The mitral valve before and after Percutaneous Mitral Commissurotomy
Rheumatic MV stenosis – a Not Forgotten disease...

Iung et al. *Eur Heart J* 2003;24:1244-53


www.escardio.org/guidelines
Patient Characteristics

- Male, 67 years old (01/2012)
- Weight: 92 Kg, Height: 1.63 m (BMI 34.6)
- Dyspnea (NYHA III), Fatigue (1 y)
- S1 (loud), S2, irregular
- Mid diastolic murmur
- Mild systolic ejection murmur
- ECG: AF, laboratory values: INR 1.7
Patient History

• Rheumatic MV stenosis (1985)
• Arterial Hypertension (10 y)
• Permanent AF (5 y)
• Smoking: no
TTE

parasternal long axis

apical 4-CH view
TTE

parasternal short axis

Planimetry: MVA 1.1 – 1.2 cm²
Aortic stenosis
RV systolic function

TAPSE = 1.82 cm  Sm = 0.1 m/s
DENSE SPONTANEOUS ECHO CONTRAST IN LA
NO THROMBUS IN THE LAA

MV, TV AND THE INTERATRIAL SEPTUM
MILD MITRAL REGURGITATION
TEE

AORTIC STENOSIS
CARDIAC CATHETERIZATION

(26/01/2012)
Coronary arteries without critical stenoses
RIGHT ATRIAL pressure

Summary: 68+R: RA 6/6/5 AO 190/80/112
RIGHT VENTRICULAR pressure

Summary: 68HR RV 35/-3/1 dP/dt:522 dP/dt/P:33 AO 175/80/114
LA - LV pressure gradient
LV - AORTA pull-back

Summary: 68HR: Diff:Aortic 0 Gradient:Aortic 0 Diff:Mitrall 0 Gradient:Mitrall 0 LA 10/10/9 LV 152/-1/11 AO 164/56/107
### Hemodynamics table

<table>
<thead>
<tr>
<th>Cardiac chamber</th>
<th>Values (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>6 (mean)</td>
</tr>
<tr>
<td>RV</td>
<td>35/5</td>
</tr>
<tr>
<td>LA</td>
<td>11 (mean)</td>
</tr>
<tr>
<td>LV</td>
<td>150/6</td>
</tr>
<tr>
<td>AscAo</td>
<td>150/70</td>
</tr>
<tr>
<td>MV gradient</td>
<td>5 (mean)</td>
</tr>
</tbody>
</table>
What about the aortic valve?

In patients with severe MS combined with severe aortic valve disease, surgery is preferable. In cases with severe MS with moderate aortic valve disease, PMC can be performed as a means of postponing the surgical treatment of both valves.

Guidelines on the management of valvular heart disease (version 2012)
LA - LV pressure gradient immediately post PMC
TEE: post PMC

The MITRAL VALVE post PMC
The MITRAL VALVE post PMC

The MITRAL VALVE pre PMC
Atrial Septal Shunt
• Patient discharged 05/02/2012, clinically improved
• Did not present for scheduled FU
• 12/05/2015 Presented with dyspnoea and peripheral oedema
TTE (12/05/2015)

parasternal long axis

apical 4-CH view
RA, RV dilatation

Moderate-to-severe TR
PERCUTANEOUS MITRAL COMMISSUROTOMY

Complications:

- Mortality 0.5 – 4%
- Hemopericardium 0.5 – 10%
- Embolism 0.5 – 5%
- Severe regurgitation 2 – 10%
- Emergency surgery <1%
- Iatrogenic left-to-right shunt at the interatrial level
LUTEMBACHER SYNDROME

Described by René Lutembacher in 1916

- Mitral stenosis congenital or acquired
- Left-to-right atrial shunt (ASD), congenital or acquired

- Incidence of ASD in patients with MS 0.6-0.7%
IATROGENIC LEFT-TO-RIGHT SHUNTS

- Frequency 10 – 90%
- Persist for months (usually up to 1 year) and in some cases for years (up to 6 years)
- Usually small and restrictive
- Usually haemodynamically insignificant (Qp/Qs < 1.5)
- Patients don’t differ concerning echo or demographic data, NYHA class, severity of MR, and acute procedural success rates
- May be associated with worse clinical outcomes at FU: NYHA > II, higher levels of NT-proBNP, less improvement in 6MWT and higher death rates at 6-month FU.

