DR. RAVI SHANKAR

BRAIN & SPINE SURGERY

Associate Director (Neurosurgery)

Institute of Neurosciences, Medanta

Medanta Hospital, Amar Shaheed Path, Lucknow, UP - 226030.

ravi.shankar@medanta.org, docravishankar@gmail.com

Website : http://neurosurgeonravishankar.com

Mob: +91 7042626566

NECK PAIN & CERVICAL SPONDYLOSIS

INTRODUCTION

- In entire lifetime 7 out of 10 people would be suffered by neck pain
- 1% of population of USA visit GP in a year for neck pain
- Most commonly caused by mechanical irritation
- At any one time, 12% females & 9% of adult males would suffer neck pain

ANATOMY OF CERVICAL SPINE

The most complicated articular system in the body which moves over 600 times in an hour!

Bears almost 8 pounds of weight of adult head & transmits it to dorsal spine

(Fortunately, due to buoyancy of brain floating in the CSF, its weight of nearly 3.1lbs is not added to it)

Its constituents are:

- Seven cervical vertebral bodies- form 88% of height of cervical spine
- Joints and intervertebral discs- make remaining 12% of height of cervical spine
- Ligaments • Fatty tissue • Venous plexus
- Neural tissue (cervical cord & cervical nerves)

Function : Protects spinal cord and nerve roots within the spinal canal

Even Giraffe, despite his hugely long neck has only 7 vertebrae.

Yet he is not known to suffer from cervical spondylosis (probably because he does not bend his neck)

Cervical Vertebrae

1) Atlas

First cervical vertebra (C1)

Has no body, as it fuses to body of C-2 during embryonic development to form dens

Acts as pedestal on which the skull rests, hence termed Atlas*

Participates in the unique structure of Craniovertebral junction (CVJ)

2) Axis

Second cervical vertebra (C2)

The largest body amongst all cervical vertebrae

Presence of dens is its unique identity and is, in fact, **the axis** (around which head and atlas rotate as a unit)

Contributes in formation of CVJ

Typical cervical vertebrae

Five in number, collectively known as Sub axial cervical spine Separated from each other by fibrocartilagenous intervertebral disc, the cartilagenous end plates lining both sides of vertebral body Height of each vertebra is greater posteriorly

Cervical vertebral body can sustain pressure of 1500N (N=Newton)

	Below 40yrs	Above 40yrs
Cortical bone	45%	65%
Cancellous bone	55%	35%

After 40 years cortical bone gets progressively cancellous (and fragile!), thus makes vertebral body prone for fracture

Intervertebral Discs

Totally five intervertebral discs in the cervical spine (from C2 to C7)

Relatively larger in size than their thoracic counterpart

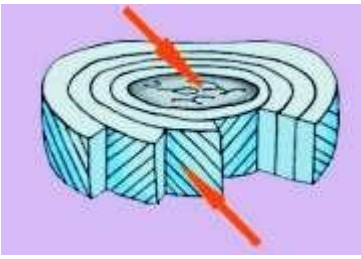
Elastic in youth, but loses elasticity as age advances

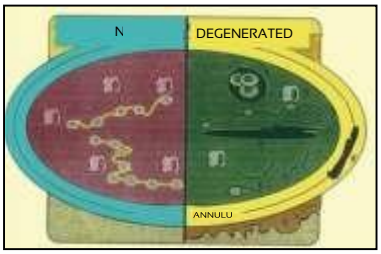
Height of the disc(unlike the body) is greater anteriorly, thus maintaining cervical lordosis

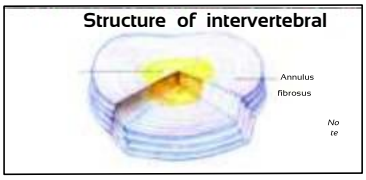
Consists of central, soft, jelly-like nucleus pulposus, surrounded by thick annulus fibrosus

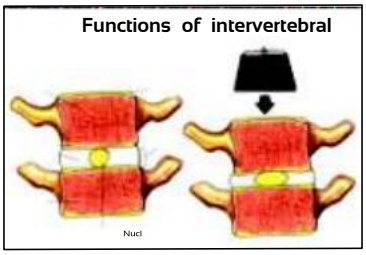
Water content is as high as 88% at infancy, but drops to 70% in 7th decade

Dessication of disc, however, starts in the 3rd /4th decade, and with that commences the problem of spondylosis









Molecular Structure of Disc

Nucleus Pulposus (N P)

Occupies slightly less than 50% of cross section of disc

Consists of loosely arranged type II collagen fibres, mucoproteins and polysaccharides

Glucosaminoglycans (GAG) are structural units of N P

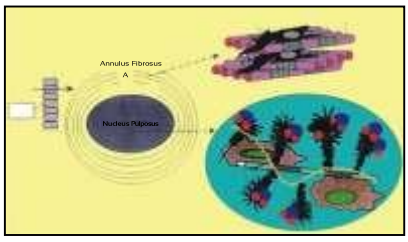
Central core is formed by hyaluronic acid to which are attached protein cores, which ultimately bond to chondroitin sulphate & keratan sulphate

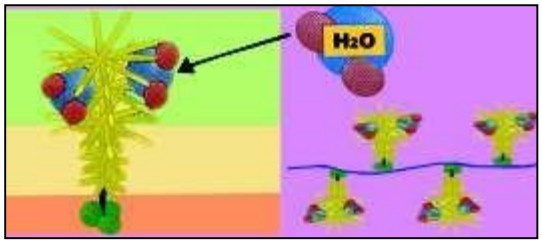
Chondroitin sulphate is highly negatively charged hence holds water which is rich in hydrogen ions

As age advances amount of chondroitin reduces and makes the disc

dessicated Disc richer in water during morning hours hence more prone to

rupture at that time





Annulus Fibrosus

Outer fibrous portion constituted by 90 lamellae of Type I collagen fibres

Successive lamellae run perpendicular to each other

Outermost lamella adheres directly into vertebral body via Sharpey's fibres (to which the fibres of ligaments and muscles get directly attached)

Inner lamellae insert on cartilaginous plate

Functions of the disc

Acts as shock absorber during walking and running • Acts as ball bearing

Muscles

Para cervical muscles

Anterior /strap muscles

Functions :	**Functions :**
Extension of neck	Flexion and lateral rotation & lateral flexion
Maintain upright posture of head	Supports cervical spine while lifting heavy weight

Uncovertebral Joints

Also known as **'Joints of Luschka'** • synovial joints situated on both sides of cervical intervertebral disc • Osteophytes arising contributes in cervical spondylosis

Ligaments

These elastic tissues have dual function of allowing movement in physiological limits while resisting motion beyond it

