ERNIE DISCALI E STENOSI FORAMINALI CERVICAL
(Cervical disc herniation and foraminal stenosis)

STENOSI FORAMINALI
Discectomia e artrodesi
(Discectomy and Arthrodesis)

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Websites: www.formazioneesostenibile.it - www.romespine.org
The foramen:
Anterior wall - Uncovertebral joints
Posterior wall – Facet joints

From Spinal Channel to the Vertebral Channel
Foraminal Stenosis in Cervical spine:

1) Lateral disc fragment;
2) Lateral anterior osteophyte
3) Hypertrophic cervical joint
4) Associated to degenerative deformity

(B) T2-weighted axial MR image in case with impingement against VNR (arrow)
Operations for foraminal decompression:

Anterior Approach:

1) Discectomy and fusion
2) Laterlal anterior approach - Microsurgical - Endoscopic
3) Disc Prosthesis(?)

Posterior Approach:

1) Posterior Microlaminotomy-foraminotomy (Key-Hole) -Microsurgical -Endoscopic
Posterior Approach:

Scoville ‘51
Frykholm ‘65
Fager ‘76
Williams ‘83
Henderson ‘83
Aldrich ‘90
Hudgins ‘90

Indications

A significant lateral (foraminal) Soft Disc Herniation.
Lateral Osteophytic Root compression.

Usually without fusion
The posterior cervical foraminotomy in the treatment of cervical disc/osteophyte disease: a single-surgeon experience with a minimum of 5 years’ clinical and radiographic follow-up
Clinical article
Jay Jagannathan, M.D., Jonathan H. Sherman, M.D., Tom Szabo, P.A.-C., Christopher I. Shaffrey, M.D., and John A. Jane Sr., M.D., Ph.D.
Department of Neurological Surgery, University of Virginia Health System, Charlottesville, Virginia

J Neurosurg Spine 10:000–000, 2009

Conclusions. The posterior cervical foraminotomy is highly effective in treating patients with cervical radiculopathy and results in long-lasting pain relief and improved quality-of-life outcomes in most patients. Long-term radiographic follow-up shows no significant trend toward kyphosis, although select patient subsets (patients older than 60 years, patients who had previous posterior surgery, and patients with < 10° of lordosis preoperatively) appear to be at higher risk and require closer follow-up.
Cervicothoracic radiculopathy treated using posterior cervical foraminotomy/discectomy

JAMES S. HARROP, M.D., MARCO T. SILVA, M.D., ASHWINI D. SHARAN, M.D., STEVEN J. DANTE, M.D., AND FREDERICK A. SIMEONE, M.D.

Department of Neurosurgery, Thomas Jefferson University, Philadelphia, Pennsylvania


Zdeblick, et al., demonstrated that with less than 50% resection of the facet joint strain, torsional stiffness, and flexion were maintained.
Minimally Invasive Cervical Spine Foraminotomy and Lateral Mass Screw Placement

Mark M. Mikhael, MD, * Paul C. Celestre, MD, * Christopher F. Wolf, MD, * Tom E. Mroz, MD, † and Jeffrey C. Wang, MD *
Full-Endoscopic Cervical Posterior Foraminotomy for the Operation of Lateral Disc Herniations Using 5.9-mm Endoscopes. A Prospective, Randomized, Controlled Study
Sebastian Ruetten, MD, PhD,* Martin Komp, MD, PhD,* Harry Merk, MD,† and Georgios Godolias, MD‡

- The clinical results of the full-endoscopic posterior cervical foraminotomy are equal to those of the conventional microsurgical anterior decompression and fusion. At the same time, there are advantages in the operation technique and reduced traumatization.
- Indications for the full-endoscopic posterior cervical foraminotomy are radicular arm pain due to lateral disc herniation.
- The full-endoscopic technique is a sufficient and safe supplement and alternative to conventional microsurgical procedures.
- Open and maximally-invasive procedures are necessary in spinal surgery and must be mastered by surgeons so that they also overcome problems and complications encountered when performing full-endoscopic procedures.

Microendoscopic posterior cervical laminoforaminotomy for unilateral radiculopathy: results of a new technique in 100 cases.
Tim E. Adamson, M.D.
Journal of Neurosurgery: Spine Jul 2001 / Vol. 95 / No. 1, Pages 51-57
Posterior approach for Foraminal Decompression:

**Advantages:**
1) No important complications;
2) No lesion of the disc
3) No significant Kyphosis
4) ROM =

**Disadvantages:**
1) Muscular trauma (midline approaches)
2) Venous bleeding
3) Difficulty in presence of anterior osteophytes
Anterior Approaches:

Discectomy and Fusion

In the anterior median approach we can remove lateral disc fragment and osteophythes.

