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“Incidence, clinical predictors, and prognosis of isolated tricuspid regurgitation late after mitral valve surgery”

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Incidence, clinical predictors, and prognosis of isolated tricuspid regurgitation late after mitral valve surgery

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Case: 80 y.o. female, 10 years after MVR

LVi E: 189cm/s, DcT: 240msec  EF: 62%, TR: 2.7m/s
Tricuspid valve is a “forgotten” valve!

- TR is usually secondary.
- TR may appear and progress late after mitral valve op.
- Right HF is usually controllable for a long period with diuretic drugs.
- The course of TR over a long period of time may shed some light on this disease.
Prognosis of TR is poor!

Nath J et al. J ACC 2004
Objective

The purpose of this study is to clarify the incidence, clinical characteristics and prognosis of severe isolated TR late after mitral valve surgery.
Study Patients

374 pts with mitral valve surgery in 1985 – 2004

- moderate-severe TR early after mitral op 6 pts
- F/U period with echo<5 yrs 39 pts

329 patients (M/F: 146 /183; age at op 57±11 yrs)

Mean follow-up period : 11.7 (5-24) years

- Incidence of severe isolated TR
- Clinical background
- Preoperative echocardiographic data
- Treatment and prognosis
### Baseline characteristics of study patients

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>57±11 (range 18-78) years</td>
<td></td>
</tr>
<tr>
<td>sex, male</td>
<td>146</td>
<td>(44%)</td>
</tr>
<tr>
<td>preoperative cardiac rhythm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sinus rhythm</td>
<td>76</td>
<td>(23%)</td>
</tr>
<tr>
<td>atrial fibrillation</td>
<td>253</td>
<td>(77%)</td>
</tr>
<tr>
<td>types of mitral valve surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVR</td>
<td>188</td>
<td>(57%)</td>
</tr>
<tr>
<td>Repair</td>
<td>80</td>
<td>(24%)</td>
</tr>
<tr>
<td>OMC</td>
<td>61</td>
<td>(19%)</td>
</tr>
<tr>
<td>history of previous valve surgery</td>
<td>85</td>
<td>(26%)</td>
</tr>
<tr>
<td>TAP at mitral valve surgery</td>
<td>63</td>
<td>(19%)</td>
</tr>
</tbody>
</table>
Definition of severe isolated TR

- TR jet area > 10 cm²
- without
  - Left heart failure (mitral & aortic valve dysfunction, LV dysfunction etc)
  - Pulmonary HT (PAs > 40 mmHg)
  - Rheumatic tricuspid valve
  - Transvenous pacemaker implantation
  - Constrictive pericarditis
What are risk factors of severe isolated TR?

Evaluation of clinical features

- Age at mitral valve surgery
- Rhythm (Af or SR)
- TAP at mitral valve surgery
- History of previous valve operations
- Types of mitral valve surgery
- Underlying valve diseases
What are risk factors of severe isolated TR?
Evaluation of preoperative Echo data

- LVDd
- LVDs
- EF
- LAD
Treatment & Prognosis in pts with severe isolated TR

• Treatment
  ✓ Medical or surgical treatment

• Prognosis
  ✓ Survival rate
  ✓ Incidence of cardiac death
  ✓ Hospitalization for congestive heart failure
Results
Incidence of isolated TR after mitral valve op

329 cases
after mitral valve surgery

severe TR (-): 264 pts

severe TR (+): 65 pts

Left heart failure and/or PH: 27 pts
Pacemaker: 8 pts, CP: 2 pts, Rheumatic: 2 pts

severe isolated TR
26 patients (8%)
### Characteristics of pts with severe isolated TR

