Cervical Spine Radiculopathy: Convervative Treatment

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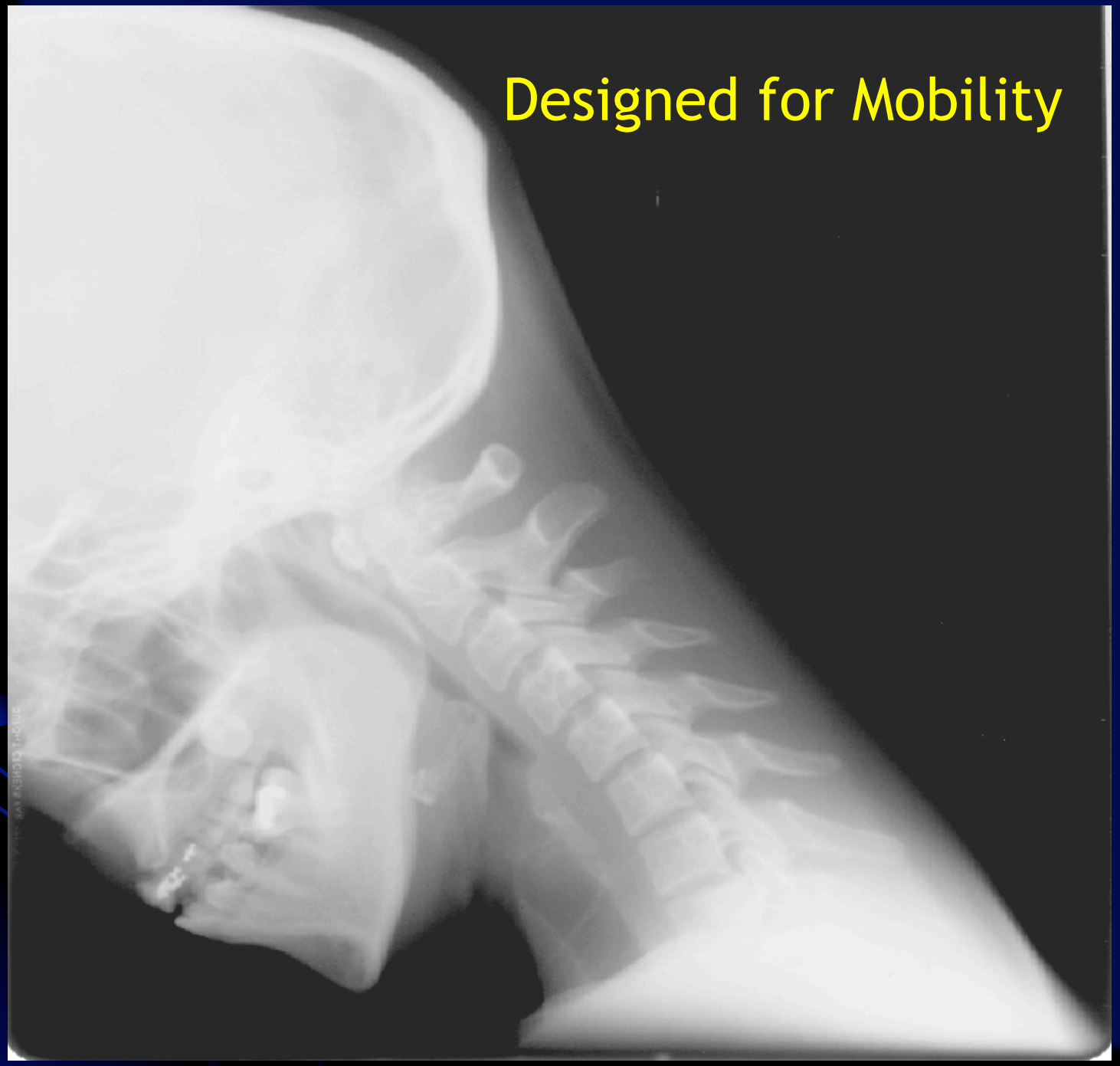
Designed for Mobility



Cervical Spine Pathology: Patterns of Presentation

- Cervical pain
- Cervical radiculopathy
- Cervical spondylosis
- Cervical myelopathy