Arthrodesis: the cage (or bone) open the space and allows foramen opening.

In lateral disc herniation, TDR, may be a correct indication.
Anterior cervical discectomy and interbody fusion by endoscopic approach: a preliminary report

JIANGWEI TAN, M.D., YANPING ZHENG, M.D., LIANGTAI GONG, M.D., XINYU LIU, M.D., JIANMIN LI, M.D., AND WEI DU, M.D.

Department of Orthopedic Surgery, Qilu Hospital, Shandong University, Jinan, Shandong, People’s Republic of China

J Neurosurg Spine 8:17–21, 2008
For foraminal decompression, it is important to remove uncovertebral joints. May be useful a contralateral approach.

Persistent C7 radicular pain after anterior decompression in a cervical spondylotic myelopathy case.

Advantages
1) Good Lordosis
2) Indirect Decompression
3) Habitual Approach

Disadvantages
1) < ROM
2) Difficulty in extreme lateral decompression
Lateral (minimal) anterior approach: Microsurgical


Decompression via microsurgical anterior foraminotomy for cervical spondylotic myelopathy

HAE-DONG JHO, M.D., PH.D.

Microsurgical anterior cervical foraminotomy for radiculopathy: a new approach to cervical disc herniation.

HAE-DONG JHO, M.D., PH.D.
Failed anterior cervical foraminotomy
ROBERT J. HACKER, M.D., AND CHRISTOPHER G. MILLER, M.D.
Oregon Neurosurgery Specialists, Eugene, Oregon
J Neurosurg (Spine 2) 98:126–130, 2003

FIG. 1. Left: Sagittal image demonstrating recurrent left-sided C6–7 disc hernia following anterior cervical foraminotomy. Right: Axial image. Note the enlargement of the neural foramen postoperatively on the left side as well as recurrent disc herniation.

FIG. 2. Left: Anteroposterior radiograph obtained after right-sided C5–6 anterior cervical foraminotomy. Note subtle tilt to ipsilateral side. Center: Lateral radiograph revealing marked degenerative disc disease at C5–6 and C6–7. Right: Lateral radiograph obtained in the same patient after C-6 corpectomy and exploration of the right C5–6 foraminotomy site.

HACKER, et al., have retrospectively reviewed 23 patients who underwent anterior cervical foraminotomy between 1998 and 2000. Seven (30%) of 23 patients required additional surgery and only 12 patients (53%) experienced a good or excellent outcome.
Fager and Johnson criticized the Jho technique because it was not original and for the possibility of vertebral artery lesions.

Does this approach spare the disc?
Transpedicular approaches to cervical uncovertebral osteophytes causing radiculopathy


Department of Neurosurgery, Frenchay Hospital, Bristol, United Kingdom
Lateral minimal anterior approach: -Endoscopic


Endoscopic anterior cervical foraminotomy for unilateral radiculopathy: anatomical morphometric analysis and preliminary clinical experience

WALTER F. SARINGER, M.D., BRIAN REDDY, M.D., IRIS NÖBAUER-HUHMANN, M.D., RENE REGATSNCHIG, M.D., MARION REDDY, M.D., MANFRED TSCHABITSCHER, M.D., AND ENGELBERT KNOSP, M.D.

Departments of Neurosurgery and Radiology

J Neurosurg (Spine 2) 98:171–180, 2003
Minimal Lateral Endoscopic or Microsurgical Approach:

Disavantages:
- Vertebral artery lesions;
- Possibility instability
- S. di Bernard-Horner
- Disc degeneration?; Recurrences?; Kiphosys?

Advantages:
- Minimally Invasive Approach;
- No fusion
Cervical spondylosis with unilateral upper extremity amiotrophy, 3 levels foraminal right stenosis

1) 3 levels Key-Hole: muscular pain; kiphosys
2) Lateral minimal anterior app.: kiphosys, Instability.
3) Discectomy and fusion (plate?): may difficult extreme lateral decompression.
Conclusion:

- Anterior Discectomy and Fusion: -Good decompression-opening of the disc space-<ROM.
- Anterior lateral approach:-Good decompression-=ROM-Kyphosis-Instability
- Posterior Key-Hole:-Muscolar pain-difficulty in presence of anterior ostheofytes;=ROM
Thanks