Clinical Outcomes of Multi-Level Posterior Cervical Foraminotomy for the Treatment of Cervical Radiculopathy

Dong Chan Lee, Choon Keun Park, Dong Geun Lee, Jong Yang Oh, Dong Hwan Lim, Dong Hwa Heo, Jang Hoe Hwang, Hyoung Sub Kim, Huk Keun Lee

Department of Neurosurgery
The Leon Wiltse Memorial Hospital
Suwon, Korea

Eurospine Liverpool, Oct. 2-4, 2013
E-Poster #P82
Clinical Outcomes of Multi-Level Posterior Cervical Foraminotomy for the Treatment of Cervical Radiculopathy

Presenter: Dong Chan Lee

Co-Authors:
- Choon Keun Park
- Dong Geun Lee
- Jong Yang Oh
- Dong Hwan Lim
- Dong Hwa Heo
- Jang Hoe Hwang
- Hyoung Sub Kim
- Huk Keun Lee

No Relationships

Eurospine 2013 Liverpool

a. Grants/Research Support
b. Consultant
c. Stock/Shareholder
d. Royalties
e. Other Financial Report
Posterior Foraminotomy

- Modified by Scoville (1946)
- Avoiding fusion and all the complications associated with it
- Preserves mobility of the motion segment
- Reduces the risk of adjacent segment degeneration
- Avoids the risk of injury of the anterior neurovascular and visceral structures, such as trachea, esophagus, carotid artery and recurrent laryngeal nerve
- Cervical spine maintains its stability if less than 50% of the facet joint is resected bilaterally after laminectomy (J Bone Joint Surg Am 74:22-47, 1992)
- A safe procedure associated with a very low rate of complication: 0-4%
Multi-level ACDF

• Most popular and familiar procedure in multi-level degenerative cervical disease.

• **Adjacent segment degeneration**
  - Degeneration around fusion segment: 81%
  - 25% incidence of secondary operation in 10 years by Hilibrand

• **Risk of injury of the anterior neurovascular and visceral structures**, such as trachea, esophagus, carotid artery and recurrent laryngeal nerve

• Multi-level ACDF has lower fusion rate and worse clinical outcomes than single-level ACDF.
Objective

• The benefits of one-level posterior cervical foraminotomy have been recognized by several papers.
• However, reports of the efficacy of multi-level posterior cervical foraminotomy are rare.
• The aim of this study was to analyze the surgical outcomes of multi-level posterior cervical foraminotomy in patients with multi-level unilateral cervical radiculopathy.
Material and Method

Summary of baseline characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Cases/Value(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>no. of patients</td>
<td>36</td>
</tr>
<tr>
<td>no. of males</td>
<td>32 (88.9%)</td>
</tr>
<tr>
<td>levels of foraminotomy</td>
<td></td>
</tr>
<tr>
<td>2 level</td>
<td>33 (91.7%)</td>
</tr>
<tr>
<td>3 level</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>4 level</td>
<td>1 (2.8%)</td>
</tr>
<tr>
<td>mean age (yrs) at op.</td>
<td>55.4 (42-71)</td>
</tr>
<tr>
<td>mean F/U duration(mos)</td>
<td>44.4 (36-64)</td>
</tr>
<tr>
<td>preop. symptom</td>
<td></td>
</tr>
<tr>
<td>pure radiculopathy</td>
<td>26 (72.2%)</td>
</tr>
<tr>
<td>radiculopathy with neck pain</td>
<td>10 (27.8%)</td>
</tr>
<tr>
<td>preop. weakness</td>
<td>8 (22.2%)</td>
</tr>
<tr>
<td>Operation (Total 76 level)</td>
<td></td>
</tr>
<tr>
<td>only foraminotomy</td>
<td>62 (81.6%)</td>
</tr>
<tr>
<td>foraminotomy with discectomy</td>
<td>14 (18.4%)</td>
</tr>
</tbody>
</table>
Material and Method

- Indication: multi-level unilateral radiculopathy caused by foraminal osteophytes or lateral disc herniations without instability and kyphosis.
- Clinical outcomes were retrospectively assessed according to VAS, NDI, and Odom’s criteria.
- The change of VAS and NDI was analyzed by Wilcoxon signed rank test.
Clinical Results

Odom's criteria

NDI

arm pain

neck pain

* P<0.05
Complication

- Transient postoperative neck pain: 4 cases (11.1%)

- Contralateral radicular symptom after 1 year: 1 case (2.8%)
  - Improvement after ACDF at same level

- Dural injury or neural deficit: 0 case

- No evidence of postoperative progression of kyphosis or instability, and no surgery-related complications
Case I 53/M Foraminal stenosis C34567 Lt.
Case II 46/F
Foraminal stenosis C67 Rt. & Foraminal HNP C7T1 Rt.

Preop. vs. Postop.
Conclusion

• Most patients treated with the multi-level posterior cervical foraminotomy experienced outcomes ranging from good to excellent.

• This procedure appears to be an acceptable alternative to ACDF for carefully selected patients with unilateral cervical radiculopathy.

• We suggest that posterior cervical foraminotomy is appropriate for patients who have undergone previous anterior cervical operation.

• The surgeon must consider the potential for a ruptured disc.