Pathoanatomical Patterns of Presentation

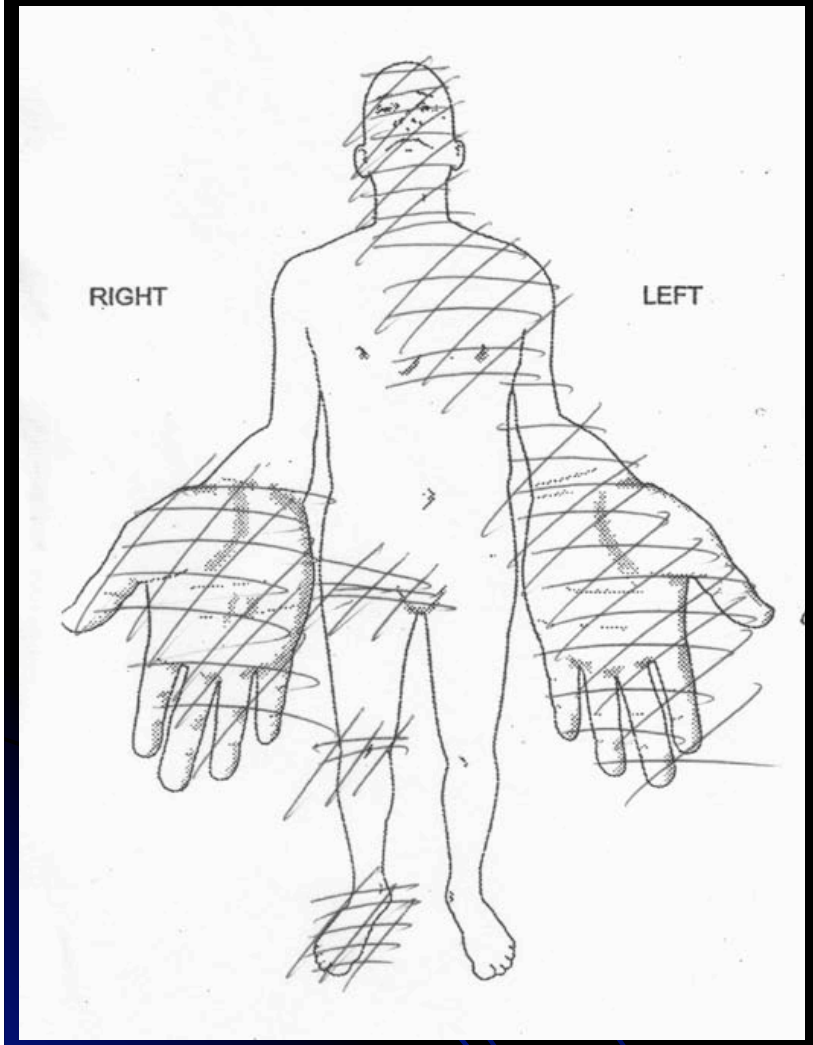
1. Unilateral Soft Disc Extrusion
2. Central Disc with Cord Compression
3. Spondylosis with Radiculopathy
4. Spondylosis with Myelopathy

Spinal nerve and cord compression

Myelopathy
Spondylosis 70%–75%

C5-C6 Disc prolapse
HNP 20%–25%

Cervical Radiculopathy



- the absence of radiating symptoms in a dermatomal distribution does not rule out the presence of symptomatic root compression.
- crossover between myotomes and dermatomes may be present.

Cervical Radiculopathy: Natural History

Cervical Radiculopathy: Natural History

- The idea that progressive disability will necessarily develop in the untreated individuals is not supported by reliable evidence.
- The disease not only can remain static for lengthy periods, but sometimes patients with severe disability also can improve without treatment.
- The widespread belief that overt myelopathy will eventually develop in patients with radicular symptoms also is not based on good evidence.

MRI evidence of nerve root compression
may occur in 19% of asymptomatic individuals.

The diagnosis is made only by matching clinical signs
and symptoms with the radiologic abnormality.

Regression of Cervical Disc Herniation Observed on MRI

Mochida, Spine 1998

- 38 patients with cervical disc herniation
- repeated MRI
- In 15 patients (40%), the volume of herniated material was decreased
- The interval from onset of symptoms to the initial examination was significantly shorter in the herniation regression group.
- Cervical disc herniation with migration most frequently exhibit spontaneous regression.
- All of the patients with *radicular pain* and upper limb *amyotrophy* were treated successfully with conservative therapy.

Natural History

Papers and Originals

NATURAL HISTORY AND PROGNOSIS OF CERVICAL SPONDYLOSIS

BY

F. LEES, M.B., Ch.B., M.R.C.P., D.C.H. J. W. ALDREN TURNER, D.M., F.R.C.P.

From the Department of Neurology, St. Bartholomew's Hospital, London

Lees F, Turner JW: Natural history and prognosis of cervical spondylosis. *Br Med J* 1963;2:1607-1610.

Natural history and prognosis of cervical spondylosis.
Lees F, Turner JW. *Br Med J* 1963;2:1607-1610.

51 patients with radiculopathy
2-19 years follow- up

- 45% only a single episode of pain without recurrence
- 30% mild symptoms,
- 25% had persistent or worsening symptoms

No radiculopathic patient progressed to myelopathy

Myelopathy: Natural History
Clarke and Robinson (*Brain* 79:483, 1956)

120 patients

75% episodic worsening of symptoms and signs.
2/3 of those ongoing deterioration between the acute clinical episodes.
1/3 stabilized between the episodes.

20% slow steady progression without periods of remission.

5% rapid onset and progression of signs and symptoms to a point of stabilization.

Although the course may be slow, the prognosis is poor and true improvement is rare.