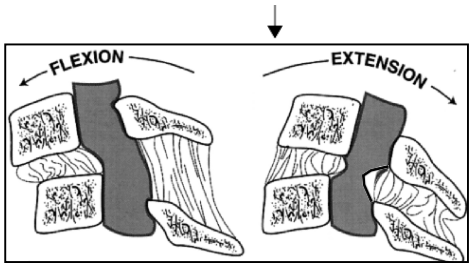
These are : Anterior longitudinal lig. (ALL), Posterior longitudinal lig. (PLL), Ligamentum flavum, cruciate lig., & Capsular ligs. of all facet joints

Ligamentum flavum (Yellow ligament) decreases in length by 10% in extension while stretches by 35% in full flexion

This can hypertrophy and cause significant cord compression during hyperextension in the elderly, or following acute hyperextension injury

Anterior view

Posterior view



Hypertrophied Ligamentum flavum

Cervical Spinal Cord

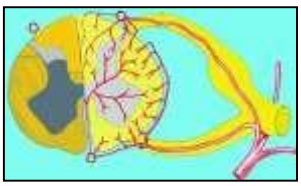
Cervical segment is thickest portion of the entire spinal cord

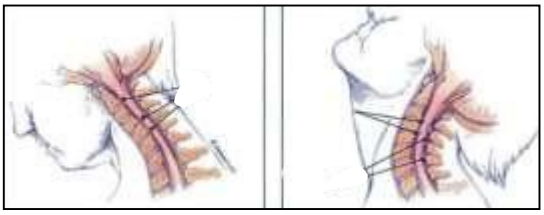
Cervical cord extends from upper level of C-1 nerve root attachment to upper level of D-1 nerve root attachment

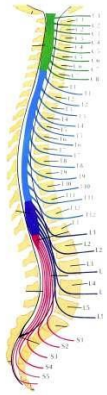
Cervical 'enlargement' extends from C-3 to D-2 (corresponds to origin of brachial plexus)

Blood supply by Anterior spinal / R &L Posterior spinal / deep cervical arteries

Conducts sensations from the periphery towards the brain, and motor signals towards the body







Cord can lengthen by 10% during flexion with compensatory reduction in its cross sectional area. Conversely, it shortens & expands in width during extension

Vertebral Artery,... " THE ARTERY OF LIFE"

One on each side

Arises from second part of Subclavian artery in neck and is divided into four parts:

Part I - From origin to foramina transversorium of C6 vertebra

Part II - Within the foramina transversoria of all cervical vertebrae, except C7

Part III - Lies around atlas vertebra

Part IV - Intracranial

Both vertebral arteries join to form the Basilar artery and

together supply brainstem, cerebellum, occipital lobe of cerebrum,

and through posterior cerebral arteries communicates with Circle of

Willis

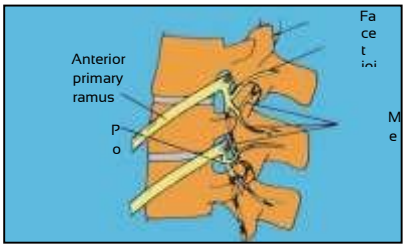
Prone to traumatic dissection at its bends around atlas (at junction of 3rd & 4th parts). Responsible for cervicogenic headache

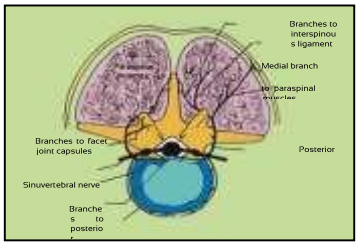
NERVE ROOTS

Formed by assimilation of dorsal (sensory) & ventral (motor root) rootlets

Each spinal nerve thus formed gives rise to sinuvertebral nerve near ramus communicans which innervates PLL, epidural vasculature, dura and spinal periosteum

Posterior rami supplies facet joints, paracervical muscles & dorsal nuchal skin
Anterior rami forms cervical & brachial plexus





PAIN SENSITIVE STRUCTURES IN THE NECK

Para cervical muscles

Ligaments: ALL, PLL, Cruciate and Capsular ligaments

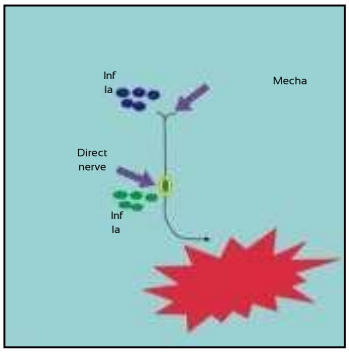
Bones – Vertebral bodies

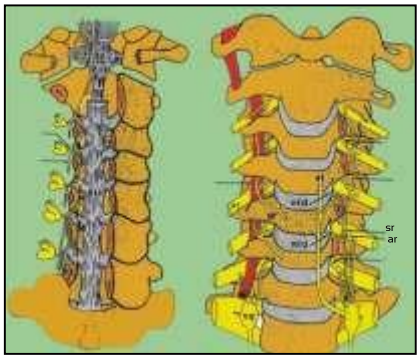
– Facet joints

Intervertebral discs

Nerve roots Spinal Dura

Vertebral arteries





Elicitation of the cause and site of pain is complex and not as easy as it seems and requires careful history taking and examination

BIOMECHANICS OF CERVICAL SPINE

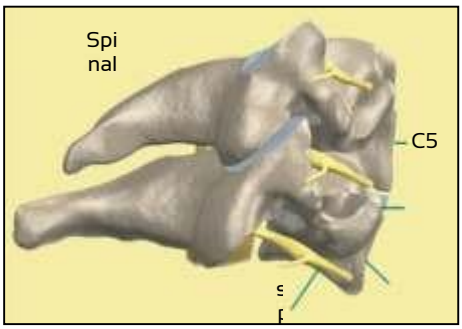
Basic function of cervical spine is transmission of load by head. It permits sufficient movement of members to allow physiologic movement, whilst resisting the abnormal one

What is motion segment in spine?

It consists of two adjacent vertebrae and interconnecting ligaments, discs and capsules

Degree of freedom

Implies number of unique independent motions that one vertebra can have with respect to another



Two types of degree of freedom:

1. **Translational -** forward / backward, up/down, side to side
2. **Rotational** - flexion/ extension, lateral flexion on both sides, and axial twist to right/ left

Regions	Divisions	Movements
Atlanto Occipital	C0 - C1	Most of the Lateral bending
Upper cervical	C1 – C2	Most of the axial rotation
Mid cervical	C2 – C5	Flexion is evenly distributed over whole cervical spine
Lower cervical	C5 - T1	

Coupling is property of spine to move by rotation or translation about one axis when subjected to a load about another axis

In upper cervical region, there is association between axial rotation and axial translation due to anatomy of lateral articulation, which is limited by facet joints

In lower cervical region, lateral bending to one side will result in rotation of spinous processes to **opposite** side

Spinal instability

It is loss of ability of the spine to maintain stable relationship between vertebrae in such a manner that there is neither damage nor subsequent irritation of the spinal cord or nerve roots under physiologic load

Classification of pain according to duration:

Acute : Less than 6 weeks duration

Sub acute: 6 weeks to 3months duration

Chronic : More than 3 months duration

TYPES OF NECK PAIN

1) Mechanical Neck Pain (Strain)

Commonest variety of neck pain, resulting from strain in paracervical muscles, ligaments or irritation of facet joints

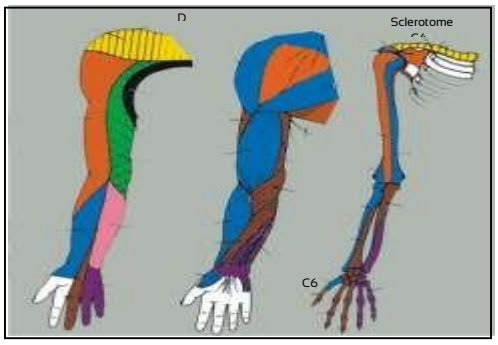
2) Radiculopathy

Located in the neck

→ Radiates → shoulder → arm → forearm → hand → fingers Usually confined to a specific dermatome

Affected by faulty posture, sneezing, coughing, straining, and lifting heavy weight

May be associated with sensory (tingling, numbness) / motor disturbance (weakness) in upper limbs



YOUNG PATIENTS →	POSTEROLATERAL DISC BULGE
MIDDLE AGED & ELDERLY →	UNCOVERTEBRAL OSTEOPHYTE

2) **Myelopathy** *(**myelo=** spinal cord, **pathy=** disease)*

Presents as Spasticity , Weakness, Gait disturbance

Lhermitte's sign: Generalized electric shock-like sensation occuring with neck movements (extension / flexion)

Autonomic disturbances : vertigo, flushing, tinnitus, visual blurring, fall of blood pressure, sweating, increased intestinal motility

Bladder / bowel disturbance

4) Myeloradiculopathy

Combination of 2 & 3

5) Dizziness

Often attributed to cervical spondylosis, but wrongly so!

(Vertebral arteries are very rarely compromised by lateral osteophytes)

Is Dizziness / Giddiness scientifically attributed to cervical

spondylosis?

Fact or Fiction??? "Due to disturbed proprioception of Facet Joints"

CLASSIFICATION OF CERVICAL SPINE DISORDERS

CONGENITAL

Spina bifida occulta

Defective fusion of midline during embryonic development, present since birth

Can be asymptomatic, but may manifest with stigmata in the form of tuft of hair, dermal sinus(es) over neck, gradually progressive weakness, limb deformities, bladder/ bowel involvement

Meningomyelocele

Rare entity, presenting as swelling over neck, with or without neurological deficit

Klippel Feil syndrome

Triad of fusion of two or multiple vertebral bodies, short neck, low hair line Three subtypes

Type 1:Fusion of whole cervical spine

Type 2:Fusion at single level

Type3:Associated with thoracolumbar or whole spine fusion

Type 2 is the commonest variety, may be associated with other systemic anomalies

Fracture

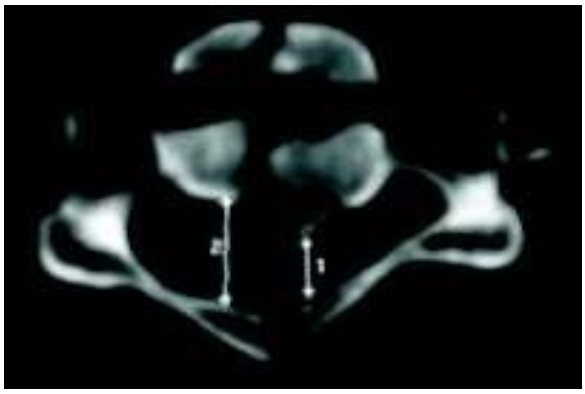
Can be with or without neurological deficit • Young population of 2nd / 3rd decade are more prevalent • Men suffer 4 times more than women • In the elderly, trivial trauma leads to fractures due to underlying osteoporotic changes, or metastasis

Mechanisms of injur

Flexion(Drunken man)

Hyper extension (Bath tub injury)

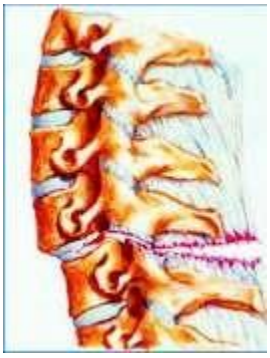
Compression(Diving injury)



Dislocation

Usually associated with fracture

Can be anterior listhesis /posterior listhesis



Disc prolapse

Trauma can force diseased and even a normal disc out!

INFECTIVE

Tuberculosis

Cervical : 15% • Dorsal : 50% • Lumbar : 35%

Afflict predominantly craniovertebral / cervicodorsal junction (areas of maximal mobility)

The terminology of '**spondylitis**' is to be carefully used to indicate only inflammation of the vertebral body in conditions such as Tuberculous, Rheumatoid or Ankylosing spondylitis.

It is totally different from cervical **'spondylosis'** which is a degenerative disorder

TB could be lurking around!

Do not ever underestimate TB, especially when there is continuous pain, torticollis or neck stiffness

Cervical lymphadenopathy?

Think of TB and actively rule it out!

Causes of myelopathy in TB

Direct: Compression by collapsed vertebra, Tubercular granulation tissue, Pus (cold abscess)

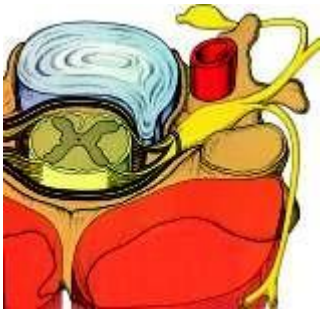
Indirect: Cord edema, vascular (tubercular endarteritis)

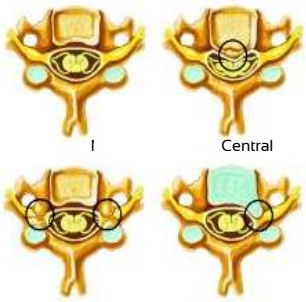
DEGENERATIVE

Acute disc prolapse

Can occur as degenerative process or even a normal disc in severe spine injury
Commonest site: C5-C6, Second commonest site: C6-C7

Type of Disc prolapse	Clinical presentation
Foraminal / Extreme lateral	Radiculopathy
Para central	Radiculopathy /Myelopathy
Central	Myelopathy





Cervical spondylosis

A non-specific, all-inclusive term describing the morphologic manifestations of progressive degeneration of the spine, clinically

presenting as :

- Neck pain & brachialgia (pain radiatiating into the arm)
- Neural compression syndrome (Motor / sensory)
- Occasional varied symptoms (mentioned earlier)

