Loss of Correction in Treatment of Thoracolumbar Kyphosis Secondary to Ankylosing Spondylitis: A Comparison between Smith-Petersen Osteotomies and Pedicle Subtraction Osteotomy

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Paper #90 Loss of Correction in Treatment of…

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Goal of surgery

- Restore sagittal balance
- Obtain the ability to see straight ahead
- Improve diaphragmatic respiration
- Decrease pressure on abdominal cavity

Pre-op

Post-op
Objective

- To evaluate the difference of correction and loss of correction between SPOs group and PSO group
Methods

Smith-Petersen osteotomies (SPOs)

Pedicle subtraction osteotomy (PSO)
# Demography

<table>
<thead>
<tr>
<th></th>
<th>SPOs Group</th>
<th>PSO group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case No.</strong></td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>21-40 yrs (mean, 27yrs)</td>
<td>22-54 yrs (mean, 36 yrs)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>M: 16; F: 3</td>
<td>M: 26; F: 5</td>
</tr>
<tr>
<td><strong>Preoperative GK</strong></td>
<td>41-99° (mean, 64.6 ± 25.6°)</td>
<td>50-96° (mean, 73.7 ± 23.6°)</td>
</tr>
</tbody>
</table>
Radiographic evaluation

- Sagittal vertical axis (SVA)
- Global Kyphosis (GK)
- Lumbar lordosis (T12-S1 angle)
Angle of fusion levels (AFL)

Pre-op

Post-op
# Radiographic comparison

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group</th>
<th>Pre-op</th>
<th>Post-op</th>
<th>Final FU</th>
<th>Correction</th>
<th>Loss of correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVA (cm)</td>
<td>SPOs</td>
<td>14.7±4.8</td>
<td>2.3±3.5</td>
<td>3.8±3.1</td>
<td>12.6±6.3②</td>
<td>1.5±1.9</td>
</tr>
<tr>
<td></td>
<td>PSO</td>
<td>18.5±4.6</td>
<td>6.0±5.6</td>
<td>7.7±5.5</td>
<td>12.6±7.0②</td>
<td>1.7±1.8</td>
</tr>
<tr>
<td>T12-S1(°)</td>
<td>SPOs</td>
<td>-4.8±18.8</td>
<td>-43.4±19.6</td>
<td>-42.0±19.0</td>
<td>38.6±12.8②</td>
<td>1.4±6.3</td>
</tr>
<tr>
<td></td>
<td>PSO</td>
<td>-3.9±20.2</td>
<td>-46.5±19.7</td>
<td>-45.6±15.5</td>
<td>42.6±15.7②</td>
<td>0.9±8.1</td>
</tr>
<tr>
<td>GK (°)</td>
<td>SPOs</td>
<td>64.6±25.6</td>
<td>25.5±26.1</td>
<td>29.4±23.4</td>
<td>39.1±13.5②</td>
<td>3.9±6.0</td>
</tr>
<tr>
<td></td>
<td>PSO</td>
<td>73.7±23.6</td>
<td>31.4±17.8</td>
<td>33.8±15.7</td>
<td>42.3±22.4②</td>
<td>2.4±5.9</td>
</tr>
<tr>
<td>AFL (°)</td>
<td>SPOs</td>
<td>21.9±14.7</td>
<td>-21.7±14.7</td>
<td>-15.6±19.9</td>
<td>43.6±18.3②</td>
<td>6.1±6.7①</td>
</tr>
<tr>
<td></td>
<td>PSO</td>
<td>22.3±21.4</td>
<td>-21.7±15.1</td>
<td>-20.4±15.8</td>
<td>43.9±9.7②</td>
<td>1.3±5.4①</td>
</tr>
</tbody>
</table>

① Significant difference between two groups: P < 0.05. ② Significant difference between pre- and post-operative values: P < 0.05.
PSO: Loss of correction in instrumented region

- Correction through three columns
- Rapid consolidation after osteotomy closure

Post-op 4y FU
Conclusions

Both SPOs and PSO demonstrated similar effect in correction of kyphosis.

Patients treated with SPOs showed higher risk in loss of correction in the instrumented region.
References