Principles of Treatment

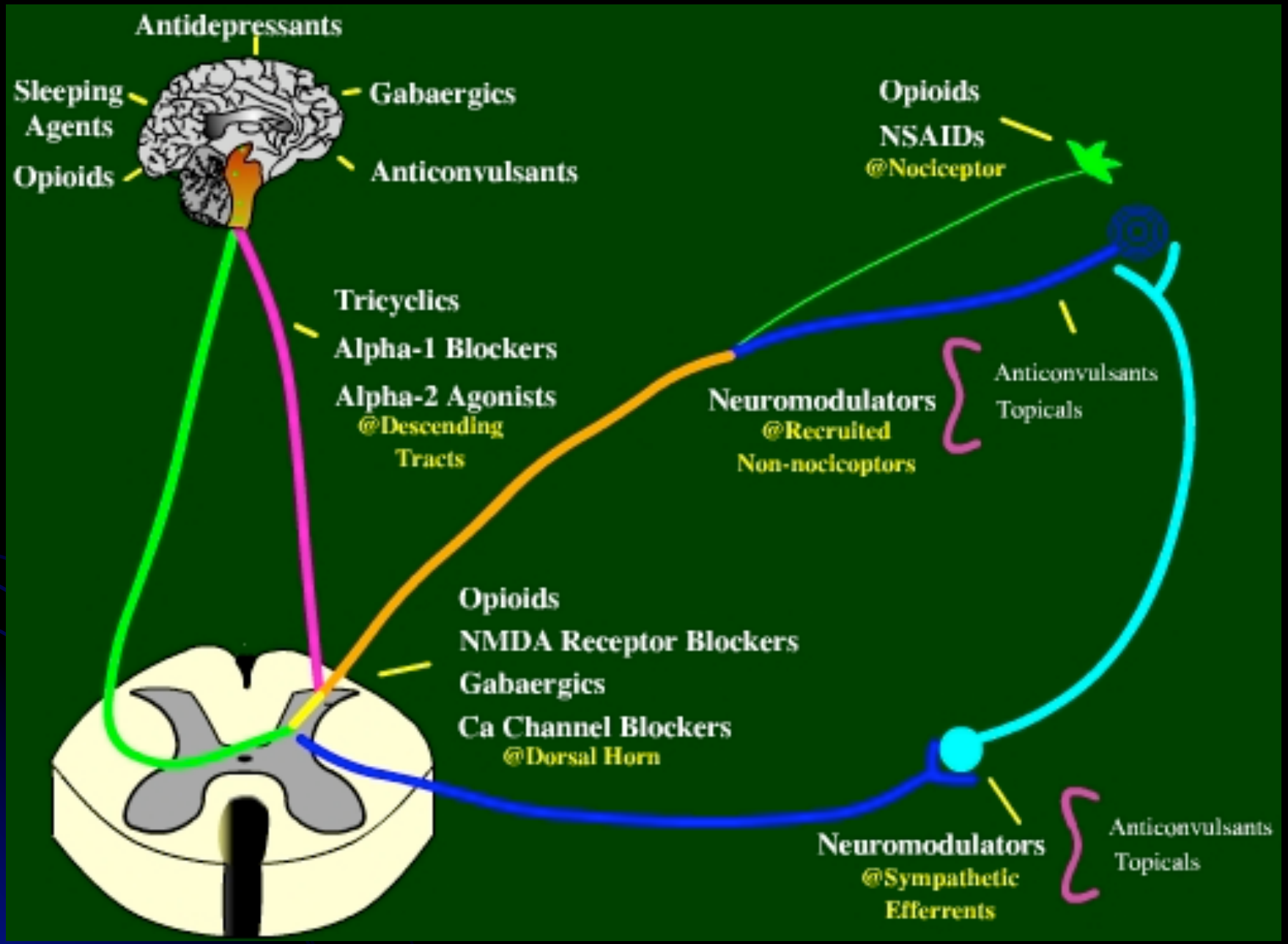
First, do not harm.

Nonsurgical Regimens

- Physical therapy
- Modalities
- Traction
- Medication
- Manipulation
- Immobilization

- The literature does not define a regimen of effective nonsurgical care.
- There are no controlled trials comparing the various nonsurgical regimens versus the natural history (ie, no treatment at all).
- It remains unclear whether nonsurgical management actually improves on the natural history of the disorder or simply treats the symptoms as the disorder runs its course.

Sites of Actions of Medications



Medications

- NSAIDS
- Muscle relaxants:
  - re-establish sleep patterns
  - more useful in myofascial/muscular pain
- Narcotics: rarely indicated
- Antidepressants & anticonvulsants:
  chronic neuropathic pain
- Steroids: acute radiculitis
- Non-narcotic analgesics: tramadol

Soft cervical collar

- Only for acute soft tissue neck injuries and for short periods of time (ie, not to exceed 3-4 days' continuous use).
- Even in patients without radiculopathy who have only neck pain, soft collars have not demonstrated an effect on the duration or degree of neck pain.
- Risks include limiting cervical ROM and losing neck strength.
- In foraminal stenosis reversal of the collar to promotes neck flexion, discourages extension, and opens the intervertebral foramina.

Home cervical traction

- Of unproven benefit for cervical radiculopathy.
- Anecdotally, intermittent home traction may help relieve symptoms by temporarily enlarging the neuroforaminal space and probably does not cause harm.
- Traction should be avoided in the patient with myelopathy to prevent stretching of a compromised spinal cord over a compressive lesion.

Cervical Traction

A few reports of substantial relief of radicular pain and improved functional outcome after the use of cervical traction for the treatment of cervical radiculopathy.

• Olivero et al. Results of halter cervical traction for the treatment of cervical radiculopathy: retrospective review of 81 patients. Neurosurg Focus. 2002;12:ECP1.

•Joghataei et al. The effect of cervical traction combined with conventional therapy on grip strength on patients with cervical radiculopathy. Clin Rehabil. 2004;18:879-87.