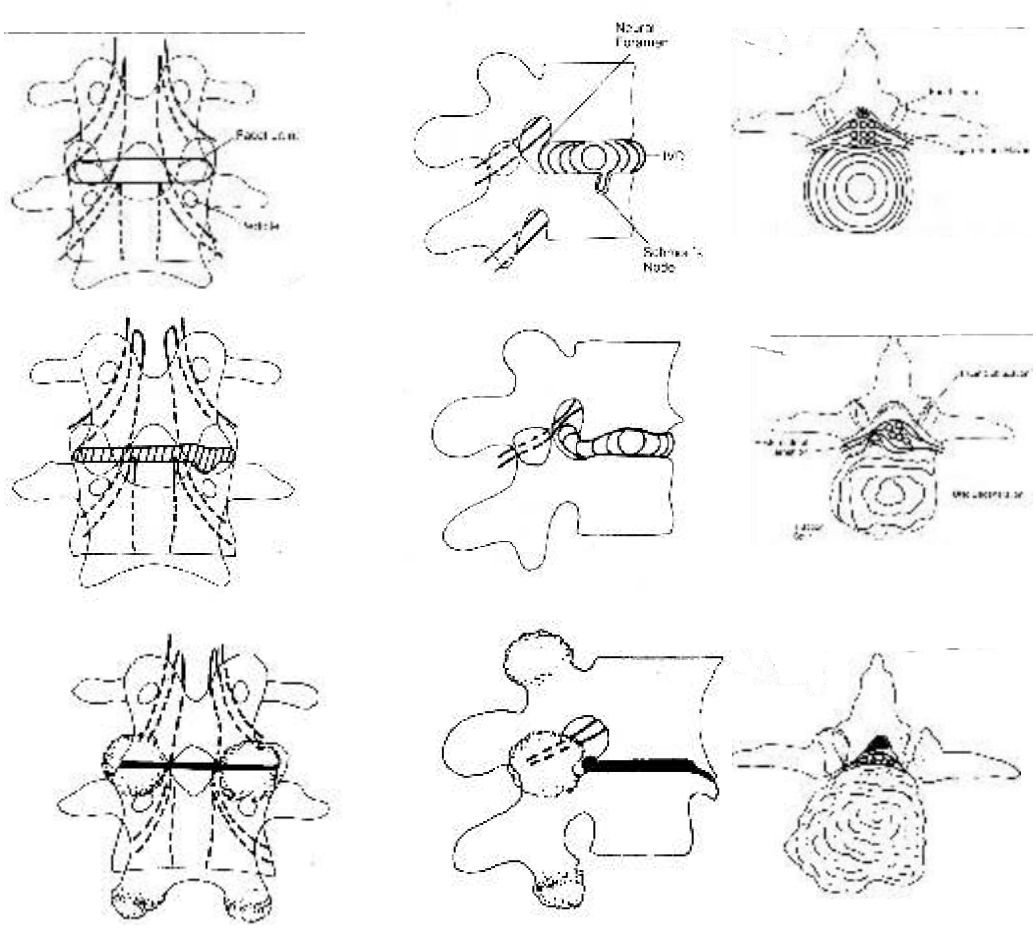
Predisposing factors:

Unduly long or short neck

Faulty postures:

Job related

Pathophysiology



Nurick's grades of cervical myelopathy

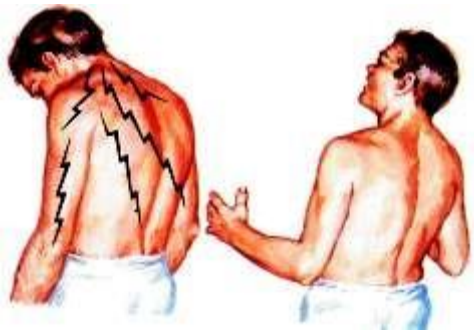
Grade : 0	**Root signs and symptoms, no evidence of cord involvement**
Grade : 1	**Signs of cord involvement, Normal gait**
Grade : 2	**Mild gait impairment, able to be employed**
Grade : 3	**Gait abnormality prevents employment**
Grade : 4	**Able to ambulate only with assistant**
Grade : 5	**Chairbound or bedridden**

Clinical presentation

Generally insidious onset, but can be acute & severe following trauma

Gait abnormality is often the first and commonest symptom

Clumsy hand syndrome (difficulty in buttoning, breaking bread, making hair) Constricting pain of trunk or abdomen



Causes of Myelopathy

Non compressive:

• ALS • Multiple sclerosis • Syringomyelia • Sub acute combined degeneration of spinal cord (SACD) • Transverse myelitis • Guillain – Barré Syndrome • Radiation myelitis • Toxic myelopathy (neuro lathyrism) • Adhesive arachnoiditis • Vascular: anterior spinal artery thrombosis

Compressive:

• Spondylotic • Canal stenosis • Fluorosis • OPLL • Spinal cord tumor

The cornerstone of successful management in myelopathy is accurately distinguishing between compression & non compression

Crandall & Batzdorf syndromes: 5 types

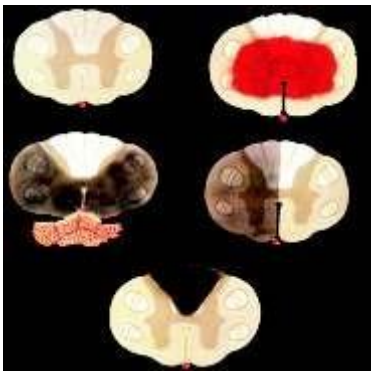
a) Transverse lesion syndrome
(CST+ STT+PC)

b) Motor syndrome (CST+/- AHC)

c) Central Cord syndrome

d) Brown – Sequard syndrome

e) Posterior column syndrome



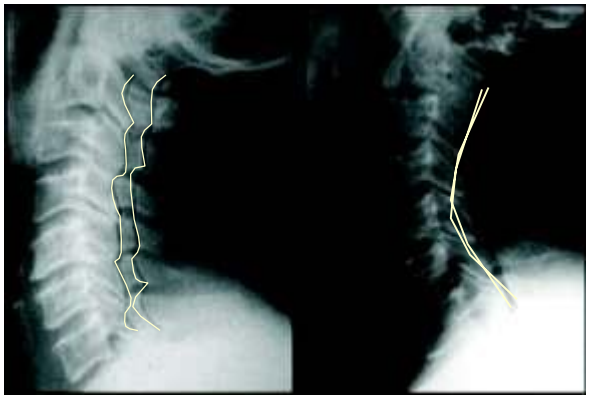
TUREL's Radiologic Sign for spinal canal stenosis

Separately identifiable 3 Lines on a plain lateral radiograph

1. Posterior vertebral line
2. Facet joint line
3. Spinolaminar line

Simple, plain radiologic sign for cervical spinal stenosis

In canal stenosis the spinolaminar line (3) overlaps or lies only marginally behind apophyseal joint line(2)



