Left ventricular contractile reserve in severe aortic regurgitation: which kind of stress echo?

Background: In the presence of severe aortic regurgitation (AR) and left ventricular (LV) dysfunction the assessment of LV contractile reserve (LVCr) allows to select those patients who show a better outcome after surgery.

Aim: To compare the usefulness of exercise stress echocardiography (ESE) and dobutamine echocardiography (DE) in assessing the presence of LVCr in patients with severe AR candidate for valvular replacement.

Methods: 16 patients were studied (mean age 61±14 yrs, 11 males; NYHA Class 2.1±0.3).

All p showed LV systolic dysfunction (ejection fraction (EF) evaluated by Teichholz formula).

Statistical significance of achieved values was assessed.

Results: Echo – Doppler examination before procedure discovered isolated significant MR (4+) with left ventricular dilatation (LVEDD 6.6 cm).

Changes of assessed parameters obtained in consecutive examinations are depicted in table 1. All changes were independent of age, LV size, EF or NYHA status.

Conclusions: After successful surgical treatment of mild-to-moderate symptomatic chronic MR there is gradual fall in LVEDD implying continued ventricular remodeling.}

<table>
<thead>
<tr>
<th>LVEDD (cm)</th>
<th>p</th>
<th>LVEDS (cm)</th>
<th>p</th>
<th>EF [%]</th>
<th>p</th>
<th>LA (cm)</th>
<th>p</th>
<th>PAP (mmHg)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6 ± 0.3</td>
<td>0.05</td>
<td>6.4 ± 0.3</td>
<td>0.0001</td>
<td>5.7 ± 0.7</td>
<td>0.0001</td>
<td>52.0 ± 0.9</td>
<td>0.05</td>
<td>57.2 ± 4.8</td>
<td>0.01</td>
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<tr>
<td>61.2 ± 15.3</td>
<td>0.0001</td>
<td>52.0 ± 0.9</td>
<td>0.05</td>
<td>57.2 ± 4.8</td>
<td>0.01</td>
<td>5.4 ± 0.1</td>
<td>0.5</td>
<td>15.8 ± 1.5</td>
<td>0.01</td>
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</tbody>
</table>

883 Valvular resistance in the evaluation of aortic homograft valves during exercise.
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Background: The concept of resistance to flow (pressure/flow ratio) has been proposed as a useful parameter for evaluating the hemodynamic consequences of aortic stenosis. However, only limited data exists on non-invasively derived indices of valve performance.

Methods: Thirty-nine patients were studied at rest and during a symptom-limited supine exercise test. The patients were divided into 4 groups according to the valve size: 18-19 mm (n = 9), 20-21 mm (n = 9), 22-23 mm (n = 8) and 24-27 mm (n = 5). All homografts were inserted in a subcoronary position using a free-hand technique. Maximal (Pmax) and mean (Pmean) pressure difference, effective orifice area (EOA) and valve resistance (R) were calculated at rest and at peak exercise.

Conclusions: The mean (±SD) workload achieved was 62±26 W. In all groups there was a significant increase in cardiac output, pressure differences and valvular resistance during exercise (p <0.001). EOA did not change during exercise. There was a considerable overlap in pressure differences between the groups at rest and during exercise and the increase in Pmax from rest to exercise was of the same magnitude. Patients with the 18-19 mm valves showed significantly higher increase in valve resistance from 47.0±(12.9) to 60.5±(17.2) dynes x s/cm² during exercise compared with the other three sizes, 32.1(12.3) to 37.2(14.2) in the 20-21 mm valves; 26.4(8.5) to 31.2(10.0) in the 22-23 mm valves and 23.7(6.3) to 30.1(8.1) in the 24-27 mm valves (p <0.05).

Conclusion: In general, aortic homograft valves showed low valvular resistance at rest, especially in valves with sizes >20 mm in diameter, confirming low flow disturbance during increased flow rates in homograft valves. Valve resistance, in contrast to Pmax and EOA, showed a size-dependent response to increasing volume flow during exercise.