

# CERVICAL MYELOPATHY

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Recognition and management

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# Cervical Myelopathy-Definition

- A clinical syndrome
- Dysfunction of the spinal cord
- Intrinsic and Extrinsic causes
- Cervical spondylotic myelopathy (CSM): most common cause of spinal cord compromise

# Anatomic and pathological changes that may occur in DCM

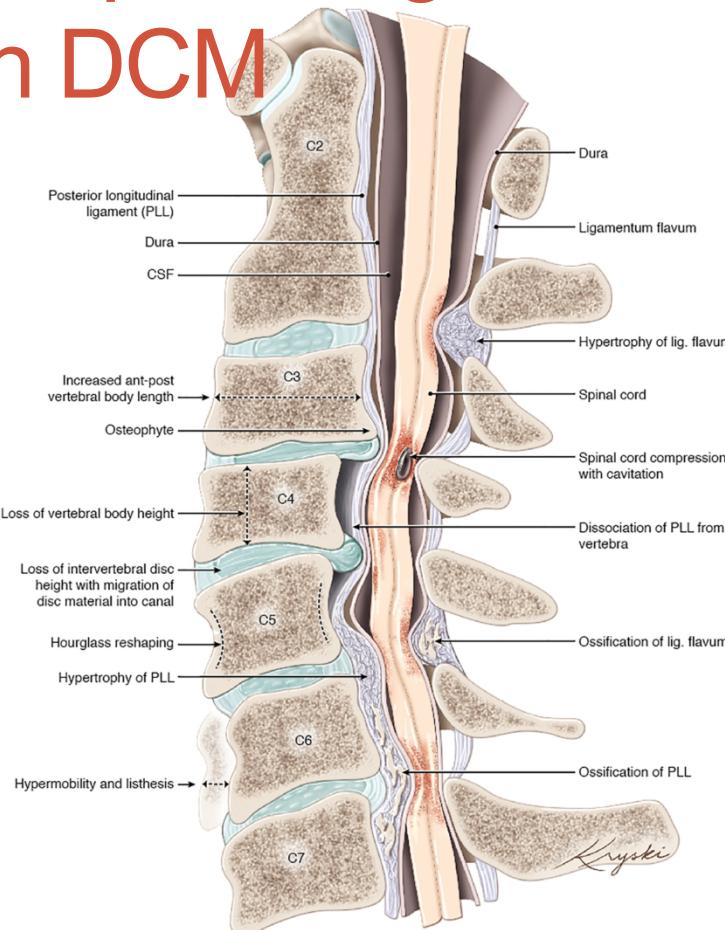
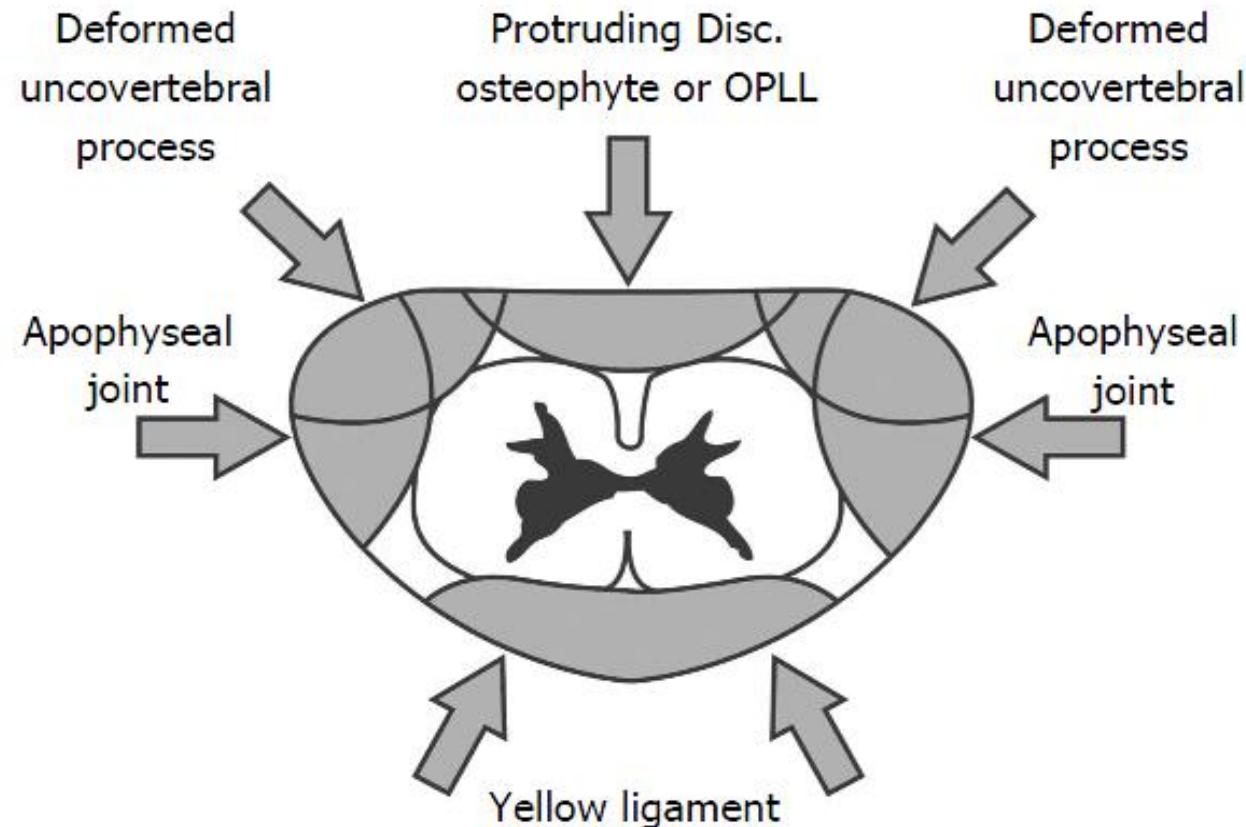