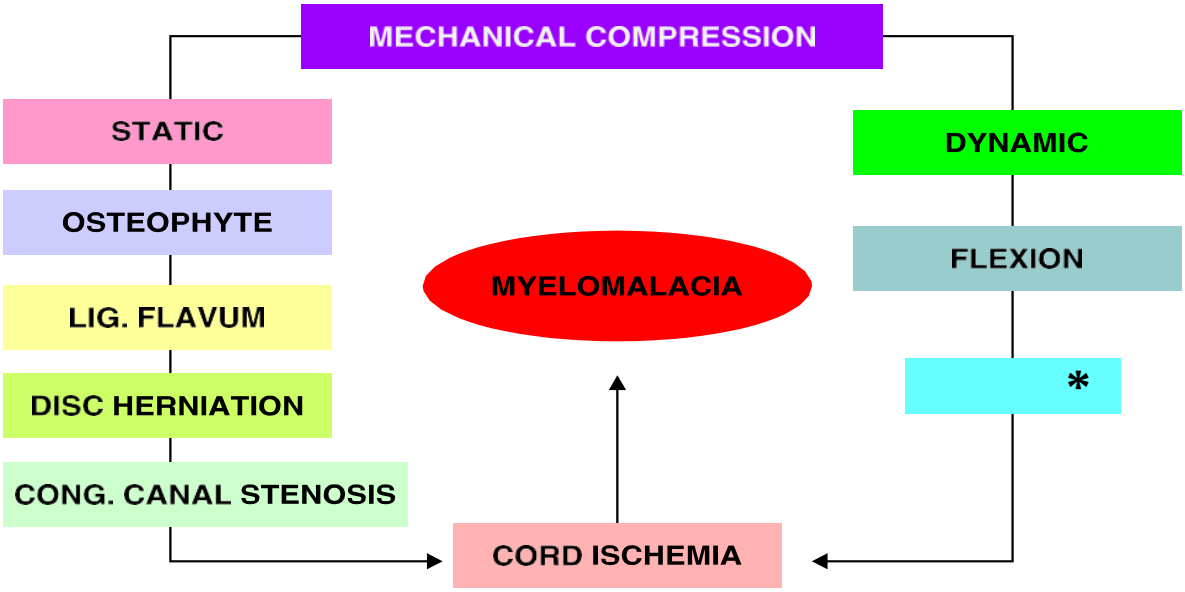
Myelomalacia

Definition

Loss of spinal cord bulk and substance from any kind of previous injury, damage or lesion

Usually seen as narrowing of spinal cord with characteristic signal changes on MRI

ETIOPATHOGENESIS



INCREASES INFOLDING OF LIGAMENTUM FLAVUM AGGRAVATES CORD COMPRESSION

METABOLIC

OPLL (Ossified Posterior Longitudinal Lig.), a complex pathology

Multifactorial viz. hereditary, hormonal, metabolic Types

Segmental lesions - discrete sites of ossification adjacent to vertebral body while discs are spared

Localized lesions- span a single disc but involve two adjacent vertebral

Continuous lesions- span two or more discs

Mixed- combines any two of preceding types

Pathogenesis

Hypervascular fibrosis

Hypertrophy of PLL

Cartilaginous proliferation

Lamellar bone formation

Haversian canal production

Progressive mineralization

(OPLL)

Osteoporosis

Causes reduction in strength of both cancellous as well as cortical bone 25% osteoporosis weakens the bone by 50%!

Osteopetrosis

Genetic heterogenous group of bone remodelling disorder

Increase bone density due to decreased osteoclastic bone resorption

Propensity to fracture is very high

NEOPLASTIC

Extradural tumors

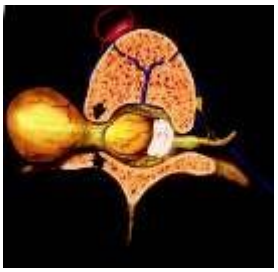
Forms 55% of spinal tumors

Well localized pain, weakness in all four limbs, imbalance while walking, delayed bladder and bowel involvement

Primary tumors: myeloma, neurofibroma, giant cell tumor, and eosinophilic granulomas

Secondary tumors: from prostate, breast or lung malignancies and lymphomas

Intradural extramedullary tumors



Forms 40% of spinal tumors

Localized Neck pain, weakness in all four limbs, late bladder/ bowel involvement

Common tumors: meningioma, neurofibroma, lipoma

Intramedullary tumors

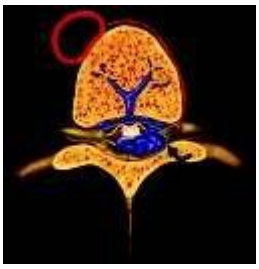
Constitutes 5% of spinal tumors Ill localized neckpain,

diffuse burning pain in limbs, & nocturnal pain

Bladder/ bowel disturbances, weakness in limbs

and dissociative anaesthesia

Commonly astrocytoma (30%), or ependymoma (30%)



Questions to be asked?

Spend time in listening to the patient!

Is there any neck pain?

Onset: How did the neck pain start?

"I must have slept badly!"

"No doctor, I never use a pillow"

or apologetically admits "yes I do, but it's a very thin pillow"

Duration: when did it start?

Progress: is it progressively better or worse?

Radiation: Does it radiate? Where? Shoulder, arm, chest, or interscapular region What aggravates it

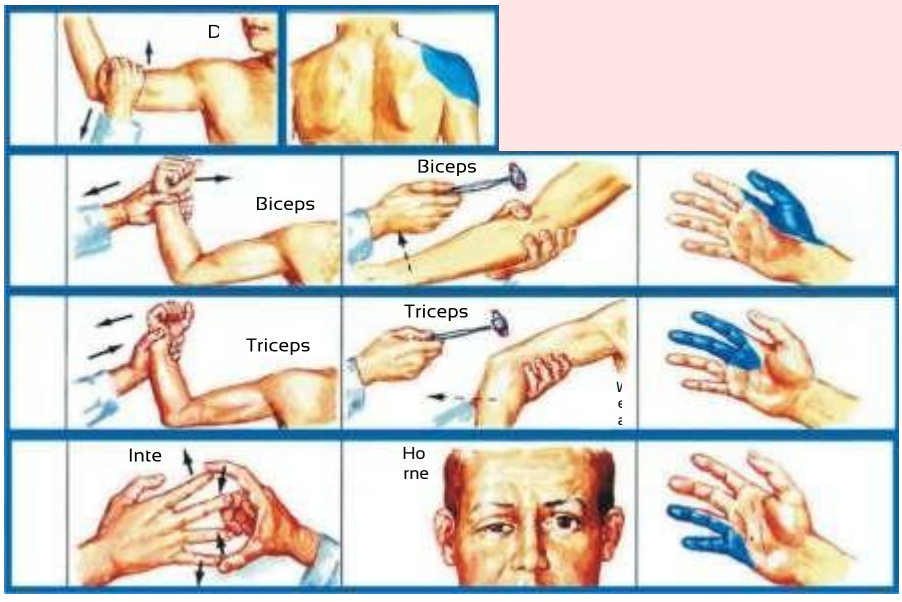
Is there any tingling sensation in the limbs?

