Long-term results of anterior cervical corpectomy and arthrodesis for cervical degenerative diseases with more than ten years of follow-up

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Purpose

• The purpose of this study was to elucidate the long-term results after anterior cervical corpectomy and arthrodesis and the detrimental factors affecting the results.

Disclosure information:
None of the authors has any potential conflict of interest.
Clinical Materials

• 25 cases with more than 10 years follow-up (ave. 13y 7m)

• Multilevel anterior cervical corpectomy and arthrodesis
  2 corpectomies: 10 cases, 3 corpectomies: 15 cases

• Age 16-64 y/o (ave. 51 y/o)

• 19 Males, 6 Females

• Cervical Spondylositic Myelopathy (CSM): 11 cases
  Cervical Ossification of Posterior Longitudinal Ligament (OPLL): 11 cases
  Cervical Spondylositic Amyotrophy (CSA): 3 cases
Anterior cervical corpectomy and arthrodesis

Goto, et al. SPINE 1993


Autogenous fibula strut or iliac bone was grafted

External fixation with Halo Vest
Methods

• JOA score

• Early and late complications

• Rate of bony union

• Adjacent Segment Diseases

• Detrimental factors affecting JOA score
Results: JOA score

<table>
<thead>
<tr>
<th>Time</th>
<th>JOA Score</th>
</tr>
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<tbody>
<tr>
<td>Before surgery</td>
<td>9.4</td>
</tr>
<tr>
<td>6mon</td>
<td>12.8</td>
</tr>
<tr>
<td>1yr</td>
<td>13.1</td>
</tr>
<tr>
<td>2yrs</td>
<td>13.7</td>
</tr>
<tr>
<td>3yrs</td>
<td>13.4</td>
</tr>
<tr>
<td>5yrs</td>
<td>12.8</td>
</tr>
<tr>
<td>10yrs</td>
<td>11.4</td>
</tr>
<tr>
<td>At the latest FU</td>
<td>10.5</td>
</tr>
</tbody>
</table>
Complications

• **Early Complications**
  Graft dislodgement or fracture: 3 cases
  C5 palsy: 3 cases
  Meningitis: 2 cases
  Recurrent laryngeal nerve palsy: 1 case

• **Late Complications**
  Lumbar spinal stenosis: 5 cases
  Thoracic myelopathy: 3 cases
  Alzheimer’s disease: 1 case
  Cerebral infarction: 1 case
  Carpal tunnel syndrome: 1 case
  Cubital tunnel syndrome: 1 case
Bony union and adjacent segment diseases

- Bony Union: 88% (22/25 cases)

- 2 of 3 pseudarthrosis cases had additional posterior fusion surgery

- No recurrence of myelopathy due to adjacent segment diseases
Discussion: Reports of long-term results

In cervical laminoplasty cases after 10 years

• 24% of the patients had neurologic deterioration.
  

• The average JOA score and recovery rates improved significantly until 3 years after surgery and were maintained at an acceptable level, with a slight deterioration after 5 years, especially in the OPLL patients.
  

In anterior cervical surgery cases after 10 years

• 10% had a 1-point decrease of the JOA score 5 years after surgery
  
Adjacent segment diseases after anterior cervical surgery

- 25.6% of the patients who had an anterior cervical arthrodesis would have new disease at an adjacent level within 10 years.

- Symptomatic adjacent-segment disease is the result of progressive cervical spondylosis at adjacent levels and is not caused by the arthrodesis itself.

  Hilibrand AS, et al. JBJS Am 1999

- ACDF (anterior cervical decompression and fusion) accelerates disc degeneration at the adjacent segments.

Adjacent segment diseases after multilevel corpectomy and arthrodesis

- The risk of symptomatic adjacent-segment disease following multi-level arthrodesis was significantly lower than that following single-level arthrodesis.  
  Hilibrand AS, et al. JBJS Am 1999

- Adjacent disc degeneration has minimal effects on the long-term clinical results after anterior long fusion.  

In our study

- **No recurrence of myelopathy** due to adjacent segment disease.
- The fact that the C3/4 and/or C4/5 disc levels were included in the fusion levels could have helped lower the risk of adjacent segment diseases.
Conclusions

• The long-term results after anterior cervical corpectomy and arthrodesis were favorable.

• The damaged spinal cord in cervical myelopathy cases appeared to deteriorate, even after surgery, which might have affected the long-term results.

• Factors related to aging, not adjacent segment diseases, appeared to be the determinents of deterioration.