Figure 1: From: State of the Art in Degenerative Cervical Myelopathy: An Update on Current Clinical Evidence  
Neurosurgery. 2017;80(3S):S33-S45. doi:10.1093/neuros/nyw083  
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## Degenerative changes that contribute to extrinsic compression of the spinal cord in cervical myelopathy



# Pathophysiology of extrinsic spinal cord compression

- **Degenerative - cervical spondylosis**
- Congenital stenosis
- OPLL (ossification of the posterior longitudinal ligament)
- Tumour
- Epidural abscess
- Trauma
- Cervical kyphosis
- Rheumatoid arthritis , destructive spondyloarthropathy

# Differential Diagnosis-some conditions to consider

- Normal aging
- Multiple Sclerosis
- Motor neurone disease
- Polyneuritis/polyneuropathy eg Landry-Guillain-Barre, diabetic , vit B12 def. (100 types)
- Brachial neuritis
- Syringomyelia

(Be aware not a complete list)

# Presentation

Variety of symptoms of insidious onset-usually in 50-60 year olds.

- **Gait imbalance (worse in the dark)**
- Neck: axial neck pain, occipital headache, stiffness esp extension
- Pain in arms/shoulders
- Distal weakness
- Clumsiness of hands
- Paraesthesia/dysesthesia one or both upper limbs(non dermatomal)
- Lhermitte sign
- Urinary retention-rare (late stage)

# Examination 1

## Observation/reporting

- **Changes to gait pattern**
- Atrophy of small muscles of hands
- Difficulty manipulating fine objects
- Toe to heel walk poor
- Rombergs test +ve
- Functional scores eg European myelopathy score (EMS)

# **Examination-2**

Neurological examination of upper and lower limbs  
(essential)