Is there any limb weakness? Which segment? Is there any factor that relieves the symptoms? Have you received any form of treatment ?

Was it effective?

Was there any family member suffering from similar complaints

What the examining physician should see ?



DISC LEVEL	NERVE ROOT	PAIN DISTRIBUTION	SENSORY CHANGE	MOTOR DEFICIT	REFLEX CHANGE
C2-3	*C-3*	BACK OF NECK, MASTOID PROCESS, PINNA OF EAR	BACK OF NECK, MASTOID PROCESS, PINNA OF EAR	NONE DETECTABLE EXCEPT EMG	NONE
C3-4	*C-4*	BACK OF NECK, LEVATOR SCAPULAE, ANTERIOR CHEST	BACK OF NECK, LEVATOR SCAPULAE, ANTERIOR CHEST	NONE DETECTABLE EXCEPT EMG	NONE
C4-5	*C-5*	NECK, TIP OF SHOULDER, ANTERIOR ARM	DELTOID AREA	DELTOID, BICEPS	BICEPS
C5-6	*C-6*	NECK, SHOULDER, MEDIAL BORDER OF SCAPULA, LATERAL ARM, DORSAL FOREARM	THUMB AND INDEX FINGER	BICEPS	BICEPS
C6-7	*C-7*	NECK, SHOULDER,MEDIAL BORDER OF SCAPULA, LATERAL ARM, DORSAL FOREARM	MIDDLE FINGER	TRICEPS	TRICEPS
C7- D1	*C-8*	NECK, MEDIAL BORDER OF SCAPULA, MEDIAL ASPECT OF ARM & FOREARM	RING & LITTLE FINGERS	INTRINSIC MUSCLES OF HAND	NONE

Examine the whole spine with minimum clothing

- Curvature of neck : torticollis, scoliosis, lordosis, kyphosis, bamboo spine
- Mobility: flexion, extension, lateral bending
- Tenderness: midline spines, paracervical muscles
- Spasm: paracervical muscles, Trapezius
- Motor examination : muscle power, wasting
- Deep tendon reflexes, Hoffman's sign and Babinski reflex
- Sensory examination
- Rhomberg's Sign, Gait

Trapezius

Rhomboids

RELEVANT INVESTIGATIONS

X-rays of Cervical Spine

A basic mandatory investigation

Standard views: AP, lateral, obliques (Rt and Left) Special views: flexion/ extension, open mouth **Reveals:**

Curvature of cervical spine Reduction in disc space Spina bifida

Osteophytes Canal stenosis

Vertebral body / Pedicular destruction Compression fractures

Prevertebral soft tissue shadow

Disadvantages

Intraspinal soft tissue evaluation not possible Can miss early infective/ inflammatory pathology Myelogram

After Subarachnoid contrast injection

Reveals

Images in Sagittal plane

Functional obstruction in canal stenosis Disc bulge

Arachnoiditis Epidural fibrosis

Disadvantages

Needs admission

Extradural pathology may be missed

MRI

Has largely replaced myelogram / plain CT

When to do?

When diagnosis is in doubt Failure of

conservative treatment

When patient is likely candidate for surgery

Advantages

Sagittal imaging possible

Extra dural lesions also easily visualized

Ideal study for Intramedullary pathology (viz.tumor,syrinx, myelomalacia, hematomyelia)

Better modality for postoperative evaluation

Disadvantages

Prolonged study

noncompliance by Claustrophobic, improperly sedated

or ventilator supported patients Bony

study not satisfactory Difficulty in

scoliotic patients

CT scan plain

Efficacy may be equal to or even supersede MRI after subarachnoid contrast injection (CT myelo)

Visualises

Disc prolapse Loss of

epidural fat

Loss of normal convexity of dural tube

Excellent bony study

Fast scanning Less

expensive

Better canal evaluation

TREATMENT

ACUTE DISC PROLAPSE

Commonly known as soft disc prolapse

Conservative treatment

Majority of patients can be treated effectively

Bed rest

Bed rest eliminates the spinal load on ruptured disc, allowing to heal the annular tear by fibrosis.

It benefits if prolapse is not too large or not entrapping the nerve root in a stenotic canal or lateral recess.

First ever episode of disc prolapse often responds to bed rest (and other conservative measures), while subsequent episodes may not respond as favourably.

Medical treatment

Nonsteroidal anti-inflammatory drugs (NSAIDs)

Act as analgesic and anti-inflammatory agents • Useful in acute / chronic neck pain • Gastritis and nephropathy limits its prolonged use

Enzymes

Serratiopeptidase / chymotrypsinogen • Clinically found effective in reducing inflammation when supplemented to NSAIDs

Steroids

Anti-inflammatory action • Can improve neurological deficit when used in conjunction with other conservative/surgical measures • May produce gastritis, osteoporosis, aggravates diabetes

Gabapentin

Weak anti-convulsant agent • Effective in acute radicular pain • May cause dizziness, sedation

Neurovitamins

Vitamin B12, Folic acid, Thiamine, Lipoic acid

Neck support and immobilization

Different types of collars available viz . Soft collar, Firm collar & Hard collar • A week of firm collar application should take care of acute attack of neck pain • It helps by preventing movement and reduces inflammation around nerve root • Reminds patient about the disease and to take care of one's own neck • Traps heat locally and soothes skin to relieve pain

Soft

Changes in lifestyle

Stress management, weight loss, cessation of smoking, and ergonomic evaluation of working place

Postural training

Patients is expected to lie in any lateral position with pillow below head and another between two thighs

Traction

Stretching of spine with a hope to induce vertebral separation, in an attempt to reduce intradiscal pressure and in turn reduce compression on nerve elements

Administered in well equipped nursing home • Alternatively one can take it at home,

thrice a day, 15 mins. each time • Avoid extension during traction as it can aggravate neurodeficits

Can be taken sitting or lying down

Epidural steroid injection

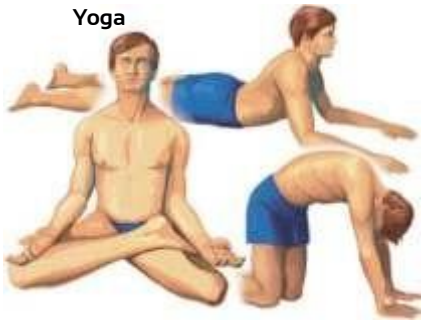
Useful in selected cases of facetal arthropathy

Injected around the facet under c-arm/ CT guidance

Physiotherapy

Start with daily isometric cervical exercises aimed at maintaining cervical lordosis and improving tone of cervical and paraspinal muscles

Yoga therapy



Other alternative therapies

SURGICAL TREATMENT

Aim: To relieve neurological symptoms (pain, paraesthesiae, weakness) whilst ensuring spinal stability