Cervical Manipulation

- Absence of objective evidence demonstrating any proven benefit.
- Risks
- *Not routinely recommended* in cervical radiculopathy.
- It should be avoided in the patient with known myelopathy.

Physical modalities

heat, cold, therapeutic ultrasound, massage, use of the TENS, and cervical traction were not found to have any reproducible benefit in the treatment of acute or chronic neck pain.

Philadelphia Panel evidence based clinical practice guidelines on selected rehabilitation interventions for neck pain. Phys Ther. 2001;81:1701-17.

Nonoperative Management of Herniated Cervical Intervertebral Disc With Radiculopathy. Saal et al. Spine 1996

- 26 patients
- Cervical HNP and radiculopathy with motor and sensory loss
- Follow-up time > 1 year
- symptom level, activity and function level, medication and ongoing medical care, job status, and satisfaction
- Management: traction, specific physical therapeutic exercise, NSAID's, patient education
- 24/26 managed conservatively

Cervical spondylotic myelopathy

- Nonoperative treatment with collar immobilization and modification of activities improves functional status in selected patients with mild cervical spondylotic myelopathy.
- Careful monitoring of these patients is necessary as neurological deterioration can occur in spite of this treatment.
- Early operative management is beneficial for most patients with moderate or severe myelopathy.

Rao JBJS Am, 2006

Relationships between outcomes of conservative treatment and MRI findings in patients with mild cervical myelopathy caused by soft disc herniations. Matsumoto et al., Spine. 2001;26:1592-8.

- 27 patients with mild to moderate myelopathy due to soft disc herniation.
- conservative management: rigid neck brace and restriction of activities.
- mean follow-up 3.9 years.

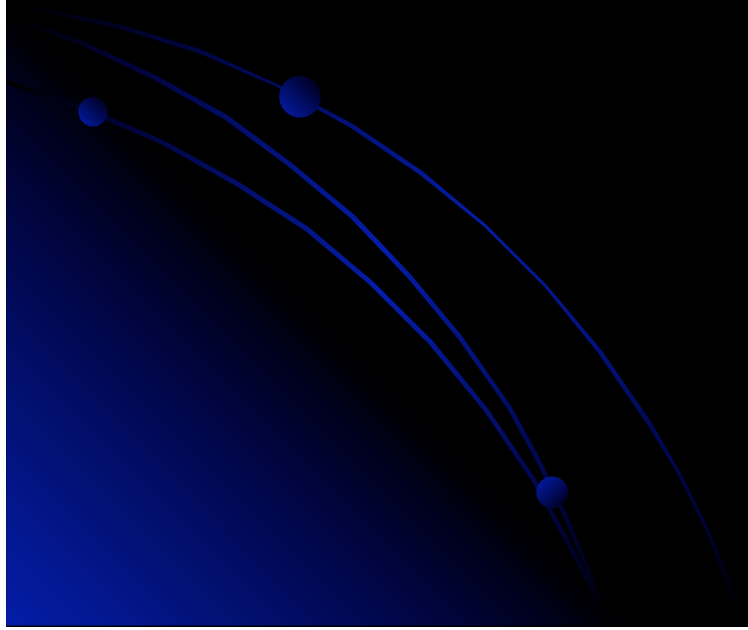
- 13 (63%) had improvement or stabilization of clinical function, and an operation was avoided.
- 10 (37%) neurologic deterioration or no improvement within 9 months.

Relationships between outcomes of conservative treatment and MRI findings in patients with mild cervical myelopathy caused by soft disc herniations. Matsumoto et al., Spine. 2001;26:1592-8.

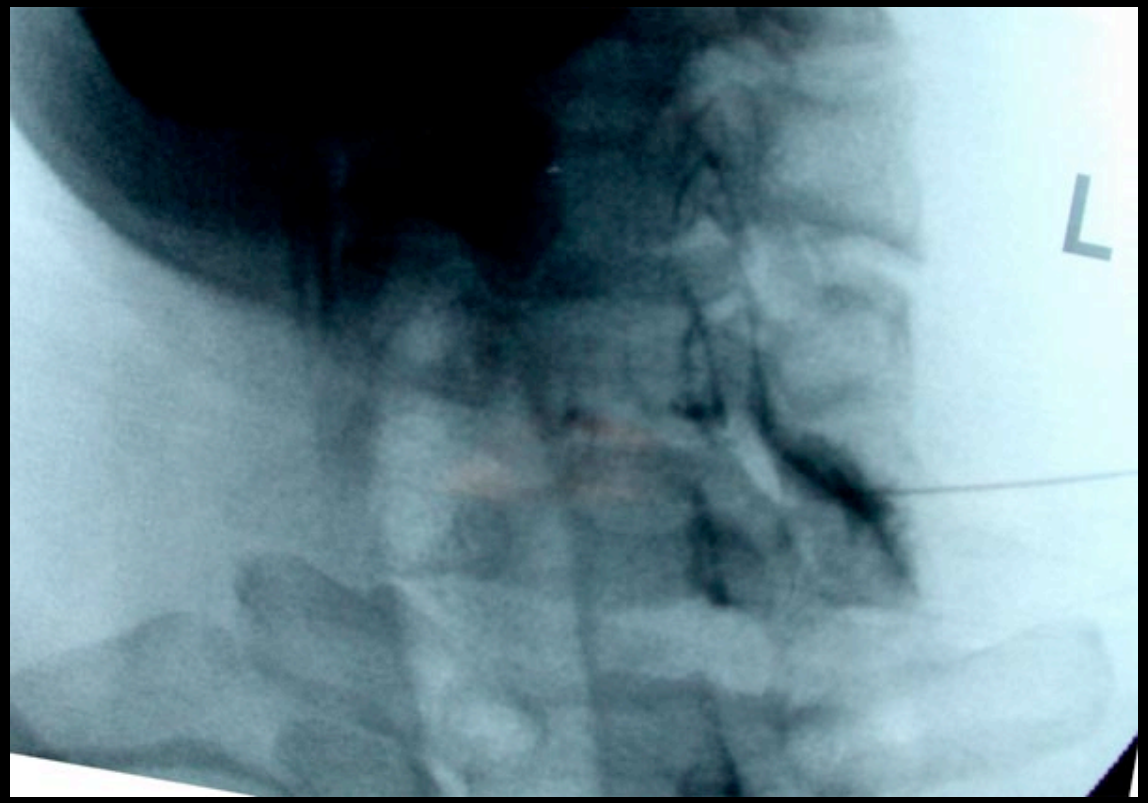
- Operatively and nonoperatively managed patients showed similar recovery at the time of the final follow-up

