838 Direct measurement of left ventricular outflow tract by newly developed transcranial real-time 3D-echoangiography increases accuracy in assessment of aortic valve stenosis.
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Background: Evaluation of aortic valve stenoses is one to the most important current clinical applications of echocardiography. The widely employed continuity equation requires measurement of the left ventricular outflow tract (LVOT) area. We aimed at investigating whether direct measurement in a volume data set is superior to conventional calculation from the LVOT-diameter.

Methods: We performed left ventricular outflow tract measurement in 20 normal subjects and 15 patients with moderate to severe aortic stenosis with a newly developed transcranial real-time three-dimensional echocardiography technique (SONOS 7500, Philips, Best, Netherlands). The off-line 3D-education software (TomTec, Munich, Germany) allows free choice of section plains within the acquired volume data set. The aortic valve area was calculated by two independent observers according to the continuity equation from the mean of LVOT area values as determined from several sequential systolic frames. These results were compared to area estimates obtained by M-mode LVOT-diameters (area = $\pi (d/2)^2$). Additionally the sonographically calculated aortic valve orifices were compared to direct planimetry by transesophageal examination or invasive measurements.

Results: In all cases both observers found a significant reduction in LVOT-area during systole (p<0.01). Frequently, the contraction of the LVOT resulted in an elliptical shape, as underscored by a significant decrease of the longitudinal/transverse axis ratio (p<0.01). Determination of aortic valvular orifice deviated less than from invasive or planimetrically measured values (mean difference: 0.04cm 2) than conventionally calculated LVOT-areas based on M-mode (mean difference: 0.16cm 2).

Conclusion: The transcranial real-time 3D-echoangiography technique offers better estimates of aortic valve area, approximating planimetric and invasive measurements, as compared to application of the continuity equation to conventional M-mode echocardiography.

839 Can plasma NTproBNP assess right ventricular overload in patients with acute pulmonary embolism?
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Objective: Right ventricular (RV) dysfunction can be echocardiographically detected in half of pts with acute pulmonary embolism (APE). Plasma NTproBNP was released upon myocardial stretch reflects left ventricular dysfunction in congestive heart failure. Therefore we assessed if NTproBNP relates the degree of RV overload in APE.

Material and Method: We investigated 74 pts (27M, aged 63±17 years) with proven APE. On admission blood samples were collected for NTproBNP assay (Roche, ECLIA) and TTE was performed for the determination of RV overload.

Results: APE group comprised 54(73%)pts with RV overload (RV+) defined by RV/LV <0.6 and/or TVPG>30mmHg with acceleration time of pulmonary ejection >80ms, while 20(27%) others showed no alteration in RV morphology or function (RV-). Plasma NTproBNP was significantly lower in RV- than in RV+ (median 133pg/ml (range: 66-1095pg/ml) in RV- vs. 410pg/ml (range: 157-1631pg/ml) in RV+ , p<0.001). Significant correlations between echocardiographic indices of RV overload and NTproBNP were found (table).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Plasma NTproBNP (pg/ml)</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV/LV</td>
<td>0.53</td>
<td>0.49</td>
<td>&lt;0.001</td>
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<tr>
<td>TPG (mmHg)</td>
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<td>0.38</td>
<td>&lt;0.001</td>
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<tr>
<td>RV (mmHg)</td>
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<td>RV EF</td>
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<tr>
<td>RV mitral S'</td>
<td>p&lt;0.003</td>
<td>p=0.003</td>
<td></td>
</tr>
<tr>
<td>RV E'</td>
<td>p=0.03</td>
<td>p=0.01</td>
<td></td>
</tr>
<tr>
<td>RV A'</td>
<td>p=0.08</td>
<td>p=0.008</td>
<td></td>
</tr>
</tbody>
</table>

Correlation between NTproBNP and echocardiographic-indices of RV overload.