Indications

Radiculopathy

Myelopathy

Severe discogenic neck pain

neuro deficit

Anterior approach

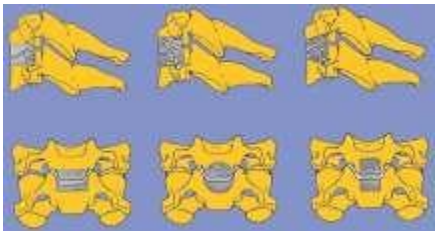
Anterior cervical microdiscectomy Classical anatomical operation Preserves cervical lordosis

Done with / without bony fusion

We prefer interbody graft placement

Promise of microsurgery

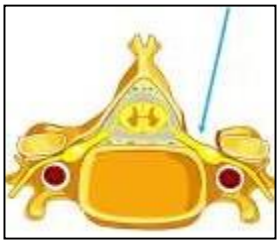
a) Instant, total and enduring pain relief
b) Neurological recovery is possible
c) Quick return to normal life
d) Highly safe procedure
e) Complication rate is less than 1%



Posterior Approach

Foraminotomy

Preferred for paracentral or foraminal disc prolapse eeds expertise in high speed drill and microsurgery

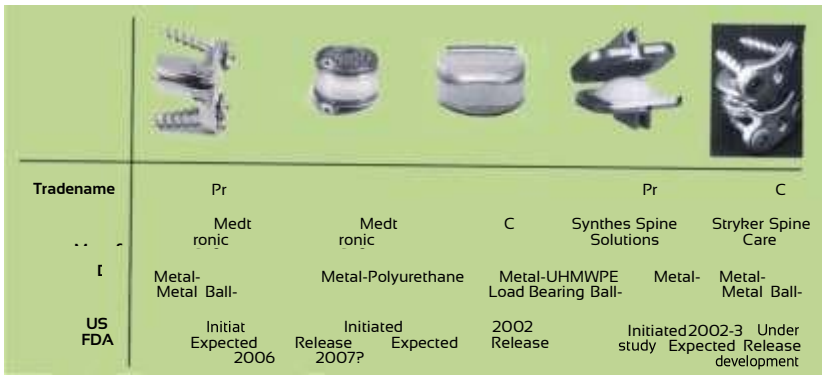


Recent advances Cervical disc replacement

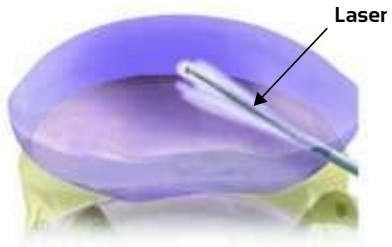
Aim :To preserve movement at motion segment which prevents juxtafusional disc

Different systems available

1) Bryan disc System
2) Prodisc –c
3) Prestige II
4) PCM
5) Cervicore



Laser discectomy



For minor annular disc bulge

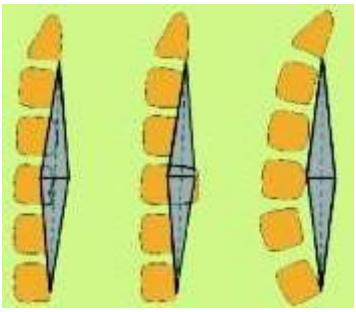
Is less effective than standard microsurgery Has yet to prove t

SPONDYLOTIC CANAL STENOSIS

Decision making Effective kyphosis

Configuration of cervical spine in which any aspect of the dorsal portion of the C3-7 vertebral bodies crosses a line drawn from the dorsocaudal aspect of C2 body drawn to dorsocaudal aspect of C7

Effective lordosis



Configuration of cervical spine in which no part of the dorsal aspect of the C3-7 vertebral bodies crosses a line drawn from the dorsocaudal aspect of C2 body drawn to dorsocaudal aspect of C7

Good lordosis permits posterior decompression without causing curvature changes

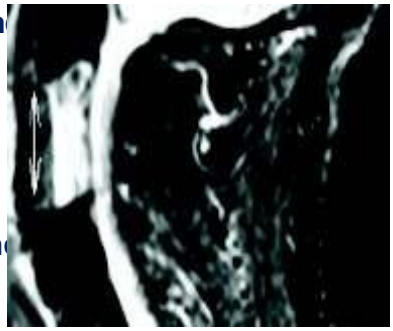
Conversely, presences of kyphosis contraindicates it and demands an operation by anterior approach to encourage normal lordosis

Anterior approaches

More anatomical and physiological operation, aimed at expanding the canal by removal of anteriorly placed offending agent (Disc, osteophyte, OPLL)

Prolonged procedure

1) **Anterior cervical microdiscectomy an osteophytectomy**

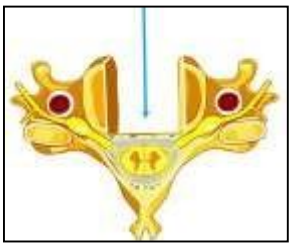


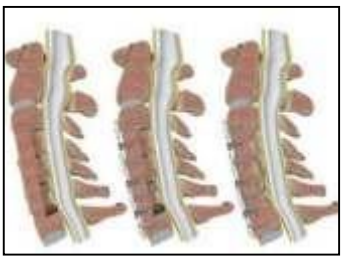
- Single level
- Multiple levels

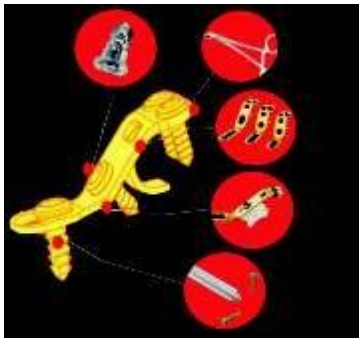
2) **Anterior cervical Corpectomy an osteophytectomy**

-without plating

Anterior cervical corpectomy & plating



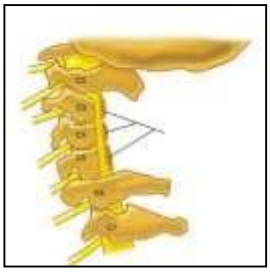


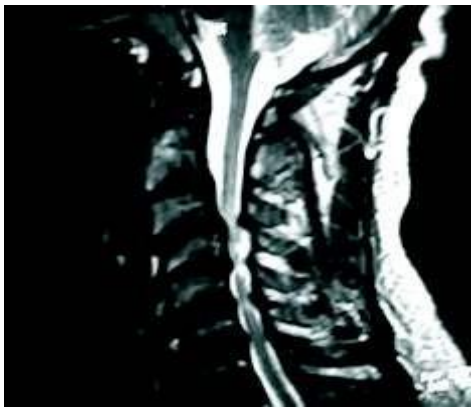


Posterior approaches

1) **Cervical Laminectomy**

Beware ! laminae are not disposable!