- A trial of nonoperative treatment did not decrease the potential for ultimate recovery of patients with mild myelopathy.

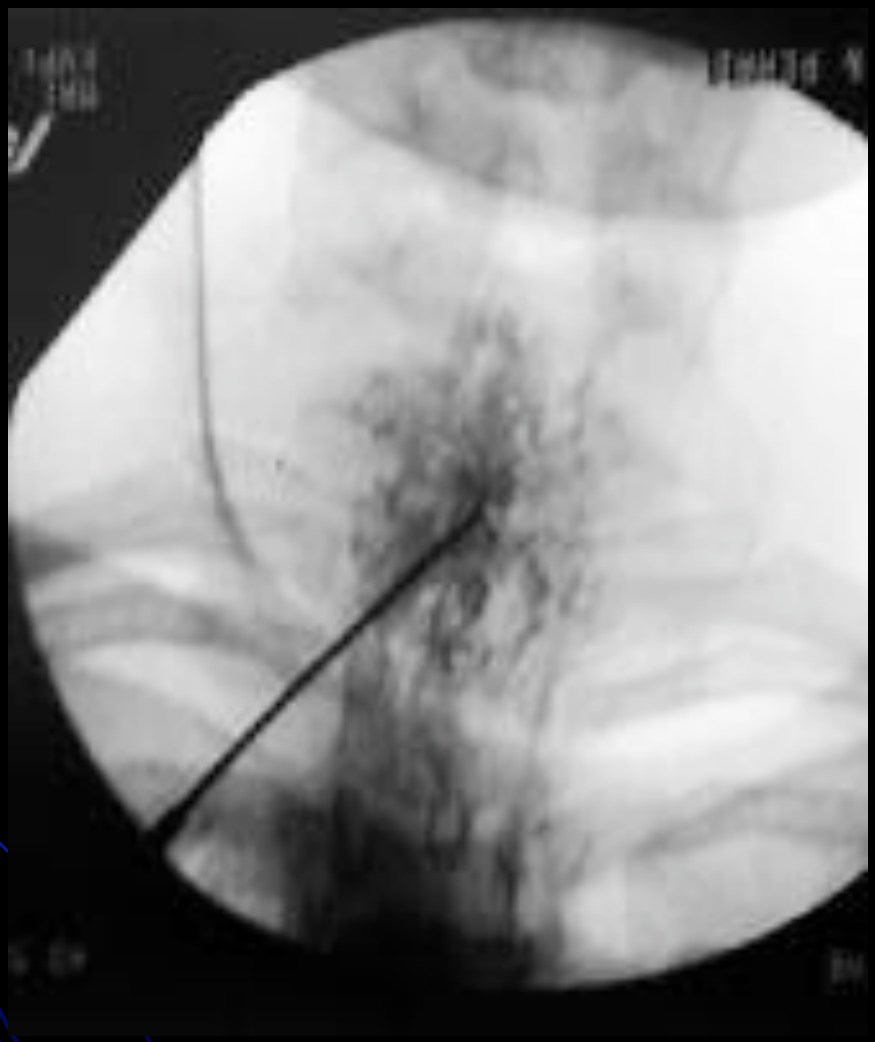
Percutaneous Techniques



