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Left ventricular regional dysfunction in severe aortic valve stenosis: a Doppler tissue imaging study.

V. Di Bello, M.A. Mariani, J. Grandjean, D. Giorgi, C. Palagi, M.G. Detie Donne, C. Nardi, E. Talini, M. Mariani. Department of Cardio Thoracic Pisa, Italy

In patients with severe aortic stenosis (AS) the onset of heart failure is associated with increased mortality. The aim of the present study is to demonstrate if Doppler Tissue Imaging is able to early detect the regional left ventricular dysfunction in this type of patients; suggesting a further criterion to establish the correct surgical timing for aortic valvular replacement. The PW Doppler Tissue Imaging (DTI) explores the intramyocardial fibers velocity pattern across the left ventricular major axis and is relatively independent of load conditions. Aortic Stenosis (AS) patients were carefully selected in Cardiac Department; 21 subjects (AS: valve orifice ≤ 1cm²) (7 females), mean age 72.5±8.3 and 15 healthy subjects (C) of comparable age, sex and body mass index were studied. PW DTI was performed in apical 4-chamber view, with sample volume placed at basal septum and lateral wall level; considering both the diastolic waves: early Em and late Am, their ratio and the isovolumic relaxation time (IRTm).

Left ventricular mass was significantly higher in AS (183.8±68 g/m²) in comparison with C (101.5±35 g/m², p<0.0001); due to a concentric form of left ventricular hypertrophy. Left ventricular systolic function (ejection fraction and fractional shortening) was normal and comparable in both groups. E/A ratio (mitral flow-derived) showed some alterations of left ventricular diastolic function; AS (1.13±0.6) in comparison with C (1.6±0.4 g/m², p<0.003); this finding is due to a significant increase of late diastolic A wave peak velocity. The PW DTI parameters sampled at septum level, are more sensitive than the conventional Doppler parameters derived by mitral flow pattern and clarify the complex physiopathological diastolic alteration, which involves both the diastolic phases: early (Em) (reduction) and late (Am) (increase). Em/Am ratio at septum level showed the following values: AS (0.72±0.25 g/m²) vs. C (1.5±0.35 g/m², p<0.0001); a similar behaviour was observed for lateral wall. Regional myocardial diastolic function abnormalities were showed by PW DTI in severe aortic stenosis, also in presence of quite normal conventional echo left ventricular functional parameters. These DTI parameters are the expression of intramyocardial diastolic regional impairment of both the early active relaxation phase and the late passive phase linked to an increased myocardial stiffness. Further investigations need to clarify the prognostic impact of these new PW DTI findings in AS, in terms of mortality or operative risk.

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The incidence of papillary muscle rupture, ischaemic mitral regurgitation, and infant related artery relations in acute myocardial infarction.

C. Zorchn1, K. Zmudka1, W. Zajdel1, M. Pasowicza2, D. Dudek1, J. Sadowski3, W. Paworska4, W. Tracz2. 1Institute of Cardiology, Hemo and Angio, Krakow, Poland; 2Institute of Cardiology, Cardiovascular Disease, Krakow, Poland; 3Institute of Cardiology, Cardiac Surgery, Krakow, Poland

Background: Necrosis of a papillary muscle (PM) is a frequent complication of anterior myocardial infarction, more often follows re-infarction and delayed reperfusion. Frank PM rupture requires quick diagnosis, cardiac catheterization and IABP, then emergency surgery. Frank PM rupture is usually fatal because of the extremely severe Mitral Regurgitation (MR) that it produces. Echocardiography almost always recognize severe MR, and sometimes identification of the ruptured papillary muscle as the cause of severe MR. Frank PM rupture requires quick diagnosis, cardiac catheterization and IABP, then emergency surgery.

Aim: Evaluate incidence of PM rupture, ischemic MR, and their relations between IRA with echocardiographic and left ventriculographic examinations in AMI for early and long term risk stratification.

Material and Methods: From June 2001 to April 2003; 1238 patients 347 (28,03%) female and 891 male (71,97%) between 28 - 90 years old (mean age 59.12) with AMI enrolled in this study. 167 patients had previously diagnosed MI (76 inferior, 65 anterior, 20 lateral, 3 posterior, 3 right ventricular MI). All patients had left ventriculographic examinations immediately after the angioplasty or echocardiographic examination within four days. Examination details were collected retrospectively from patient’s files and/or discharge summaries. In 11 patients, diagnosis of frank PM rupture were confirmed with retrospectively collected autopsy reports.