Conclusion: Plasma NTproBNP is superior to echocardiographic-indices of RV overload in pts with acute pulmonary embolism.

Moreover, ROC curve analysis revealed that plasma NTproBNP >200pg/ml showed 98% sensitivity and 55% specificity for the detection of RV overload.

840 Mechanism and prevention of tricuspid regurgitation in patients transplanted according to the biatrial anastomosis technique: an echocardiographic study on 150 patients
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Background: Tricuspid regurgitation (TR) is a common post-transplant complication, especially after biatrial anastomosis. We investigated the mechanism of TR development after biatrial anastomosis in order to prevent this complication.

Methods: 150 patients with biatrial anastomosis (post-transplant times: 1-12 years) underwent comprehensive echocardiographic assessments, including morphological and functional tricuspid valve (TV) evaluations, right atrial (RA) geometry measurements, and measurements of the tricuspid annulus (TA) systolic excursion and tissue Doppler wall motion velocity at different levels of the TA and atrial anastomosis, in addition to invasive hemodynamic evaluations.

Results: Patients with TR equal or higher than grade I had higher RA anterior wall donor/recipient (D/R) length ratios than those without TR (1.03 ±0.13 vs. 0.80 ±0.16; p=0.0011) and in those without TR the RA anterior wall D/R ratios were lower than the D/R ratios at the intestinal septum (p=0.001). The RA anterior wall D/R ratios were predictive for post-transplant TR. With D/R ratios <1, the probability of TR was only 2.2%, whereas for D/R equal or higher than 1.1 the probability of TR reached 91.7%. We found a positive correlation between D/R ratios and TR intensity (p<0.01; r=0.69). The ratio between the systolic excursion of the anterior and septal TA was higher in patients without TR than in those with TR (p=0.003). The negative correlation (r= -0.56; p<0.01) found between the RA anterior wall D/R ratios and the TA anterior/septal systolic excursion ratios suggests that TA systolic excursion is highly dependent on the ratios between the length of different wall segments. We also found a negative correlation (p<0.01; r= -0.58) between the anterior/septal systolic excursion ratios and TR. The higher tension of the RA anterior wall in comparison to the septal wall in patients with D/R <1 and the lower tension at the anterior RA wall in patients with D/R ratios >1 was proven by tissue Doppler wall motion velocity measurements. We found no significant correlation between pulmonary artery pressure and TR.

Conclusion: Our data suggest that TV competence after biatrial anastomosis is related to the tension of the anterior RA wall. In patients with relatively short RA anterior wall length due to a short recipient component (D/R >1) the resulting higher wall tension limits the systolic motion of the TV annulus and consequently impedes optimal valve closure. The preservation of long recipient RA anterior wall segments (D/R <1) prevents the development of TR.

841 Tissue Doppler imaging (TDI) in patients with aortic valve stenosis-clinical usefulness and diagnostic accuracy.
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Background: Mitral annular velocities derived from tissue Doppler imaging (TDI) complement traditional variables in the evaluation of left ventricular (LV) performance. The mitral E/E' ratio has been suggested as an estimate of LV filling pressures in selected subsets of patients (pts.). However, the diagnostic usefulness of TDI has not been studied in patients with moderate or severe aortic valve stenosis (AS).

Methods & Results: 17 pts. with moderate or severe AS (aortic valve area 0.8 ± 0.4 cm 2, mean pressure gradient 61.1 ± 13 mmHg, 64 ± 11 yrs., AS group) and 29 age-matched asymptomatic controls (age 60 ± 11 yrs., CON group) underwent echocardiographic measurements of ejection fraction (EF) and mitral inflow velocities (E, A, E/A-ratio). Mitral annular velocities (S', E', A') derived from pulsed TDI were obtained at the septal mitral annulus. In AS pts., LV end-diastolic pressure (LVEDP) and cardiac index (CI) were derived from left and right heart catheterization.

ROC curve of NTproBNP for RV overload