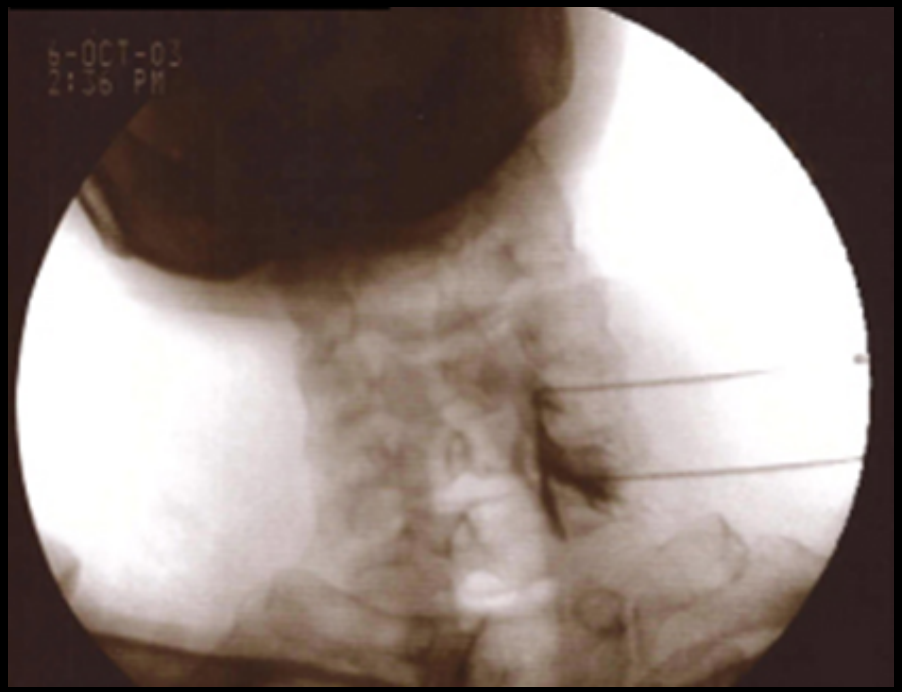
Epidural steroid injection



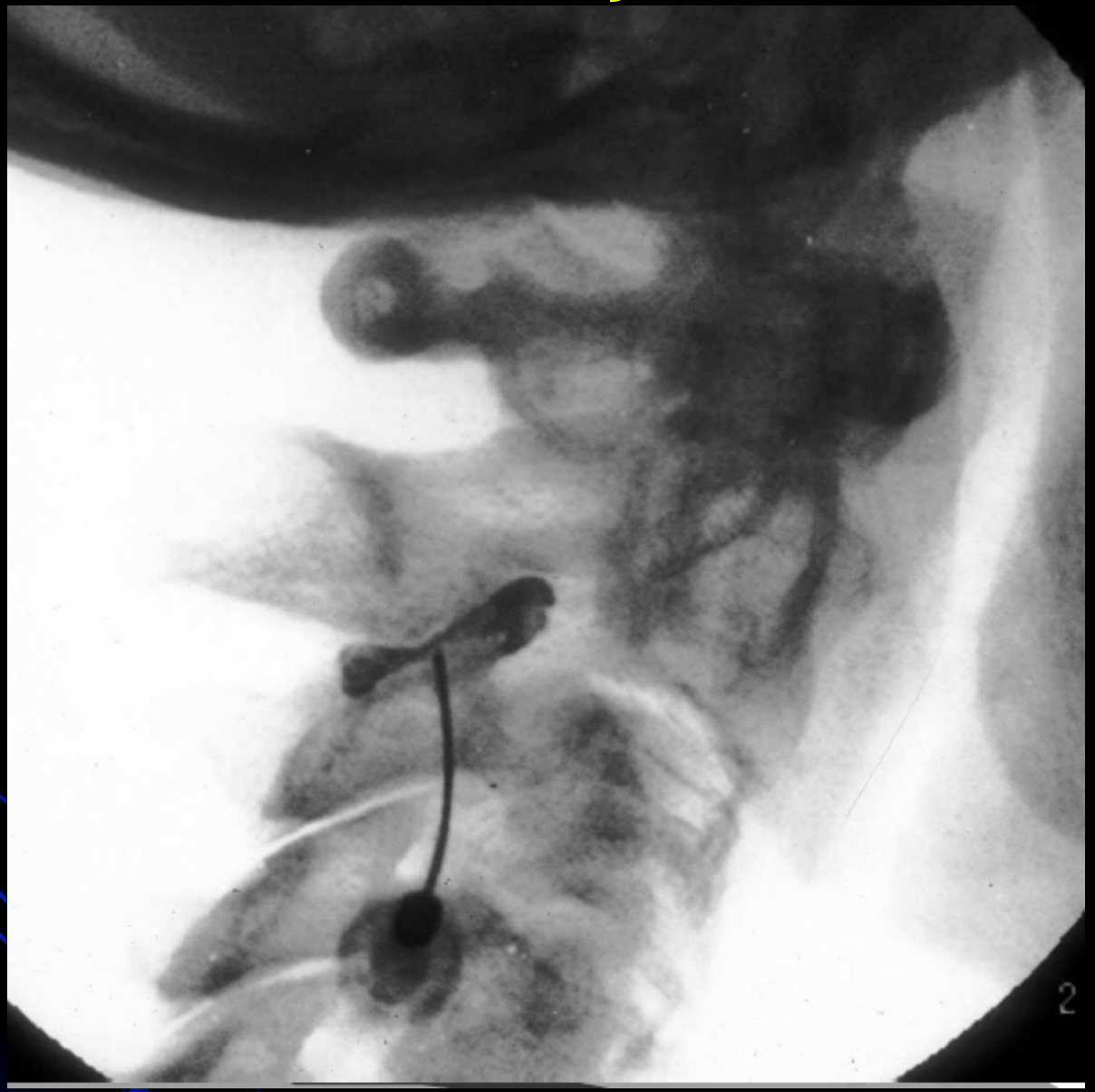
Cervical epidural steroid injection at the C7-T1 interlaminar space



