Cervical Myelopathy: Anterior Surgery is Best

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Royalties-Medtronic, Saunders Elsevier

Myelopathy: Surgical Options

- Anterior decompression & fusion:
  - Discectomies & interbody grafts
  - Corpectomies & strut grafts
  - Mixed Corpectomy/discectomy

- Posterior Surgery:
  - Laminectomy
  - Laminoplasty
  - Laminectomy & fusion

- Combined Ant./Post.
Anterior decompression and stabilization - Gold Standard

- Direct decompression of ventral cord
- Direct and indirect foraminal decompression
- Restoration of cervical lordosis


Multi-level Corpectomy Reconstruction Failure Rate

<table>
<thead>
<tr>
<th></th>
<th>2 level</th>
<th>3 level</th>
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<tr>
<td>Vaccaro</td>
<td>9%</td>
<td>50%</td>
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<tr>
<td>Sasso</td>
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<td>71%</td>
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Posterior Approaches

Laminectomy
Laminoplasty
Laminectomy + Fusion

Post-laminectomy Cervical Kyphosis
Laminoplasty: Pre-op alignment

- No Decompressive effect when cervical lordosis less than 10 degrees
- Cord bowstrings against anterior osteophytes
  Yamazaki Spine 1999

Laminoplasty Long-term F/U

- Delayed neurologic deterioration
  - Progressive Kyphosis
  - Progression of OPLL
  Iwasaki Spine 2007
Laminoplasty Long-term F/U

- 5-yr postop
- Progressive Kyphosis
- 30% patients

Saruhashi JOSDT 1999

An Evidence-Based Stepwise Surgical Approach to Cervical Spondylotic Myelopathy: A Narrative Review of the Current Literature

“In patients with straightened spine” (loss of lordosis):
- limited involved levels (1 or 2), ACDF with a plate is recommended
- multiple involved levels should undergo posterior decompression and fusion

Are There Differences in The Progression of Ossification of the Posterior Longitudinal Ligament Following Laminoplasty Versus Fusion? A Meta-Analysis

**OPLL progression**
- 62.5% for the Laminoplasty group
- 7.6% for the fusion group
- Laminoplasty frequently induces progression of OPLL compared with fusion surgery
Lee et al: *Spine* 2016
Cervical sagittal imbalance is a preoperative risk factor for kyphotic deformity after Laminoplasty

- Despite lordotic alignment- cervical sagittal imbalance (Sagittal Vertical Axis) leads to postoperative kyphotic deformity after Laminoplasty
  Sakai CSRS 2013

T1 slope as a predictor of kyphotic alignment change after Laminoplasty in patients with cervical myelopathy

- Despite normal cervical lordosis-a high T1 slope leads to postoperative kyphotic deformity after Laminoplasty
  Kim CSRS 2013
Impact of preoperative cervical sagittal balance on surgical treatment for cervical spondylotic myelopathy caused by ossification of the posterior longitudinal ligament

• “Laminoplasty is NOT suitable for patients with cervical myelopathy caused by OPLL who have cervical sagittal imbalance, even in cases with normal preoperative alignment.”
  Sakai CSRS 2016

The K-line Tilt

• Laminoplastic is NOT suitable for patients with a K-line tilt >20 degrees. Even in cases with normal preoperative alignment.
  Sakai CSRS 2016
Surgical Strategy: Multilevel OPLL

- 75 pts severe OPLL: > 3 levels, > 40% canal dia.
  - 22 Ant. Corpectomy and fusion
  - 28 Post. Lam. and instrumented fusion
  - 25 Laminoplasty
- Lordosis better with Corp. and Lam+fusion
  - Laminoplasty higher rate of kyphosis (7/25)
- JOA Neuro better with Corp. and Lam+fusion
  - Laminoplasty only group with neuro worse (4/25)
- CSF leak: main complication Ant approach
- C5 palsy: main complication Post approach
- Axial pain: main complication Laminoplasty

CSM: Factors associated with perioperative complications

- 302 patients from the Prospective Multicenter AO Spine North American cervical spondylotic myelopathy study
- Posterior approach: higher infection rate
- Anterior approach: higher dysphagia
- C5 palsy: equal ant. vs. post.
- Complications sig. assoc. with increased OP time; EBL
- Not assoc with age, BMI, smoking, prior surg. or number of levels

Fehlings J NeuroSurg Spine 2012