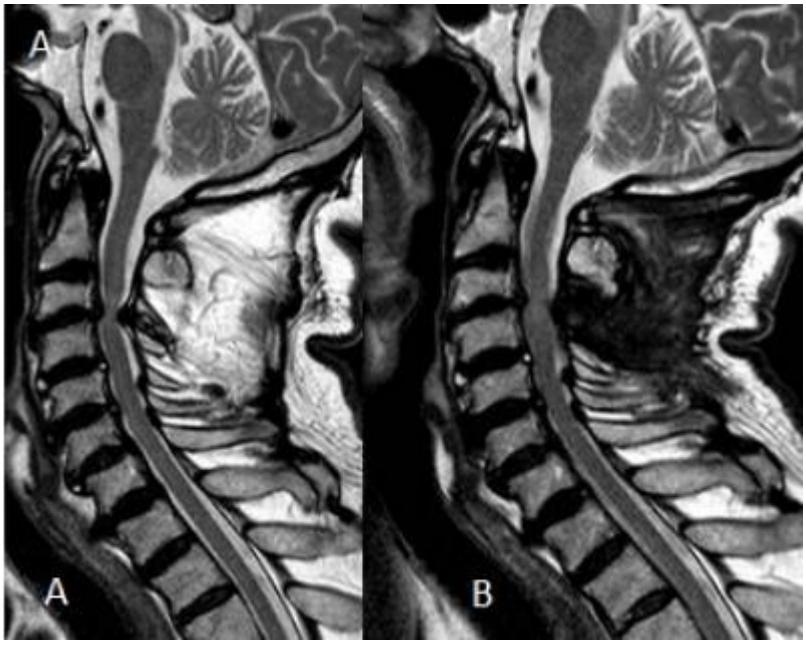
Posterior cervical decompression

Indications

Not typically used for a herniated cervical disc, more common for cervical spinal stenosis, OPLL

- without posterior fusion
- with lateral mass fusion



b) keyhole laminotomy: sometimes permits removal of disc fragment

Usually reserved for the following conditions:

multiple cervical discs or osteophytes (anterior cervical discectomy (ACD) is usually used to treat only 2, or possibly 3, levels without) with myelopathy.

where the anterior pathology is superimposed on cervical stenosis, and the latter is more diffuse and/or more significant

in professional speakers or singers where the 4% risk of permanent voice change due to recurrent laryngeal nerve injury with ACD may be unacceptable.

Laminectomy and facetectomy are commonly used surgical procedures for decompressing cervical spinal stenosis. Resection of the posterior structures causes instability and affects the internal stresses of the cervical spinal components. However, the influence of these surgical procedures on the biomechanical responses of the cervical spine has not been studied.

A nonlinear finite element model of the intact C2-C7 was constructed and validated. Ten surgically altered models were created from the intact model and were tested under physiologic loading.

Because of the inclusion of five motion segments, it was possible to determine the intersegmental responses and internal cortical shell and disc stresses in the adjacent altered and unaltered spinal components.

Under combined flexion and extension, intersegmental motions at C4-C5 and C5-C6 increased significantly after C5 laminectomy. Subsequent facetectomy performed at C5 and C6 on the laminectomized model only affected the responses at the C5-C6 segment. Overall, slight intersegmental responses of up to 5% were observed at the adjacent levels of C3-C4 and C6-C7. Laminectomy did not cause any significant increase in the intersegmental motions under lateral bending and axial rotation. Extending the surgical procedures to unilateral and bilateral facetectomy only increased the intersegmental motions slightly. Similar increases in the intervertebral disc and the cortical shell stresses were observed. These findings may partially explain the clinical observations of enhanced osteophytes formation.

This study provides a better understanding of the surgically altered cervical spinal biomechanics and may help formulate treatment strategies such as spinal implants [1)].

Its a posterior cervical spine surgery, for cervical spinal stenosis. The spine surgeon removes a small section of the lamina to relieve compression on the nerve. The remaining spinal bones are connected back together with titanium metal rods and screws.

The skin incision is in the midline of the back of the neck and is about 3 to 4 inches long. The paraspinal muscles are then elevated from multiple levels. Removal of the lamina. A high-speed burr can be used to make a trough in the lamina on both sides right before it joins the facet joint. The lamina with the spinous process can then be removed as one piece (like a lobster tail). Removal of the lamina and spinous process allows the spinal cord to float backwards and gives it more room.

Cervical laminectomy resulted in the greatest increase in global cervical ROM. Resection of the intraspinous and supraspinous ligaments [ISLs).ISLs at C2-3 and C7-T1 increased segmental ROM at these specific levels to a similar extent that laminectomy increased ROM at each cervical level. This segmental ROM may contribute to pain or postprocedural deformity and highlights the importance of the ISLs at the terminal ends of the cervical open door laminoplasty (ODL) [2)].

Complications

Cervical laminectomy complications.

Position

Prone, some use pin head holder

Equipment

a) C-arm

b) high speed drill

3. implants: cervical lateral mass screws and rods if fusion is being done

4. neuromonitoring: some surgeons used SSEP/MEP: Use of intra-op EP monitoring during a routine surgery for CSM or cervical radiculopathy is not recommended as an indication to alter the surgical plan or administer steroids since this paradigm has not been observed to reduce the incidence of neurologic injury (Level D Class III).

5. consent (in lay terms for the patient—not all-inclusive):

a) procedure: surgery through the back of the neck to remove the bone over the compressed spinal cord and nerves and possibly to place screws and rods to fuse the boned together

b) alternatives: nonsurgical management, surgery from the front of the neck, posterior surgery without fusion, laminoplasty

c) complications: nerve root weakness (C5 nerve root is the most common), may not relieve symptoms, further surgery may be needed, possible seizures with MEPs. If fusion is not done, there is a risk of progressive bone slippage, which would require further surgery.

Posterior cervical decompression and fusion

Posterior cervical decompression and fusion.

1)
Hong-Wan N, Ee-Chon T, Qing-Hang Z. Biomechanical effects of C2-C7 intersegmental stability due to laminectomy with unilateral and bilateral facetectomy. Spine (Phila Pa 1976). 2004 Aug 15;29(16):1737-45; discussion 1746. PubMed PMID: 15303016.
2)
Healy AT, Lubelski D, West JL, Mageswaran P, Colbrunn R, Mroz TE. Biomechanics of open-door laminoplasty with and without preservation of posterior structures. J Neurosurg Spine. 2016 May;24(5):746-51. doi: 10.3171/2015.7.SPINE15229. Epub 2016 Jan 22. PubMed PMID: 26799115.