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Assessment of left atrial appendage wall velocities in patients with stroke.

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The left atrial appendage (LAA) is an important source of systemic embolic events. The purpose of this study was to evaluate the LAA function with tissue Doppler echocardiography and compare them with the classical LAA function parameters especially in patients with spontaneous echo contrast.

To assess left atrial appendage (LAA) wall velocities, 115 stroke patients underwent tissue Doppler echocardiography during a clinically indicated transesophageal echocardiography procedure. The LAA flow velocity, LAA minimum and maximum areas, LAA orifice size, LAA flow propagation velocity and mitral flow propagation velocity (MFPV) were also evaluated.

Results: Patients with spontaneous echo contrast (37 patients) have higher LAA min (3.3 ± 1.0 vs 1.8 ± 0.9 , $p=0.0001$) and max areas (5.7 ± 2.3 vs 3.7 ± 1.2 , $p=0.0001$) and lower left atrial appendage flow velocity (just before the QRS complex) (0.5 ± 0.2 vs 0.3 ± 0.1 , $p=0.001$). Tissue Doppler derived LAA outflow positive wave just before the onset of QRS complex (LAAa) is lower in patients with SEC (4.7 ± 2.2 vs 9.3 ± 3.6 , $p=0.0001$) but the negative wave just after the onset of QRS complex (LAAb) and the positive wave before the electrocardiographic P wave (LAAp) are not significantly different between patients with and without SEC, $p>0.05$. LAAa is correlated with LAA flow velocities but the LAAb and LAAp does not correlate. Patients with lower LAAa have larger LAA areas (For LAA min: $p=0.001$, $r=-0.4$, for LAA max: $p=0.006$, $r=-0.38$) and lower LAA flow velocity ($p=0.004$, $r=0.34$). MFP velocity is only correlated LAAp ($r=0.32$, $p=0.005$).

Conclusions:

- 1) From the left atrial appendage wall velocities the outflow positive wave just before the onset of QRS complex (LAAa) is more useful clinical parameter for the evaluation of patients with spontaneous echo contrast
 - 2) Patients with spontaneous echo contrast have lower LAA wall velocity
 - 3) Left atrial appendage wall velocity is correlated with LAA flow velocity.
 - 4) The positive wave before the electrocardiographic P wave may be related with the left ventricular diastolic functions.
- Thus, conventional TEE examination with the integration of tissue Doppler analysis can be useful for a comprehensive assessment of left atrial appendage function.

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Left ventricular hypertrabeculation/noncompaction is not associated with stroke or peripheral embolism.

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Since its first description left ventricular hypertrabeculation/noncompaction (LVHT) is reported to be associated with embolism. Aim of the study was to assess the number of stroke or embolism in LVHT patients and in control patients matched with regard to age, sex and left ventricular systolic function.

Design, Setting, Patients and Results: Included in this retrospective study were patients in whom LVHT was diagnosed echocardiographically between 1995-2002. The control group comprised age-, sex-, and left ventricular fractional shortening matched patients who had undergone echocardiography between July and September 2002. Both groups of patients were contacted by telephone between October and December 2002 and were asked if they have ever suffered from stroke or peripheral embolism. Among the 62 patients with LVHT (14 female, 48 male, mean age 53 years, left ventricular fractional shortening 6–53%) 5 patients had suffered from stroke and 1 patient from peripheral embolism during their lifetime. Among the 62 control patients (14 female, 48 male, mean age 54 years, left ventricular fractional shortening 6–48%) 9 patients had suffered from stroke during their lifetime.

Conclusions: This study shows that strokes or peripheral embolic events are not increased in patients with LVHT when compared with age-, sex-, and left ventricular fractional shortening-matched controls. LVHT by itself does not seem to be a risk factor for stroke or embolism and thus, not an indication for oral anticoagulation.

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Importance of transesophageal echocardiography for detection of cardiac source of embolism according to age groups.

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Background: Transesophageal echocardiography (TEE) is a very useful diagnostic tool to identify cardiac source of systemic embolism. Is the diagnostic capacity and the identified anomalies detected the same for different age groups?

Objectives: We sought to evaluate the diagnostic capacity and the findings detected by TEE in the search for a cardiac source of systemic embolism according to age.