Cervical transforaminal nerve root injection

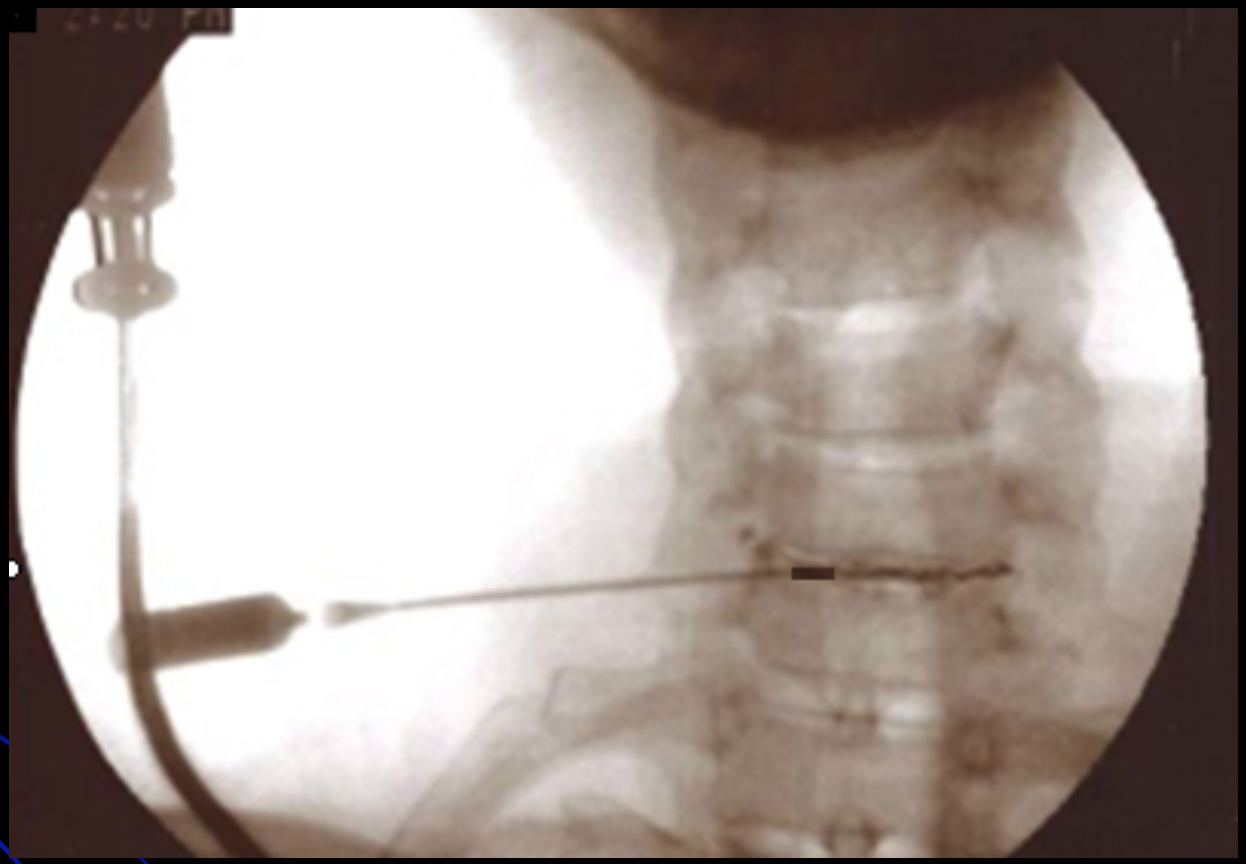


Cervical Facet Injection C2-3



Block of the Medial Branch of Cervical Dorsal Ramus

Cervical Nucleoplasty



Cervical Steroid Injection

- The clinical use of cervical epidural and nerve root injections is based largely on these theoretical and other anecdotal considerations.
- Well designed, placebo controlled studies are lacking.

Selective nerve root blocks

The perineural space surrounding selected root(s) is injected.

Advantages over epidural injection include:

(1) specific targeting of problematic root(s) and the dorsal root ganglion, resulting
(2) greater local concentration of steroid at the desired location
(2) diagnostic information obtained by blocking the pain associated with a symptomatic root
(3) avoidance of the spinal canal and, thus, of potential complications associated with entry into the epidural space
(4) a smaller volume of injectate versus the interlaminar epidural approach
(5) targeting the area anterior to the nerve root, where most compressive cervical lesions arise.

- Long-term success in 40% to 70% of patients who received translaminar or transforaminal epidural corticosteroid injections for treatment of cervical radiculopathy.
- Rare but potentially catastrophic complications can be associated with these injection techniques.

Bush K, Hillier S. Outcome of cervical radiculopathy treated with periradicular /epidural corticosteroid injections: a prospective study with independent clinical review. Eur Spine J. 1996;5:319-25.
Cicala et al. Long-term results of cervical epidural steroid injections. Clin J Pain. 1989;5:143-5.
Vallee et al. Chronic cervical radiculopathy:
lateral-approach periradicular corticosteroid injection. Radiology. 2001;218:886-92.