Korkmaz et al. Tex Heart Inst J. 2011;38(5): 523-527
Schueler et al. JACC 2015; 8(3):450-459
CARDIAC CATHETERIZATION

(21/05/2015)
RIGHT ATRIAL pressure

AO 200 mmHg
RA 40 mmHg

Summary: 55HR: AO 125/54/60 RA 11/9/9
RIGHT VENTRICULAR PRESSURE

Summary: 65HR: AO 125/65, 86 RV 36/8/10 dP/dt: 645 dP/dt/P: 23
PCWP, LV gradient
PCWP, LV - AORTA pull-back
RV VENTRICULOGRAM

RVEF 46.3%
### Hemodynamics table

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<tr>
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<th>Values (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>9 (mean)</td>
</tr>
<tr>
<td>PA</td>
<td>52/24 (37)</td>
</tr>
<tr>
<td>LA</td>
<td>11 (mean)</td>
</tr>
<tr>
<td>LV</td>
<td>150/5</td>
</tr>
<tr>
<td>AscAo</td>
<td>130/85</td>
</tr>
<tr>
<td>AV gradient</td>
<td>20</td>
</tr>
<tr>
<td>MV gradient</td>
<td>6 (mean)</td>
</tr>
<tr>
<td>CO RV</td>
<td>7.92 L/min</td>
</tr>
<tr>
<td>CO LV</td>
<td>3.45 L/min</td>
</tr>
<tr>
<td>Qp/Qs</td>
<td>2.3</td>
</tr>
</tbody>
</table>
Heart Team Discussion

- MV stenosis
- AV stenosis
- ASD
- TV regurgitation
- RV dysfunction
Thickened MV leaflets, very restricted motion of the posterior leaflet. Typical doming of the anterior leaflet, with moderate valve stenosis
ASD, wide jet with significant left-to-right shunt (~ 19 x 12 mm, vol ~ 43 ml – Qp/Qs = 1.7)
Severe TR (Reg Vol 52 ml, Reg fraction 40%) – wide regurgitant jet, reaching the roof of the right atrium.
Tricuspid AV – thickened and calcified cusps, moderate stenosis (AVA with planimetry 1.2 – 1.3 cm²)
<table>
<thead>
<tr>
<th></th>
<th>EDV (ml)</th>
<th>ESV (ml)</th>
<th>CO (ml)</th>
<th>EF (%)</th>
<th>Mass (g)</th>
<th>Mass/BSA (g/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV</td>
<td>151 (102-218)</td>
<td>73 (18-82)</td>
<td>77 (74-150)</td>
<td>52 (57-81)</td>
<td>132 (81-165)</td>
<td>71 (45-81)</td>
</tr>
<tr>
<td>RV</td>
<td>347 (124-256)</td>
<td>177 (38-118)</td>
<td>170 (75-151)</td>
<td>49 (47-71)</td>
<td></td>
<td></td>
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</tbody>
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LV with normal dimensions and marginal systolic impairment.
Low normal RV EF (probably overestimated due to volume overload).
MVR – ATS 31 mm

AVR – ATS 23 mm

TV repair

ASD closure
THANK YOU
Contraindications for percutaneous mitral commissurotomy

- Mitral valve area > 1.5 cm².
- Left atrial thrombus.
- More than mild mitral regurgitation.
- Severe or bicommissural calcification.
- Absence of commissural fusion.
- Severe concomitant aortic valve disease, or severe combined tricuspid stenosis and regurgitation.
- Concomitant coronary artery disease requiring bypass surgery.
- **Unfavourable anatomy:**
  - Echo score $> 8$
  - Cormier score 3 (calcification of MV of any extent on fluoroscopy)
  - Very small MVA
  - Severe TR

- **Unfavourable clinical characteristics:**
  - Old age
  - History of commissurotomy
  - NYHA class IV
  - Permanent AF
  - Severe PH
PERCUTANEOUS MITRAL COMMISSUROTOMY

- Good initial results in over 80% of cases, with valve area > 1.5 cm² and no MR > 2/4

- Long-term results: event-free survival 30-70% after 10-20 y.

- Major complications:
  - Mortality 0.5 – 4%
  - Heamopericardium 0.5 – 10%
  - Embolism 0.5 – 5%
  - Severe regurgitation 2 – 10%
  - Emergency surgery <1%