## **Motor**

- Weakness-difficult to detect
- Finger escape sign
- Grip and release test

## **Sensory**

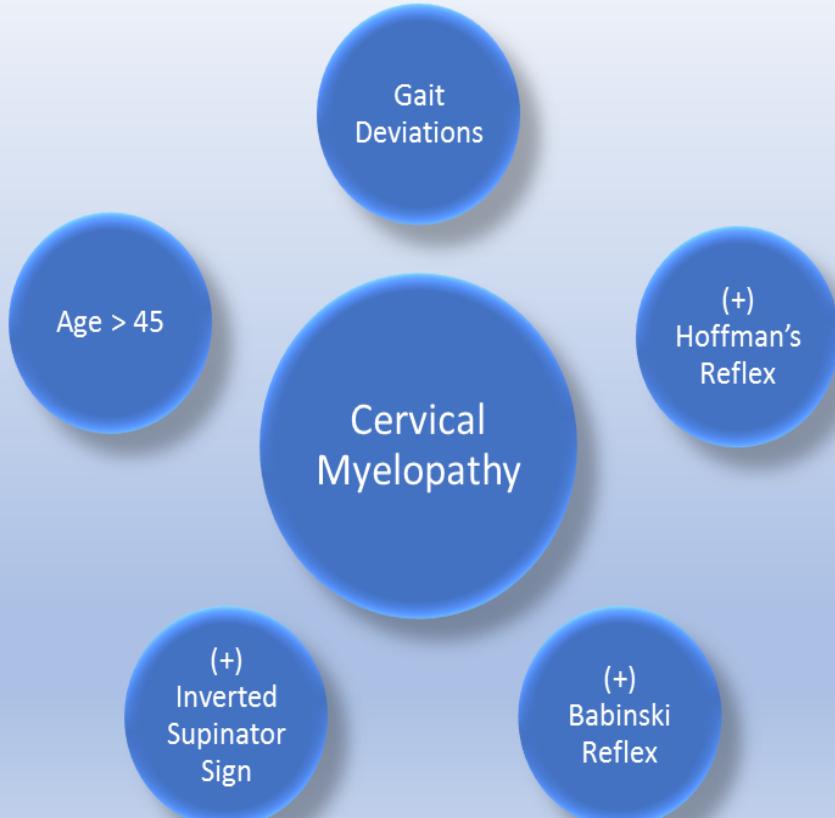
- Proprioceptive dysfunction
- Decreased sensation

# **Examination-3**

## **Upper motor neurone tests**

- Increased muscle tendon reflexes
- Inverted radial reflex
- Hoffmann's sign
- Positive Babinski sign
- Sustained clonus
- Decreased vibratory sense in lower extremities- advanced

# Diagnostic Clinical Cluster for Cervical Myelopathy



- Combinations of 3/5 or 4/5 tests enabled adjustments of post-test probability of the condition to 94–99%
- Radiographic spinal canal narrowing is often asymptomatic which underscores the importance of a thorough history and physical examination in making the diagnosis of CSM.
- CSM can frequently be managed with conservative care.
- Those with progressive symptoms, bowel or bladder dysfunction, or overt weakness should be considered for operative intervention.

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2. Lebl DR, Hughes A, Cammisa FP, O'Leary PF. Cervical spondylosis myelopathy: pathophysiology, clinical presentation, and treatment. *HSS J*. 2011;7(2):170-8.

# Investigations

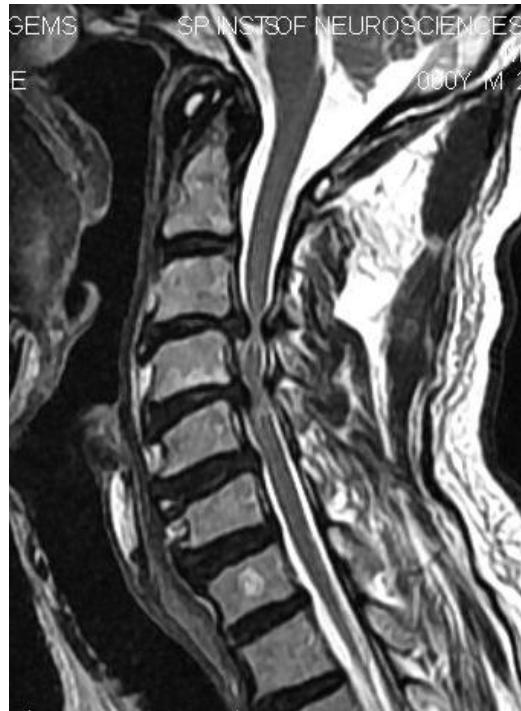
- **MRI-study of choice;** soft tissue resolution and multi-planar ability.

May be useful

- Neurophysiology
- X-rays: (erect AP and lateral) assess kyphosis or scoliosis, flex/ext views assess listhesis.
- CT- boney changes eg OPLL, adjacent level degeneration, autofusion at the level, trauma

# MRI

Severe canal stenosis at C3-4 and C4-5, significant cord compression with changes of myelomalacia



# Treatment

- Individually tailored management-no guidelines
- **Non-surgical:**
  - Medications-pain, neuropathic presentation.
  - Physiotherapy-neck strengthening, balance and gait training
  - Spinal Injection-for lower motor neurone symptoms
  - Immobilisation-hard collar in slight flexion ? in presence of instability
  - Observe for progression (warn re central cord syndrome)
- **Surgical:**
  - Decompression with or without fusion of the spinal column

# Case-1

A 56-year-old woman presents with neck pain which has been worsened over last few years. On examination she has full power in upper and lower limbs bilaterally. She has a normal gait and no difficulties with manual dexterity. Reflex testing shows hyperreflexia in both Achilles tendons. A lateral X-ray shows loss of cervical lordosis and mild degenerative changes at C5-6, C6-7. Sagittal MRI shows mild stenosis and loss of cervical lordosis. The axial MRI indicates left-sided foramina stenosis at C5-6. What is the most appropriate management?