Population and Methods: Retrospective analysis of 771 consecutive patients submitted to TEE from 1994 to 2003 to exclude cardiac embolic source. Patients were divided into 3 groups: Group I: <50 years ($n=324$, 39 ± 8 years, 46% males); Group II: 50-74 years ($n=392$, 61 ± 7 years, 55% males); Group III: ≥ 75 years ($n=54$, 78 ± 3 years, 33% males). We evaluated the type of embolic phenomenon, the presence of spontaneous echo contrast (SC) or thrombi in left atrial appendage and/or left

atrium, atrial septum defect (ASD), atrial septum aneurysm (ASA), patent foramen oval (PFO), prominent plaques in the thoracic aorta, mitral valve disease, valvular endocarditis and intra-cardiac tumours.

Results: There were strokes in 73, 77 e 74% of patients ($p=NS$), transient ischemic attacks in 22, 15 and 11% ($p=0.03$ for Group I vs. II) and peripheral embolism in 6, 8 and 15% of patients ($p=0.04$ for Group I vs. III), respectively. The findings are reported in the table ($*p<0.05$, GI vs GII or GIII, GII vs GIII).

n (%)	Group I	Group II	Group III
ASD	3 (0.9)	4 (1)	0
PFO	23 (7)	44 (6)	3 (6)
ASA	19 (6)	27 (7)	1 (2)
Thrombi	13 (4)	44 (11)	4 (7)
SC*	11 (3)	66 (17)	14 (26)
Aortic plaques*	13 (4)	74 (19)	24 (44)
Positive*	85 (26)	195 (50)	35 (65)
≥ 2 embolic sources*	1 (0.3)	18 (5)	9 (17)

Results

Conclusions: There was a better diagnostic capacity of TEE in elderly patients, where there was frequently an association between several potentially embolic sources. Spontaneous echo contrast and prominent aortic plaques were the predominant findings in patients above 50 years of age.

VALVULAR HEART DISEASE

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Prevalence of diastolic dysfunction in patients with aortic stenosis and preserved left ventricular systolic function.

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Purpose Historical data suggest that approximately 50% of patients with aortic stenosis (AS) and normal systolic function have evidence of diastolic dysfunction. These data predate the identification of several novel echocardiographic indicators of impaired left ventricular (LV) relaxation and increased LV filling pressures. These include early mitral annulus velocity (e'), ratio of early diastolic filling velocity to early mitral annulus velocity (E/e') and left atrial volume indexed for body surface area (LAVi). We hypothesised that the combination of these parameters and traditional methods would identify a higher prevalence of diastolic dysfunction than previously reported.

Methods Transthoracic Doppler echocardiography was performed in 63 patients (age 65 ± 12 years) with AS (mean gradient 27 ± 12 mmHg; aortic valve area (AVA) 1.1 ± 0.4 cm²). Patients with atrial fibrillation, greater than mild mitral regurgitation or LV systolic dysfunction were excluded. Diastolic function was assessed by measurement of transmitral E- and A-wave velocity, E-deceleration time (DT), isovolumic relaxation time (IVRT), Doppler tissue imaging of the early septal mitral annulus velocity (e') and LAVi. Mean and peak aortic valve gradients, AVA and LV mass indexed for body surface area (LVMI) were recorded. E/A ratio >2 , DT <150 ms, E/e' ratio >15 or LAVi >32 mL/m² were considered indicative of increased LV filling pressures. E/A ratio <0.7 and/or DT >240 ms and/or IVRT >90 ms and/or e' <5 cm/s were considered indicative of impaired relaxation.

Results 30 patients (48%) had evidence of elevated LV filling pressures: E/A ratio >2 in 1 (1%), DT <140 ms in 2 (3%), E/e' >15 in 20 (32%), and LAVi >32 mL/m² in 11 (17%). An additional 19 patients had evidence of impaired relaxation. In total, therefore, 49 patients (78%) had evidence of diastolic dysfunction. There were no significant univariate correlations between severity of AS and E/A ratio, DT, IVRT and LAVi. There were, however, weak correlations between peak and mean aortic valve gradients and e' ($r=-0.26$, $p=0.05$ and $r=-0.29$, $p=0.02$) and E/e' ratio ($r=0.31$, $p=0.02$ and $r=0.32$, $p=0.01$). LVMI did not correlate with E/A ratio, DT, IVRT or severity of AS. However, LVMI did correlate significantly with e' ($r=-0.32$, $p=0.01$), E/e' ratio ($r=0.32$, $p=0.02$) and LAVi ($r=0.49$, $p<0.001$).

Conclusions At least 78% of patients with AS and preserved LV systolic function have some evidence of diastolic dysfunction and almost 50% have evidence of elevated LV filling pressures. LVMI is inversely correlated with e' velocity and directly with E/e' ratio and LAVi.