Plasty of Left Atrium During Mitral Valve Replacement

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Background

MVR without plasty of giant LA:

- **Worse hemodynamic conditions**
- **Presence of giant LA (60 mm and more) is the risk of thrombolic events, bronchus`s and left ventricle`s compression at the remote period**
Definition

• Left atrio megaly is determined as the chamber of left atrium 60 mm and more by ECHO examination
A chest radiograph of a 38-year-old woman, who was diagnosed with rheumatic mitral stenosis, revealed cardiac enlargement due to a giant left atrium that was distorting the cardiac structures. The patient’s cardiothoracic ratio was approximately 0.90.

A giant left atrium can readily be delineated by echocardiography. Optimal timing of surgery is important in cases of mitral stenosis, because delaying mitral valve replacement can lead to fatal outcomes.

To our knowledge, the left atrial diameter of 18.7 cm that we found in our patient is the largest reported to date. (Tex Heart Inst J 2006;33:389-91)
Percentage of sinus rhythm stability depending on LA’s size in isolated MVR (n=1361)

- After operation:
  - <4.0: 86.9%
  - 4.1-4.5: 73.5%
  - 4.6-5.0: 70.6%
  - 5.1-5.5: 48.2%
  - 5.6-6.0: 44.6%
  - 6.1-6.5: 43.0%
  - 6.6-7.0: 28.1%
  - 7.1-7.5: 34.3%
  - 7.6-8.0: 24.1%
  - >8.1: 5.7%

- Before MVR:
  - <4.0: 86.9%
  - 4.1-4.5: 70.6%
  - 4.6-5.0: 2.9%
  - 5.1-5.5: 12.5%
  - 5.6-6.0: 5.0%
  - 6.1-6.5: 13.0%
  - 6.6-7.0: 17.1%
  - 7.1-7.5: 20.7%
  - 7.6-8.0: 31.7%
  - >8.1: 43.0%

Legend:
- Red line: after operation
- Blue line: before MVR
OBJECTIVE

To determined possibilities of left atrium (LA)’s reduction by paraannular plasty of LA (PPLA) during mitral valve replacement (MVR) for isolated mitral valve disease (MVD).
METHODS

During 1.01.2000 – 1.01. 2009 yy. 233 adult patients (pts) were operated with MVD and giant LA at Institute. MVR were performed in all pts.

103 (44,2%) males

130 (55,8%) females

Average age was 54,2 ± 5,7 yy.

191 (82,0%) in IY NYHA class

42 (18,0%) in III class.
METHODS

• The reasons of MVD were: rheumatism, lipoidoses, atherosclerosis and others.

• 21 (9,1%) operations were performed after previous closed mitral commissurotomy.

• Concomitant correction of tricuspid valve disease was in 23 (10,1%) pts.
METHODS

- PPLA including ligation of LA`s auriculum was performed in 154 (66.1%) pts (group A) and in other 79 (33.9%) pts only – MVR was occurred without PPLA and ligation of LA`s auriculum (group B).
## Value of LV–LA before operation

<table>
<thead>
<tr>
<th>Value</th>
<th>Main group A</th>
<th>Control group B</th>
<th>P</th>
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<tbody>
<tr>
<td>ESVI (ml/m²)</td>
<td>68,4± 9,1</td>
<td>68,2± 8,9</td>
<td>NS</td>
</tr>
<tr>
<td>EF LV</td>
<td>0,53 ± 0,05</td>
<td>0,54 ± 0,04</td>
<td>NS</td>
</tr>
<tr>
<td>LA (mm)</td>
<td>63,2 ± 5,4</td>
<td>65,1 ± 4,4</td>
<td>NS</td>
</tr>
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</table>
METHODS

• All operations were performed with cardiopulmonary bypass and moderate hypothermia with crystalloid cardioplegia.

• Cross-clamping time of aorta was 81.4 ± 7.3 min in group A and group B 55.4 ± 7.1 minutes (p<0.05).
Group A (n=154)

1. MVR with preservation of posterior leaflet – 100%
2. + translocation of anterior leaflet’s papillary muscles – 55,1%
3. + LA’s paraannular plasty – 100,0%

Concomitant – plasty of TV – 11,0%
Paraannular plasty of LA
Group B (n=79)

1. MVR with preservation of posterior leaflet – 54%
2. + translocation of anterior leaflet’s papillary muscles – 15.5%
3. + LA’s paraannular plasty – 0.0%

Concomitant – plasty of TV – 15.4%
Calcification of massive thrombi's basement (n=5)
RESULTS

• There were 3 deaths at the hospital period in group A (hospital mortality (HM) - 1.9%).

• The reasons heart failure: heart failure (1), brain damage (1), MOF (n=1).

• Hospital mortality in group B - 2.5% (reason heart failure was heart failure n=2).
Morphometry of left side of the the heart after MVR

<table>
<thead>
<tr>
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<th>Diameter of LA (mm) (echo)</th>
<th>ESVI of LV (ml/m/q/) (echo)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before operation</td>
<td>7th postoper. day</td>
</tr>
<tr>
<td>Group A LA`s plasty (n=154)</td>
<td>63,2 ± 5,4</td>
<td>47,8 ± 3,1</td>
</tr>
<tr>
<td>Control group B - only MVR (n = 79)</td>
<td>65,1 ± 4,4</td>
<td>63,8 ± 4,1</td>
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</tbody>
</table>
Remote results (group A)

143 (94.7%) pts follow-up

excellent – good
129 (90.2%)

Average follow-up
5.1 ± 1.2 years

sinus rhythm – 39.9%

No: deaths, thrombolic events, valve’s dysfunction
Remote results (group B)

71 (93.4%) pts follow-up

excellent – good
39 (56.5%)

Average follow-up
5.8 ± 1.2 years

sinus rhythm – 0.0%

deaths (n=5), thrombolic events (n=5), progressive heart failure (n=9)
CONCLUSION

PPLA during MVR for MVD was allowing to improve LA's morphometry, LV's contractility during early and at the remote period comparing with group B (p<0,05). There weren't any specific complications at the postoperative period in group A. We recommend PPLA in all pts with LA's significant dilatation.
Thank You for Your kind attention!