- A. Refer for surgical opinion
- B. Refer for physiotherapy
- C. Wait and see/monitor approach
- D. Order further imaging

# Case-1

- Answer B. The patient's clinical picture is consistent with cervical spondylosis. Minimal symptoms without hard evidence of gait disturbance or pathologic reflexes warrant non-operative treatment, making physiotherapy the correct answer.
- Patients can benefit from advice on managing their condition
- Patients with neuroradiologic evidence of spinal cord compression but no signs of myelopathy should be managed non-operatively.
- Abnormal scans are common in asymptomatic patients
- Operative interventions for patients with mild to moderate spondylotic cervical myelopathy not shown to be superior to conservative management at 3 year follow-up

## Case-2

A 67-year-old woman has low back pain and bilateral buttock and leg pain. She prefers to stoop over the shopping trolley when shopping. She has noticed difficulty picking up small objects and buttoning her shirt. Physical exam shows normal strength in her lower extremities, and brisk bilateral patellar reflexes. She walks with a broad, unsteady gait. X-rays of the lumbar spine show retro Lis thesis of L5 and MRI significant spinal canal narrowing at L4/5. What is the most appropriate next step in management ?

- A. Refer surgical opinion for lumbar decompression
- B. Refer for physiotherapy.
- C. Request Lumbar epidural
- D. Cervicothoracic MRI

## Case-2

- Answer D.
- The patient is exhibiting signs and symptoms of lumbar spinal stenosis, which is confirmed by lumbar stenosis seen on her lumbar MRI. However, she also has clinical symptoms of cervical myelopathy. Therefore the next step in management is to obtain an MRI of the cervical spine.

Tandem stenosis occurs in lumbar and cervical spine in ~20% of patients

Treatment of cervical myelopathy takes precedence over lumbar treatment and can result in overall improvement

## Case-3

A 45-year-old man presents with difficulty walking and buttoning his shirt. It started two years ago but has worsened significantly over the last year. On physical exam he is unable to perform a heel-toe walking test and has a positive Hoffman's sign bilaterally, however he has no clonus and a down-going Babinski bilaterally. He has 4/5 strength in his hands, but 5/5 strength in all other muscle groups. MRI indicates cord compression at C4/5 and C5/6 and myelomalacia of the cord. What is the appropriate management?

- A. Observation
- B. Refer for spinal injection
- C. Refer or physiotherapy
- D. Refer for surgical opinion.
- E. Request lumbar MRI

## Case-3

Answer D:

The clinical picture is consistent with progressive cervical myelopathy, and the best treatment option is an anterior cervical discectomy and fusion.

Because there is compression at C4/5 and C5/6, an ACDF would need to be done at both levels.

# Prognosis

- Slowly progressive, rarely improves with non-operative modalities
- Progression characterised by step-like deterioration with periods of stable symptoms
- Early recognition and treatment, prior to spinal cord damage, is critical for good clinical outcomes
- Tandem stenosis in lumbar and cervical spine  
~20% of patients

# Key messages

- Clinical syndrome: signs and symptoms vary
- Clinical assessment vital-'top 5 signs and symptoms'
- Diagnosis requires confirmation with MRI
- Cervical spondylosis without myelopathic symptoms or myelomalacia on MRI can be managed conservatively
- Lumbar stenosis and cervical myelopathy frequently co-exist
- Myelopathy requires surgical opinion for monitoring or decompression

# References

- Dvorak et al (2003) Cervical Neuropathy: clinical and neurophysiological evaluation. *Eur Spine J*; 12(Suppl 2) 181-187.
- Figure 1: Artist depiction of anatomic and pathological changes that may occur in the setting of DCM. Reused with permission from Nouri A, Tetreault L, Singh A, Karadimas SK, Fehlings MG. Degenerative cervical myelopathy: epidemiology, genetics, and pathogenesis. *Spine*.
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