Anterolateral Thoracotomy for Mitral Valve Repair and Replacement

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Introduction

- Alternative approaches to standard sternotomy for mitral valve operations have been advocated in the two decades as facilitating technologies have been developed.
- These various approaches include minithoracotomies, partial sternotomies, and parasternal incisions.
- Our institution has based its minimally invasive approach on a right anterior mini-thoracotomy approach combined with balloon endo-aortic occlusion, fibrillatory arrest, or direct clamping and either peripheral or central arterial cannulation for the vast majority of mitral valve operations.
This study examines a single institutional experience with minimally invasive mitral valve operations over an 18-year period with a mini-thoracotomy approach.

The analysis focuses on the technical aspects of the procedures and reviews the short-term morbidity and mortality.
Materials and Methods

- Between March 1992 and February 2010, a total of 386 patients underwent minimal invasive MV surgery for MR at our institution using a right lateral mini-thoracotomy and femoral cannulation for cardiopulmonary bypass.

- Of these, a total of 348 (90.2%) patients underwent MV repair.

- The mean grade of preoperative MR was 3.3; 0.6, age was 66.3; 12.7 years, ejection fraction was 59.2; 15.1% and 201 patients (52.1%) were male.
Results

- The procedure was successfully performed in all but one patient (0.26%) who required intraoperative conversion to full sternotomy. MV repair techniques consisted of ring annuloplasty with or without chordae-replacement or Carpentier-type leaflet resection.

- 107 patients (27.7%) had undergone previous median sternotomy for coronary or valvular disease.

- Concomitant procedures consisted of atrial fibrillation ablation in 124 patients (32.1%)

- Tricuspid valve surgery in 12 patients (3.1%)

- Patent foramen ovale/atrial septal defect closure in 31 patients (8%).
Table 1.0 **Mitral Valve Repair**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous median sternotomy</td>
<td>107</td>
<td>(27.7%)</td>
<td>241</td>
<td>(69.3%)</td>
</tr>
<tr>
<td>Atrial fibrillation ablation done concomitantly</td>
<td>124</td>
<td>(32.1%)</td>
<td>224</td>
<td>(64.4%)</td>
</tr>
<tr>
<td>Tricuspid Valve surgery done concomitantly</td>
<td>12</td>
<td>(3.1%)</td>
<td>336</td>
<td>(96.6%)</td>
</tr>
<tr>
<td>Patent Foramen Ovale/ Atrial septal closure</td>
<td>31</td>
<td>(8%)</td>
<td>317</td>
<td>(91.1%)</td>
</tr>
</tbody>
</table>

Total of 348 (90.2%) patients underwent MV repair
Mean duration of CPB was 80 min and mean aortic cross-clamp time was 50 min.

Thirty-day mortality was 2.3%. Follow-up was performed in 99% of patients at an average of 30.1 months postoperatively.

The Kaplan-Meier estimate for survival at 5 years was 85.6% (95% CI: 78.9-85.7%) and for freedom from MV reoperation was 97.3% (95% CI: 94.6-97.4%).
Univariate risk factor analysis

- Increased risk: Advanced age, New York Heart Association functional class 4, previous cardiac operation, emergency operation, and diabetes
- Decreased risk: Isolated mitral procedure
Multivariate analysis

Increased risk-New York Heart Association functional class 4, age greater than 69, emergency operation, peripheral vascular disease, and concomitant procedures.
Conclusion

- Minimal invasive MV repair via small anterolateral thoracotomy, along with certain concomitant procedures, can be performed in the vast majority of patients with Mitral Disease.
- Our large series demonstrates that these procedures can be performed with low peri-operative complication rates and excellent durability.