Μικτή πάθηση αορτικής βαλβίδας – κριτήρια χειρουργείου

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No conflicts of interest
We are not talking about such patients

Follow up and treat the predominant lesion
Aetiology of moderate AS and AR

> 50%?
The Simple Arithmetic of Mixed Aortic Valve Disease

LVH + Volume Load = Trouble*

Normal Left Ventricle

LV Mass Index 75 g/m²
RWT <0.42
LVEDD 50 mm
LVESD 32 mm
LVEF 62%

Moderate (Isolated) Aortic Regurgitation

LV Mass Index 94 g/m²
RWT 0.32 (tolerated)
LVEDD 58 mm (tolerated)
LVESD 35 mm (tolerated)
LVEF 65% (tolerated)

Moderate Mixed Aortic Valve Disease

LV Mass Index 103 g/m² (tolerated)
RWT 0.28 (tolerated)
LVEDD 50 mm (tolerated)
LVESD 31 mm (tolerated)
LVEF 58% (tolerated)

Moderate (Isolated) Aortic Stenosis

LV Mass Index 128 g/m²
RWT 0.41
LVEDD 53 mm (tolerated)
LVESD 33 mm (tolerated)
LVEF 61% (tolerated)

Assessment of severity???

AVA = $\frac{SV}{VTI_{AV}}$
↑ SV due to AR – higher gradients compared to isolated AS for the same AVA
Neglect $V_1$ if only $< 1.2 \text{ m/s}$
Pressure Half Time may be misleading
Can severe AS and severe AR coexist?
What really matters...
Case – 10/2015

• 56 y old male

• No symptoms – Incidental finding: Murmur

• Smoker

• CA: no critical stenoses
TTE – 10/2015
Peak vel ~3,6 m/s – mean G ~29 mmHg – AVA ~1,4-1,5 cm² - LVOT-VTI ~30 cm
TTE – 10/2015
71 asymptomatic patients (52±17 y; 21 w) at least moderate AS and AR – prospective FU every 6 m for 8.9 y

- EP: cardiac death or indication for AVR

- 22 pts: mod AS + mod AR
- 9 pts: sev AS + sev AR
- 33 pts: sev AS + mod AR
- 7 pts: mod AS + sev AR

Interesting findings

• No patient required surgery because of criteria of LV dilation

• No sudden cardiac death occurred

• Of mod AS + mod AR pts 38% required surgery within 2y and 67% within 4 y

The importance of peak AV velocity

A

Event-free Survival (%)

Years

P < 0.0001

AV-Vel 3.0 to 3.9 m/s

AV-Vel 4.0 to 4.9 m/s

AV-Vel ≥ 5.0 m/s

B

Event-free Survival (%)

Years

P < 0.0001

AV-Vel 3.0 to 3.9 m/s

AV-Vel 4.0 to 4.9 m/s

AV-Vel ≥ 5.0 m/s

Outcomes in Moderate Mixed Aortic Valve Disease
Is it Time for a Paradigm Shift?

Alexander C. Egbe, MD, MPH, Sushil A. Luis, MBBS, Ratnasari Padang, MBBS, PhD, Carole A. Warnes, MD

• Retrospective – 251 asymptomatic pts (63 ± 11 y, 73% m) with moderate AS + AR follow up for 9.1 ± 4.2 y

• AE: NYHA III/IV, AVR, death

• AE occurred in 193 (77%) pts: symptoms (69%), AVR (67%), and cardiac death (4%)

