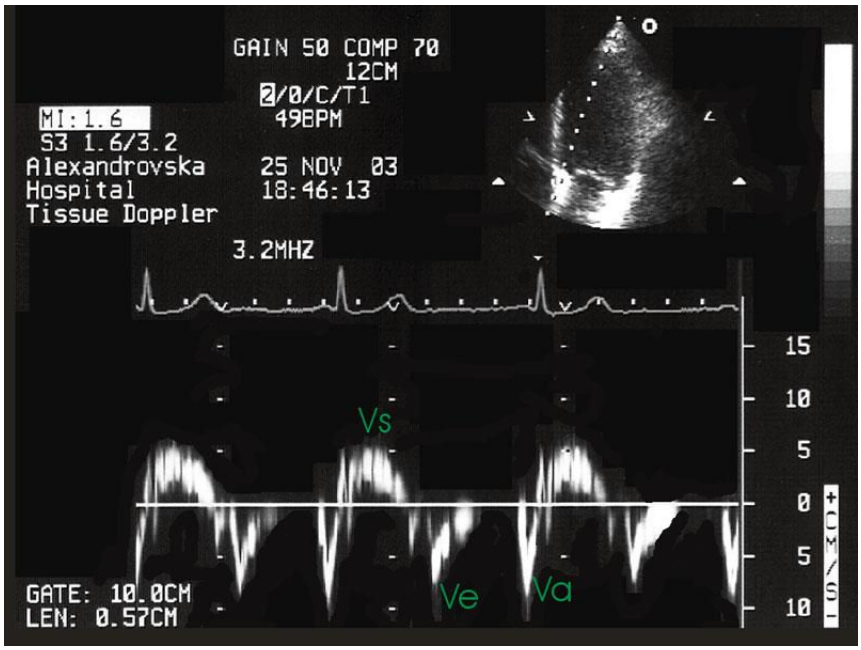

Annotation: Fig 4. Vs, Ve and Va were measured.

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RWT of the LV was expressed as the ratio of twice the posterior wall thickness to the end-diastolic cavity dimension. Increased RWT was present when this ratio was >0.430. LV hypertrophy was considered present when LV mass/body surface area was >116 g/m^2 for men and >104 g/m^2 for women.

Patients

45 patients were with eccentric hypertrophy (normal RWT and LV hypertrophy), 32 pts with concentric hypertrophy (increased RWT and LV hypertrophy), 22 pts with concentric remodeling (increased RWT and normal LV mass) and 33 pts - with normal LV mass and RWT.

Results

Results:

	Vs (cm/s)	Ve (cm/s)	Va (cm/s)
Eccentric hypertrophy	8,1±2,9*#	9,1±2,3*#	10,9±3,3
Concentric hypertrophy	6,9±2,2*	7,8±1,7*	11,1±4,2
Concentric remodeling	8,9±3,1#	9,0±1,9*#	12,5±2,0
Normal LV geometry	9,8±2,4	11,2±2,5	12,9±2,9

* p<0,05 vs normal geometry; # p<0,05 vs concentric hypertrophy

Conclusion

Conclusion: Longitudinal LV function differs in the types of LV remodeling in essential hypertension.

References

References:
1. Wachtell K., Dahlöf B., Rokkedal J. et al.: Change of left ventricular geometric pattern after 1 year of antihypertensive treatment: The Losartan Intervention for Endpoint Reduction in Hypertension (LIFE) Study Am Heart J 144(6):1057-1064, 2002
2. Lorell B. H., Carabello B. A. Left ventricular hypertrophy: pathogenesis, detection, and prognosis. Circulation. 2000;102:470-479.

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Subtopics

19.04 - The heart in hypertension
4.01 - Systolic function
4.02 - Diastolic function