Results: In 552 patients RCA (44,69%), in 528 patients LAD artery (42,65%), in 153 patients Cx artery (12,36%) and in 5 patients LM coronary artery (0,4%) were found as IRA. MR was found in 730 (58,86%) patients, RCA in 483 (66,17%) patients, LAD artery in 202 (27,67%) patients, Cx artery in 45 (6,16%) patients were responsible for clinical situations. PM rupture was found in 21 patients. 14 (66,7%) patients with RCA, 5 (23,81%) patients with LAD artery and 2 (9,52%) patients with Cx artery disease. Two patients had urgent surgery for PM rupture with large VSD and high degree of MR. One died in operation theatre. Other patients had invasive support in our department, and medical treatment.

Conclusion: In our group, severe MR and PM rupture are mostly related with inferior and anterior MI. Despite more often follows re-infarction and delayed reperfusion. TTE and LV are useful methods for early risk stratification.

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Contrast agent increases Doppler velocities and improves reproducibility of aortic valve area measurements in patients with aortic stenosis.

L.A. Smith1, S.J. Cowell1, A.C. White1, N.A. Boon1, D.E. Newby1, D.B. Northridge2. 1University of Edinburgh, Cardiovascular Research, Edinburgh, United Kingdom; 2Western General Hospital, Cardiology, Edinburgh, United Kingdom

Purpose: Observer variability may limit assessment of aortic stenosis by Doppler echocardiography. The aim of this study was to assess whether echocardiographic contrast improves reproducibility of aortic valve area (AVA) measurements in patients with aortic stenosis.

Methods: Twenty patients with aortic stenosis (67±10 years) underwent non-contrast and contrast Doppler echocardiography, on two occasions, three weeks apart.

Results: Intravascular and interobserver coefficients of reproducibility were 0.36 and 0.20cm² for left ventricular outflow tract (LVOT) diameter, and 0.38 and 0.24 cm² for AVA. Whilst intravascular reproducibility was unaffected, the use of contrast improved interobserver reproducibility for LVOT diameter (mean of differences -0.02±0.07 cm vs 0.01±0.10 cm, p<0.05) and AVA (mean of differences 0.02±0.10 cm² vs 0.07±0.12 cm², p<0.05) measurements. Pre- and post-velocities were increased with contrast compared to non-contrast imaging (pre: 1.7±0.20 vs 0.94±0.19 m/s, p<0.01; post: 3.7±0.87 vs 3.47±0.78 m/s, p<0.01).

Conclusions: We conclude that echocardiographic contrast agent significantly improves Doppler velocities and produces modest improvements in the reproducibility of LVOT diameter and AVA measurements. We suggest that, when assessing patients with aortic stenosis, echocardiographic contrast agents should be considered in the difficult-to-image patient with poor baseline Doppler studies or when there appears to be marked variability in sequential echocardiographic studies.

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Clinical and laboratory associates of mitral annulus calcification.


Purpose: We retrospectively investigated some clinical and laboratory parameters which associated with mitral annulus calcification (MAC).

Method: MAC is defined by transthoracic echocardiography. Clinical and laboratory characteristics of 86 patients with MAC were compared with those of 54 patients who have not MAC.

Results: Patients with MAC were slightly older. Hypertension, smoking, and history of stroke were more frequent in patients with MAC. In multivariate analysis, older age (p=0.03, Odds ratio=1.05), smoking (p=0.006, Odds ratio=3.31), and hypertension (p=0.03, Odds ratio=2.3) were found as independent associated parameters with MAC.

Clinical and Laboratory Findings

<table>
<thead>
<tr>
<th>MAC (+), n=86</th>
<th>MAC (-), n=54</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>72.2±8.8</td>
<td>69.3±7.6</td>
</tr>
<tr>
<td>Male/Female, n (%)</td>
<td>50 (58.1)/36 (41.9)</td>
<td>28 (51.9)/26 (48.1)</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>67 (77.9)</td>
<td>33 (61.1)</td>
</tr>
<tr>
<td>Diabetes, n (%)</td>
<td>23 (26.7)</td>
<td>9 (16.7)</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>36 (41.9)</td>
<td>23 (42.6)</td>
</tr>
<tr>
<td>Family Hx of CAD, n (%)</td>
<td>17 (19.8)</td>
<td>5 (9.3)</td>
</tr>
<tr>
<td>Smoking, n (%)</td>
<td>35 (40.7)</td>
<td>12 (22.2)</td>
</tr>
<tr>
<td>CAD, n (%)</td>
<td>62 (72.1)</td>
<td>22 (40.7)</td>
</tr>
<tr>
<td>History of stroke, n (%)</td>
<td>32 (37.2)</td>
<td>10 (18.5)</td>
</tr>
</tbody>
</table>

CAG: Coronary Artery Disease, MAC: Mitral Annulus Calcification, Hx: History