• One patient had sudden cardiac death

Multivariable predictors of AE:
1. older age
2. relative wall thickness >0.42
<table>
<thead>
<tr>
<th></th>
<th>MAVD  (n = 117)</th>
<th>Moderate AR (n = 117)</th>
<th>Moderate AS (n = 117)</th>
<th>Severe AS (n = 117)</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>79 (68)</td>
<td>79 (68)</td>
<td>79 (68)</td>
<td>79 (68)</td>
<td></td>
</tr>
<tr>
<td>Age, yrs</td>
<td>64 ± 8</td>
<td>63 ± 8</td>
<td>63 ± 5</td>
<td>64 ± 6</td>
<td>0.853</td>
</tr>
<tr>
<td>Follow-up, yrs</td>
<td>8.1 ± 4</td>
<td>7.8 ± 9</td>
<td>9.6 ± 5</td>
<td>7.1 ± 3</td>
<td>0.061</td>
</tr>
<tr>
<td><strong>Echocardiography data</strong></td>
<td></td>
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<tr>
<td>Aortic peak velocity, m/s</td>
<td>3.5 ± 0.2</td>
<td>1.7 ± 0.6</td>
<td>3.4 ± 0.3</td>
<td>4.5 ± 0.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Aortic mean gradient, mm Hg</td>
<td>36 ± 2</td>
<td>16 ± 7</td>
<td>35 ± 4</td>
<td>48 ± 6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Aortic valve area, cm²</td>
<td>1.38 ± 0.06</td>
<td>1.81 ± 0.08</td>
<td>1.22 ± 0.07</td>
<td>0.8 ± 0.02</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Aortic valve area index, cm²/m²</td>
<td>0.69 ± 0.03</td>
<td>0.98 ± 0.04</td>
<td>0.55 ± 0.04</td>
<td>0.41 ± 0.03</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Pressure half time, ms</td>
<td>361 ± 92</td>
<td>391 ± 109</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LV ejection fraction, %</td>
<td>61 ± 5</td>
<td>65 ± 7</td>
<td>58 ± 6</td>
<td>56 ± 4</td>
<td>0.19</td>
</tr>
<tr>
<td>LV end-diastolic dimension, mm</td>
<td>53 ± 7</td>
<td>58 ± 6</td>
<td>50 ± 6</td>
<td>48 ± 5</td>
<td>0.042</td>
</tr>
<tr>
<td>LV end-systolic dimension, mm</td>
<td>33 ± 8</td>
<td>36 ± 6</td>
<td>31 ± 7</td>
<td>28 ± 6</td>
<td>0.051</td>
</tr>
<tr>
<td>LV mass index, g/m²</td>
<td><strong>138 ± 56</strong></td>
<td><strong>94 ± 14</strong></td>
<td><strong>103 ± 31</strong></td>
<td><strong>123 ± 31</strong></td>
<td><strong>0.016</strong></td>
</tr>
<tr>
<td>Relative wall thickness</td>
<td><strong>0.40 ± 0.07</strong></td>
<td><strong>0.32 ± 0.04</strong></td>
<td><strong>0.38 ± 0.03</strong></td>
<td><strong>0.42 ± 0.04</strong></td>
<td>0.064</td>
</tr>
<tr>
<td>LV diastolic dysfunction</td>
<td>38 (32)</td>
<td>6 (5)</td>
<td>14 (12)</td>
<td>26 (22)</td>
<td>0.024</td>
</tr>
<tr>
<td>Left atrial volume index, ml/m²</td>
<td>31 ± 8</td>
<td>24 ± 5</td>
<td>26 ± 7</td>
<td>29 ± 3</td>
<td>0.17</td>
</tr>
<tr>
<td>RV systolic pressure, mm Hg</td>
<td>44 ± 3</td>
<td>33 ± 8</td>
<td>37 ± 8</td>
<td>41 ± 5</td>
<td>0.17</td>
</tr>
<tr>
<td>Aortic dimension 46–50 mm</td>
<td>21 (18)</td>
<td>18 (15)</td>
<td>11 (9)</td>
<td>17 (15)</td>
<td>0.096</td>
</tr>
<tr>
<td>Aortic dimension &gt;50 mm</td>
<td>3 (3)</td>
<td>0</td>
<td>0</td>
<td>1 (1%)</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Prognosis is poor...

<table>
<thead>
<tr>
<th>First Author Year (Ref. #)</th>
<th>Population</th>
<th>Mean Age, yrs</th>
<th>Average LV Mass Index, g/m²</th>
<th>5-Yr Event-Free Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zilberszac et al. 2013 (17)</td>
<td>71 patients with ≥ moderate AS and ≥ moderate AR</td>
<td>52 ± 17</td>
<td>151*</td>
<td>26%</td>
</tr>
<tr>
<td>Rashedi et al. 2014 (11)</td>
<td>190 patients with either moderate AS and ≥ mild AR or moderate AR and ≥ mild AS†</td>
<td>65 ± 14</td>
<td>Not reported</td>
<td>40%‡</td>
</tr>
<tr>
<td>Egbe et al. 2016 (13)</td>
<td>117 patients with moderate AS and moderate AR</td>
<td>64 ± 8</td>
<td>138</td>
<td>29%</td>
</tr>
</tbody>
</table>

*Calculated from data provided in publication. †Included 130 patients with moderate AS and moderate AR. ‡Extrapolated from figure.

AS = aortic stenosis; AR = aortic regurgitation; LV = left ventricular; MAVD = mixed aortic valve disease.
Points worth noticing...

- Event free survival in less than 1/3 of patients at 5 years

- Peak vel (mean G) best reflects the haemodynamic burden in these patients and has prognostic implications

- Risk of sudden cardiac death is low if close follow up (every 6 - 12 m) is applied

- In most patients progression of AS occurs
No symptoms – BNP = 13 pg/ml
Peak vel~3,7 m/s – mean G~29 mmHg – AVA~1,4-1,5 cm² - LVOT-VTI~33 cm
Exercise echo 09/2017

Bruce protocol: 9 min and 01 secs – max HR~152 bpm (94%) – 10 METs – Normal BP response (BP max~190 mmHg)
Exercise echo 09/2017
No symptoms – BNP = 40 pg/ml
Peak vel~4,1 m/s – mean G~37 mmHg – AVA~1,3-1,4 cm² - LVOT-VTI~30 cm
Exercise echo – 12/2018
Exercise echo – 12/2018

Bruce protocol: 7 min and 19 secs – **SOB** – max HR~149 bpm (92%) – ~7 METs – Normal BP response (BP max~190 mmHg)
Exercise echo – 12/2018

Bruce protocol: 7 min and 19 secs – **SOB** – max HR~149 bpm (92%) – ~7 METs – Normal BP response (BP max~190 mmHg)
Exercise echo – 12/2018
Coronary angiogram
In summary...

- Coexistence of stenosis and regurgitation – pathological consequences that are incremental to the effects of either lesion alone

- Patients with at least moderate mixed AV disease have poor prognosis and need close FU for indications for intervention

- In most patients progression of AS occurs at the time of AVR – some develop symptoms with no progression of VHD (more LVH and DD)

- Sudden cardiac death is rare when close FU is applied

- Mean G (or peak vel) best reflects the haemodynamic burden in these patients (not AVA or other markers of AR severity)
Time to intervene in balanced moderate AS and AR

- Symptoms attributed to valvular heart disease – assessment of exercise haemodynamics may be very useful

- Objective consequences of LV compromise (EF<50% and/or ESD>50 mm???)
