Laterally Placed Expandable Interbody Spacers with Adjustable Lordosis Improved Radiographic and Clinical Outcomes: A 2-year Follow-up Study

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- JT – Nothing to disclose
Background

• Minimally invasive lateral lumbar interbody fusion (MIS LLIF) = popular approach
  • Indirect posterior decompression
  • Deformity correction
  • Great for revision
  • Minimal tissue disruption
  • Wider footprint for interbody device for fusion
Expandable Interbody Spacers

- No forceful impaction and/or excessive trialering
- Expandable trialing = gradual distraction
- Continuous expansion + adjustable lordosis
Materials and Methods

• Single-center contribution
• Retrospective, IRB-exempt
• Radiographic Outcomes
  • Disc Height
  • Neuroforaminal Height
  • Segmental Lordosis
  • Lumbar Lordosis
  • Subsidence
• Clinical Outcomes
  • Visual Analog Score (VAS) for back pain
  • Oswestry Disability Index (ODI)

6 weeks, 3, 6, 12 and 24 month follow-up
MIS LLIF Technique

- Review MRI anatomy to plan approach
- Secure patient in lateral decubitus positional
- Retroperitoneal prepsoas or transpsoas approach
- Neuromonitoring
- Careful mobilization and protection of great vessels
MIS LLIF Technique

- Docking of MIS retractors
- Disc removal and endplate preparation
- Inserting expandable spacer packed with autograft
- Expansion of spacer
- Backfill
- Pedicle screws/rods for supplemental posterior fixation
Results

- Avg. age: 57.8±12.6 yrs
- 45.8% female
- 24 consecutive patients
- 19/24=1-Level
- 5/24=2-Level
- =29 Levels Total
  - 41.3% at L4-5
  - 34.5% at L3-4

- Mean EBL
  - 1-Level: 18.3 cc
  - 2-Level: 31.0 cc

- Mean Operative Time
  - 1-Level: 53.9 min
  - 2-Level: 79.2 min

- Mean Fluoroscopic Time
  - 1-Level: 27.5 sec
  - 2-Level: 34.8 sec
## Results: Radiographic Outcomes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>6 Weeks</th>
<th>3 Months</th>
<th>6 Months</th>
<th>12 Months</th>
<th>24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS Back Pain</td>
<td>8.4 (0.6)</td>
<td>4.1 (1.1)*</td>
<td>3.2 (1.0)*</td>
<td>2.3 (1.0)*</td>
<td>2.0 (1.6)*</td>
<td>1.1 (1.0)*</td>
</tr>
<tr>
<td>ODI</td>
<td>79.1 (8.0)</td>
<td>49.0 (17.1)*</td>
<td>35.1 (13.1)*</td>
<td>27.1 (14.1)*</td>
<td>19.2 (16.3)*</td>
<td>11.6 (9.5)*</td>
</tr>
<tr>
<td>Anterior Disc Height (mm)</td>
<td>7.8 (3.2)</td>
<td>14.5 (2.6)*</td>
<td>13.9 (2.6)*</td>
<td>13.3 (2.2)*</td>
<td>12.8 (2.0)*</td>
<td>12.3 (1.9)*</td>
</tr>
<tr>
<td>Middle Disc Height (mm)</td>
<td>6.4 (2.5)</td>
<td>12.4 (2.3)*</td>
<td>11.4 (2.6)*</td>
<td>11.1 (2.3)*</td>
<td>10.8 (2.2)*</td>
<td>10.5 (2.2)*</td>
</tr>
<tr>
<td>Posterior Disc Height (mm)</td>
<td>4.4 (1.7)</td>
<td>8.8 (2.0)*</td>
<td>8.1 (1.8)*</td>
<td>7.7 (1.6)*</td>
<td>7.2 (1.8)*</td>
<td>7.0 (1.7)*</td>
</tr>
<tr>
<td>Neuroforaminal Height (mm)</td>
<td>14.7 (3.1)</td>
<td>21.0 (3.7)*</td>
<td>20.2 (3.5)*</td>
<td>19.2 (3.3)*</td>
<td>18.3 (3.2)*</td>
<td>18.0 (3.0)*</td>
</tr>
<tr>
<td>Segmental Lordosis (°)</td>
<td>4.4 (3.1)</td>
<td>9.4 (3.1)*</td>
<td>8.9 (3.0)*</td>
<td>8.6 (2.9)*</td>
<td>8.1 (2.3)*</td>
<td>8.0 (2.2)*</td>
</tr>
<tr>
<td>Lumbar Lordosis (°)</td>
<td>37.8 (10.8)</td>
<td>48.5 (7.4)*</td>
<td>47.5 (5.0)*</td>
<td>45.5 (5.9)*</td>
<td>44.4 (5.6)*</td>
<td>44.2 (6.4)*</td>
</tr>
</tbody>
</table>

*P<0.05 compared to baseline. Mean (SD).
Results: Clinical Outcomes

Mean VAS back pain (A) and ODI (B) is shown. The results show a significant decrease in from baseline and sustained at 1.5, 3, 6, 12, and 24 months. *P<0.05 compared to baseline
Results: Subsidence

- No subsidence reported
Conclusions

• In MIS LLIF, titanium expandable interbody spacers with adjustable lordosis showed significant positive clinical outcomes based on decreased VAS pain scores and ODI scores up to 2-year follow-up

• Sagittal alignment was achieved and maintained to 2-year follow-up

• The use of expandable spacers with adjustable lordosis was shown to be safe and effective in the studied patients