#### Clinical background

<table>
<thead>
<tr>
<th></th>
<th>severe TR(-)</th>
<th>severe TR(+)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=264)</td>
<td>(n=26)</td>
<td></td>
</tr>
<tr>
<td>Age at left-sided op</td>
<td>56±12</td>
<td>59±10</td>
<td>0.26</td>
</tr>
<tr>
<td>Pre-op Af</td>
<td>182 (69%)</td>
<td>25 (96%)</td>
<td>0.0042</td>
</tr>
<tr>
<td>Previous valve op</td>
<td>71 (27%)</td>
<td>4 (15%)</td>
<td>0.34</td>
</tr>
<tr>
<td>TAP at left-sided op</td>
<td>48 (18%)</td>
<td>3 (12%)</td>
<td>0.58</td>
</tr>
<tr>
<td>MVR</td>
<td>148 (56%)</td>
<td>16 (62%)</td>
<td>0.67</td>
</tr>
<tr>
<td>MS</td>
<td>132 (50%)</td>
<td>16 (62%)</td>
<td>0.30</td>
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</table>
Characteristics of pts with severe isolated TR
= Preoperative Echo data =

<table>
<thead>
<tr>
<th></th>
<th>severe TR(-) (n=264)</th>
<th>severe TR(+) (n=26)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVDd (mm)</td>
<td>55 ± 9</td>
<td>57 ± 9</td>
<td>0.45</td>
</tr>
<tr>
<td>LVDs (mm)</td>
<td>35 ± 9</td>
<td>39 ± 9</td>
<td>0.07</td>
</tr>
<tr>
<td>LAD (mm)</td>
<td>54 ± 13</td>
<td>60 ± 8</td>
<td>0.05</td>
</tr>
<tr>
<td>EF (%)</td>
<td>67 ± 11</td>
<td>59 ± 11</td>
<td>0.002</td>
</tr>
</tbody>
</table>
Characteristics of pts with severe isolated TR after MV op

= multivariate logistic regression analysis =

<table>
<thead>
<tr>
<th></th>
<th>Odd ratio</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op Af</td>
<td>10.42</td>
<td>1.25～86.55</td>
<td>0.03</td>
</tr>
<tr>
<td>EF</td>
<td>1.06</td>
<td>1.02～1.12</td>
<td>0.008</td>
</tr>
<tr>
<td>LAD</td>
<td>0.99</td>
<td>0.96～1.03</td>
<td>0.84</td>
</tr>
</tbody>
</table>
Time interval between mitral valve op and development of severe isolated TR (n=26)

mean=9.9 yrs
Follow-up period after developing severe isolated TR

Prognosis of severe isolated TR (n=26)

Survival rate

3 years: 92%
5 years: 87%
8 years: 72%
Prognosis of severe isolated TR (n=26)

Cardiac death-free rate

Follow-up period after developing severe isolated TR

3 years: 92%
5 years: 92%
8 years: 84%
Prognosis of severe isolated TR (n=26) ~ HF Hospitalization-free rate ~

Follow-up period after developing severe isolated TR

3 years: 83%
5 years: 70%
8 years: 61%
Treatment for Pts with severe isolated TR

26 pts with severe isolated TR

- Hospitalization for HF: 7 pts
- NYHA class II: 2 pts
- Leg edema (+) or Asymptomatic: 17 pts

TV surgery 3 pts: Cardiac death (-)

Medical Tx alone 4 pts: Cardiac death: 3 pts, non-cardiac death: 1 pts

Leg edema (+) or Asymptomatic 17 pts: Medical Tx alone, Cardiac death (-)
Case: 75 y.o. female, 17 years after MVR

After increasing diuretics

4 weeks
Follow-up period after developing severe isolated TR

Cardiac death-free rate

Prognosis of severe isolated TR (n=26)

Cardiac death-free rate ~

5 years 100% 100%
8 years 91% 80%

Follow-up period after developing severe isolated TR
Conclusions

♥ Severe isolated TR developing late after mitral valve surgery is not uncommon.
♥ Atrial fibrillation and preoperative ejection fraction were clinical determinants for the progression of severe isolated TR.
♥ Prognosis of patients with medical treatment alone was not poor, but early surgical treatment for severe isolated TR may improve the prognosis of the patients with severe isolated TR.
Thank you for your attention