Complications of cervical injections

these complications are rare

- dural puncture
- meningitis
- epidural abscess
- intraocular hemorrhage
- adrenocortical suppression
- epidural hematoma
- root or spinal cord injury

Cervical transforaminal steroid injections

- 2 case reports with intrinsic spinal cord damage
  high incidence of entering the intravascular space
  fatal case of spinal cord infarction
- radicular artery can be infiltrated by a transforaminal epidural steroid injection.
- the potentially catastrophic complications that can follow a cervical transforaminal epidural steroid injection cannot be underestimated.

Surgical Treatment

- Most comparative studies of surgical versus nonsurgical management suffer from lack of randomization and selection bias.
- Patients with more severe symptoms are treated surgically.
- Lack of control groups.

- The available small randomized trials do not provide reliable evidence on the effects of surgery for cervical spondylotic radiculopathy or myelopathy.
- It is not clear whether the short-term risks of surgery are offset by any long-term benefits.

For nonvalidated reasons, cervical disc extrusions are frequently considered a definite indication for surgery.

Indication for Surgical Treatment

- Radicular pain for >6 weeks.

- Severe or progressive clinical myelopathy with concordant radiographic evidence of spinal stenosis.

Indication for Surgical Treatment

- Patients with neuroradiologic evidence of spinal cord compression but *no symptoms or signs of myelopathy* should generally be observed.

- For patients with *clinically evident but nonprogressive disease*, there are no clearly established guidelines with regard to the indications for operative treatment.

Surgical Options

- Anterior Cervical Discectomy
- Anterior Cervical Discectomy with Fusion
- Artificial Disc Replacement
- Corpectomy
- Foraminotomy
- Minimal Access Discectomy

The best type of surgical procedure for cervical radiculomyelopathy is not known.

Surgical procedures for cervical radiculomyelopathy

- Death rates 0% to 1.8%.
- Nonfatal complications in 1% to 8% of patients.
- The therapeutic effects of surgery are not always satisfactory.
- The overall outcome may be similar to that for conservative management.

2 RCT trials were found from the screening of 13,209 citations.

No conclusive evidence was found to support surgical treatment for cervical spondylotic radiculomyelopathy.

Fouyas et al. Cochrane Review on the Role of Surgery in Cervical Spondylotic Radiculomyelopathy. Spine 2002

A single prospective randomized controlled trial was found that compared surgical and conservative treatment for cervical radiculopathy.

Persson et al. Long-lasting cervical radicular pain managed with surgery, physiotherapy, or a cervical collar. Spine 1997; 22:751–8.

- 81 patients were randomly allocated to surgery, physiotherapy, or hard collar immobilization.
- At 3 months, surgery had resulted in superior results in terms of pain (29% reduction in VAS), as compared with physiotherapy (19%) or hard collar immobilization (4%).
- At 1 year there were no significant differences.

Persson et al. Long-lasting cervical radicular pain managed with surgery, physiotherapy, or a cervical collar. Spine 1997; 22:751–8.

Outcome in Patients With Cervical Radiculopathy: Prospective, Multicenter Study With Independent Clinical Review
Sampath et al. Spine, 1999

- Cervical Spine Research Society
- 503 patients, by 41 CSRS surgeons
- 46 (49%) had radiculopathy
- mean duration of symptoms 26.7 months
- mean age 48.1 ± 12.42 years
- 51 (33%) underwent surgery, and 104 (67%) received medical treatment
- 1 year follow-up

Outcome in Patients With Cervical Radiculopathy: Prospective, Multicenter Study With Independent Clinical Review
Sampath et al. Spine, 1999

- Patients not randomized; no direct comparison possible.

- Surgically treated patients had a significant improvement in pain, neurologic symptoms, functional status, and ability to perform ADL.

- Patients treated medically also had significant improvement in pain and overall functional status.

- A significant number of patients who underwent surgery reported persistent excruciating or horrible pain on follow-up (26%).

Type 2 error?

A larger number of patients may be needed to provide more reliable evidence on the long-term effects of surgery.

The value of somatosensory- and motor-evoked potentials in predicting and monitoring the effect of therapy in spondylotic cervical myelopathy: Prospective randomized study. Bednarik et al. Spine 1999; 24:1593-8.

- 49 patients with mild or moderate myelopathy
  surgery or conservative treatment.

- mJOA and gait scores:
  better among conservatively treated patients at 6 months.

- at 2 years, no differences were noted between
  the two groups in terms of functional disability.

Cervical spondylotic myelopathy: Conservative vs Surgical Treatment. Kadanka et al. Spine. 2002 Oct 15;27(20):2205-10

- 68 patients with mild to moderate symptoms
- Prospective Randomized
- conservative vs surgical treatment
- Anterior or posterior cervical decompression
- 3 yrs f-up
- No significant differences in functional or quality of life indicators, even three years after treatment.
- significant difference in the timed 10-m walk test favouring cons group

Better response to conservative treatment by patients with mild myelopathy

- greater AP diameter of the spinal canal
- transverse area of the spinal cord of >70 mm^2
- age >65 years

Cervical Radiculopathy

- Treatment is conservative
- In selected cases surgical treatment
- Careful patient selection