Swallowing Function Following Anterior Cervical Discectomy and Fusion With and Without Anterior Plating: A SWAL-QOL and Radiographic Assessment

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Disclosures

Brittany E. Haws, Benjamin Khechen, Dil V. Patel, Mundeep S. Bawa, Harmeet S. Bawa, Jordan A. Guntin, Kaitlyn L. Cardinal, Andrew M. Block—Nothing to disclose

Kern Singh, MD

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Introduction

- The use of anterior plating in anterior cervical discectomy and fusion (ACDF) is associated with improved postoperative outcomes compared to stand-alone cages.

- However, concerns exist regarding increased rates of postoperative dysphagia following an ACDF with use of anterior plating.
Aims and Objectives

• To quantify the effect of anterior plating on swallowing function as defined by the SWAL-QOL questionnaire following a primary, single-level ACDF.
Methodology

Study Population: Patients who underwent single-level MIS TLIF

68 primary, single-level ACDF patients

- Stand-alone cage
  - N = 41
- Cage with Anterior Plating
  - N = 27
Methodology

• **Variables Analyzed**
  - Patient demographics
  - Surgical Technique
  - Perioperative Variables
  - Complications

• **Outcomes**
  - Radiographic
  - SWAL-QOL

• **Statistical Analyses**
  - Student’s t-test
  - Pearson’s Chi-square analysis
Methodology

**Swelling Index:** $\frac{B}{A} \times 100\%$

**Air Index:** $\frac{C}{A} \times 100\%$

A: AP diameter of vertebral body
B: Anterior cortex of vertebral body to posterior wall of trachea
C: AP diameter of tracheal air window
No differences in baseline characteristics were identified between cohorts.

**Results**

**Table 1. Baseline characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Cage (N=41)</th>
<th>Plate (N=27)</th>
<th>( \dagger ) p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean ± SD, years)</td>
<td>46.3 ± 8.1</td>
<td>48.7 ± 9.5</td>
<td>0.275</td>
</tr>
<tr>
<td>Sex (n)</td>
<td></td>
<td></td>
<td>0.446</td>
</tr>
<tr>
<td>Female</td>
<td>31.7% (13)</td>
<td>40.7% (11)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68.3% (28)</td>
<td>59.3% (16)</td>
<td></td>
</tr>
<tr>
<td>Body Mass Index (n)</td>
<td></td>
<td></td>
<td>0.183</td>
</tr>
<tr>
<td>Non-obese (BMI &lt; 30)</td>
<td>48.8% (20)</td>
<td>65.4% (17)</td>
<td></td>
</tr>
<tr>
<td>Obese (BMI ≥ 30)</td>
<td>51.2% (21)</td>
<td>34.6% (9)</td>
<td></td>
</tr>
<tr>
<td>Smoking Status (n)</td>
<td></td>
<td></td>
<td>0.070</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>95.1% (39)</td>
<td>81.5% (22)</td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>4.9% (2)</td>
<td>18.5% (5)</td>
<td></td>
</tr>
<tr>
<td>Charlson Comorbidity Index (Mean ± SD)</td>
<td>0.9 ± 1.1</td>
<td>1.4 ± 1.2</td>
<td>0.103</td>
</tr>
</tbody>
</table>

SD = Standard deviation

\( \dagger \) p-values calculated using Student’s t-test and chi square analysis
No differences in intraoperative characteristics, length of stay, and complications.
Results

Table 3. SWAL-QOL Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Cage (N=41)</th>
<th>Plate (N=27)</th>
<th>†p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWAL-QOL (Mean ± SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preoperative</td>
<td>93.3 ± 8.1</td>
<td>95.6 ± 7.5</td>
<td>0.245</td>
</tr>
<tr>
<td>6-week Postoperative</td>
<td>89.2 ± 14.1</td>
<td>93.5 ± 7.1</td>
<td>0.149</td>
</tr>
<tr>
<td>12-week Postoperative</td>
<td>89.5 ± 13.0</td>
<td>92.4 ± 10.4</td>
<td>0.387</td>
</tr>
<tr>
<td>Changes in SWAL-QOL (Mean ± SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preoperative</td>
<td>93.3 ± 8.1</td>
<td>95.6 ± 7.5</td>
<td>--</td>
</tr>
<tr>
<td>Δ 6-week Postoperative</td>
<td>-4.1 ± 12.4</td>
<td>-2.1 ± 8.0</td>
<td>0.457</td>
</tr>
<tr>
<td>Δ 12-week Postoperative</td>
<td>-3.1 ± 11.7</td>
<td>-3.0 ± 12.0</td>
<td>0.974</td>
</tr>
</tbody>
</table>

SD = Standard deviation
†p-value calculated using Student’s t-test.

No differences in SWAL-QOL scores were observed at 6-week or 12-week postoperative.
The Plate cohort had a greater swelling index at 6-week follow-up. No differences in air indices at 6-week and 12-week follow-up.
Discussion

- Patients undergoing ACDF with anterior plating DO NOT experience greater postoperative swallowing dysfunction.

- Postoperative changes in radiographic swelling and air indices are similar regardless of instrumentation used.

- Anterior plating can be utilized in ACDF procedures WITHOUT concern for a higher risk of postoperative dysphagia.
Limitations

- Patients may have experienced more significant impairments earlier in their postoperative course that subsided prior to survey administration.

- SWAL-QOL survey is optimized for use in oropharyngeal oncologic and otolaryngology populations, sections of the survey regarding quality of life relating to severe swallowing dysfunction have limited utility among spine surgery populations.
Conclusions

• Patients that receive a cage with anterior plating DO NOT experience significant increases in dysphagia compared to patients that received a stand-alone cage.

• Use of anterior plating DOES NOT lead to greater radiographic swelling and air indices.

• Patients should be counselled to expect similar postoperative swallowing function following a primary, single-level ACDF regardless of instrumentation used.
References

THANK YOU!

Contact us about questions and membership opportunities

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