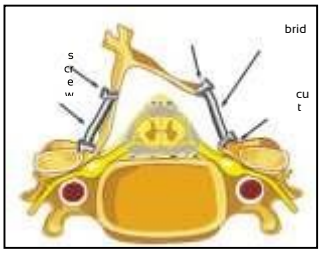


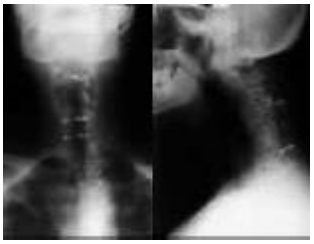
2. Cervical laminectomy and fusion

3) Cervical laminoplasty

Provides wide space for spinal cord expansion in a stenotic patient

Does not improve cervical lordosis, though it does prevent kyphosis

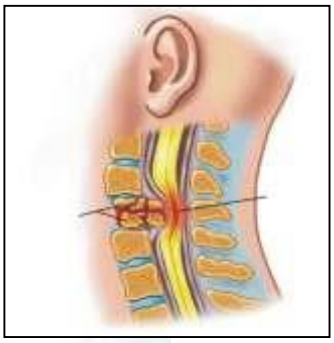




TRAUMATIC FRACTURE

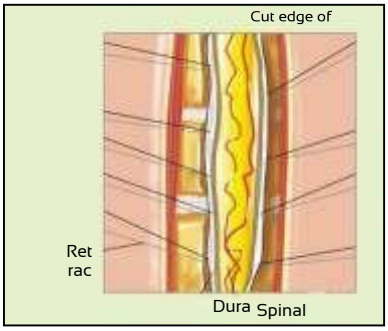
Can be treated conservatively in neurologically preserved patient,

But may need emergency surgery and decompression and fixation



CERVICAL TUMORS

Laminotomy, Excision, and Laminoplasty

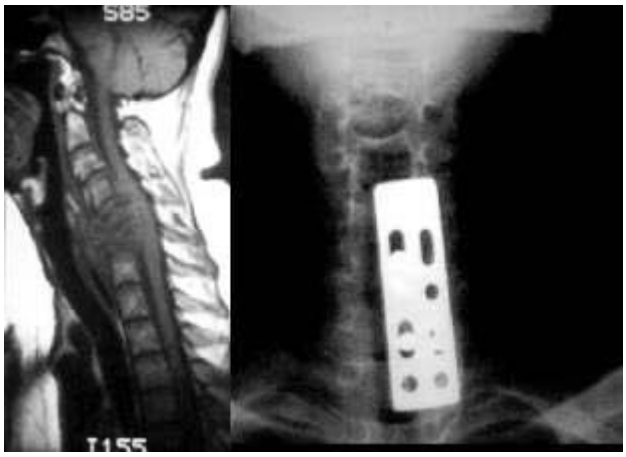


VASCULAR LESIONS

Needs intervention followed by open surgery

CERVICAL TUBERCULOSIS

Needs proper and full course of antituberculous chemothepary Few cases need fixation using plates & screws



COMPLICATIONS

- Oesophageal retraction injury
- Recurrent laryngeal nerve damage
- CSF leak
- Graft extrusion/instrument migration
- Neurological deterioration
- Iatrogenic infection

- **Recurrence ofsymptoms**

  usually due to incomplete disc/osteophyte excision

Juxtafusional discdegeneration

- ## CONCLUSION

- The commonest cause of neckpain is mechanical
- Majority of neckpains respond to conservative treatment
- Neurological deficit warrants surgical intervention
- Excellent operative results are possible but need expert hands

EXCERCISES FOR

CLOTHING

Outer Clothing should offer good protection against cold, wind and above all damp. A scarf keeps the neck (spine) warm and protects against all drought and cold.

PHYSICAL EXCERCISE

Regular exercise and walks promotes the circulation in the affected tissues and thus have an easing affect. Loosening-up exercises makes the spine more flexible and strengthens the respective muscles.

SITTING POSITIONS

Correct sitting position is important for the prevention and treatment of posture-related and wear - related damage. Chairs and Armchairs must provide good support to the spine. Seats and tables should be adjusted so that the spine retains it's natural upright posture. It is beneficial to use a reading desk with a sloping top when reading or writing.

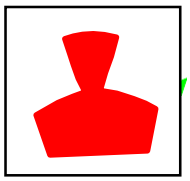
POSTURE

It is important to avoid forcing your body into a unnatural posture for too long as this can lead to discomfort of the muscle at the neck and shoulders. Regular physical exercise should above all be aimed at those regions of the body affected by symptoms and pain. It is best to carry out the exercise in the morning straight after getting up.

Below are a few physical exercises which should be carried out without strain and repeated several times. Discontinue the exercise if the pain should occur.

STARTING POSITION

Sit or stand in a relaxed position and carry out the following exercises with various positions of the head.



a. Hold your head upright.

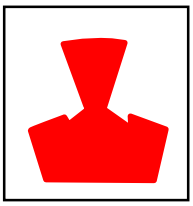
b. Bend your head forwards, drawing your chin down towards your chest.

c. Tilt your head right back.

a. Tilt your head alternately to the right and left.

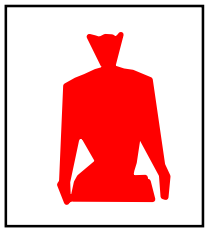
b. Turn your head alternately to the right and left.

c. Turn your head alternately to the right and left while resting your chin.



NECK PAIN

STARTING POSITION



Sit on a stool or a chair with your hands hanging loosely behind.

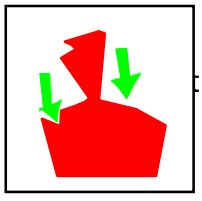
a. Let your shoulders drop forward. Press your shoulders back.

b. Raise your shoulders and let them drop again

c. Rotate your shoulders backwards and forwards, repeat the exercise several times.

STARTING POSITION

Sit or stand in a relaxed position.

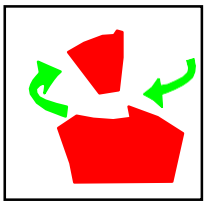


Press your chin down towards your chest, tilt your right back - t several times

Carry out the same exercise against a

resistance, .ie. hold your hand in front of your forehead and press your forehead against your hand for a few seconds, then fold your hands to the back of your head and press your head against your hands.

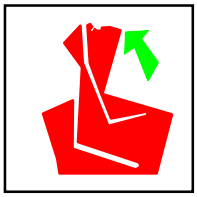
STARTING POSITION



Sit or stand in a relaxed position

a. Rotate your head to the left.

Rotate your head to the right. Repeat the exercise several times.



STARTING POSITION : Sit on a stool or a chair, with the hands at the back of your neck. Bend the upper part of your body to the left and let your left arm drop.

STARTING POSITION : Bend the upper part of your body to the right and let your arm drop.

DR. RAVI SHANKAR

BRAIN & SPINE SURGERY

Medanta Hospital, Amar Shaheed Path, Lucknow, UP - 226030.

ravi.shankar@medanta.org, docravishankar@gmail.com

Website : http://neurosurgeonravishankar.com

Mob: +91 7042626566