Adjustable Lordotic Expandable Technology Improves Clinical Outcomes: Minimally Invasive Lateral Lumbar Interbody Fusion for DDD

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Disclosures

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• JT – Nothing to disclose
Introduction

• **Static spacers** forceful impaction/excessive trialing may result in:
  - Iatrogenic endplate damage
  - Implant subsidence

• **Expandable spacers** gradual distraction + expandable trialing are designed for:
  - Continuous expansion + adjustable lordosis
  - Optimal endplate-to-endplate contact
  - Controlled disc height restoration
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

- Patient secured in lateral decubitus position
- Retroperitoneal prepsoas or tranpsoas approach
- Neuromonitoring
- Docking of MIS retractor
- Disc removal and endplate preparation
- Inserting expandable spacer packed with autograft
- Expansion of spacer
- Backfill with graft
- Pedicle screws/rods for supplemental posterior fixation
Results

- 66 consecutive patients
- **Avg. age**: 58.0±12.1 yrs
- **47.0%** female
- **53/66=1-Level**
- **13/66=2-Level**
- **= 79 Levels Total**
  - **48.1%** at L4-5

MIS LLIF

- **Mean EBL**
  - 25.9±12.8cc
- **Mean Operative Time**
  - 58.0±17.1 min
- **Mean Fluoroscopic Time**
  - 29.8±14.1 sec

Contracted and expanded interbody spacer with adjustable lordosis
## Radiographic Outcomes

**Table 1:** Mean Values of Radiographic Parameters at baseline to 1.5, 3, 6, 12, and 24 month follow-up

*P*<0.05 compared to baseline. Mean (SD).

<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>Anterior Disc Height (mm)</td>
<td>7.7 (3.1)</td>
<td>14.6 (2.3)*</td>
<td>13.9 (2.3)*</td>
<td>13.3 (2.1)*</td>
<td>13.0 (2.1)*</td>
<td>12.6 (2.0)*</td>
</tr>
<tr>
<td>Middle Disc Height (mm)</td>
<td>6.6 (2.5)</td>
<td>12.4 (2.2)*</td>
<td>11.9 (2.5)*</td>
<td>11.6 (2.4)*</td>
<td>11.3 (2.4)*</td>
<td>10.6 (2.3)*</td>
</tr>
<tr>
<td>Posterior Disc Height (mm)</td>
<td>4.7 (2.2)</td>
<td>8.6 (1.9)*</td>
<td>8.0 (1.7)*</td>
<td>7.6 (1.6)*</td>
<td>7.2 (1.6)*</td>
<td>6.9 (1.5)*</td>
</tr>
<tr>
<td>Neuroforaminal Height (mm)</td>
<td>14.3 (4.0)</td>
<td>20.3 (3.9)*</td>
<td>19.8 (3.7)*</td>
<td>18.9 (3.5)*</td>
<td>18.2 (3.2)*</td>
<td>17.5 (3.2)*</td>
</tr>
<tr>
<td>Segmental Lordosis (°)</td>
<td>4.6 (3.4)</td>
<td>9.8 (3.7)*</td>
<td>9.4 (3.2)*</td>
<td>9.1 (3.1)*</td>
<td>8.7 (2.7)*</td>
<td>8.6 (2.5)*</td>
</tr>
<tr>
<td>Lumbar Lordosis (°)</td>
<td>39.9 (8.8)</td>
<td>47.6 (7.2)*</td>
<td>46.6 (6.4)*</td>
<td>46.0 (6.7)*</td>
<td>45.3 (6.7)*</td>
<td>44.0 (6.7)*</td>
</tr>
</tbody>
</table>
Results: Clinical Outcomes

Mean VAS back pain and ODI is shown. The results show a significant decrease from baseline and sustained at 1.5, 3, 6, 12, and 24 months.
Results

• Mean PILL mismatch significantly improved from baseline by 4.7±8.7 degrees at 24 months (P<0.001)
Conclusion

• 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 resulted in significant radiographic improvement at 24 months based on increased disc height, neuroforaminal height and lordosis correction from baseline