

Common spine disorders



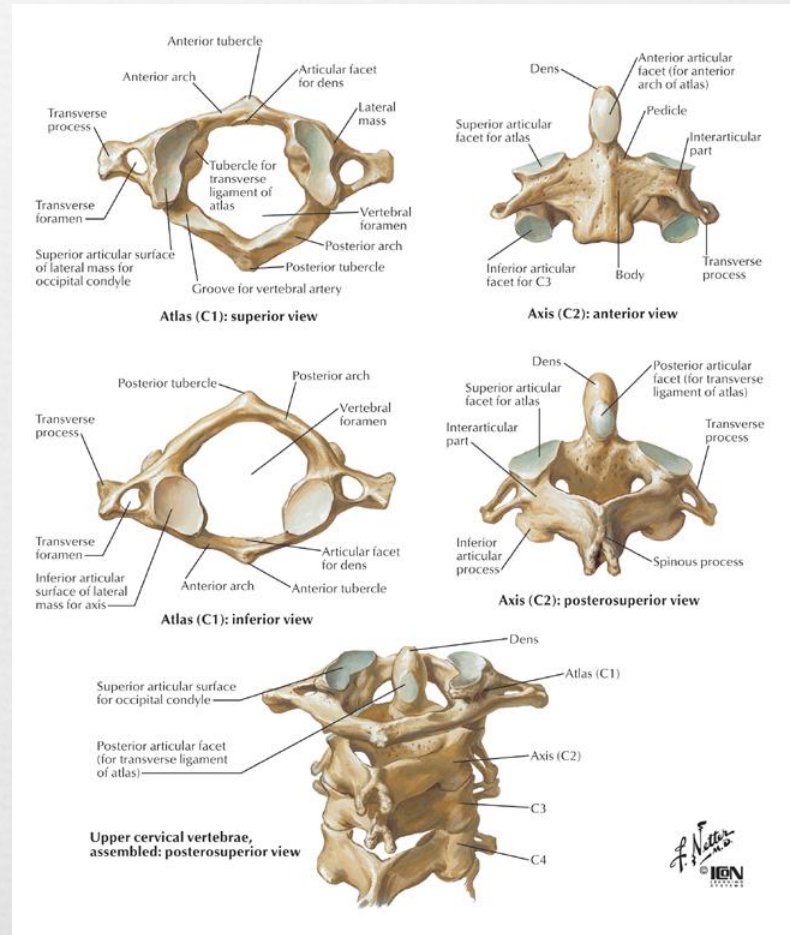
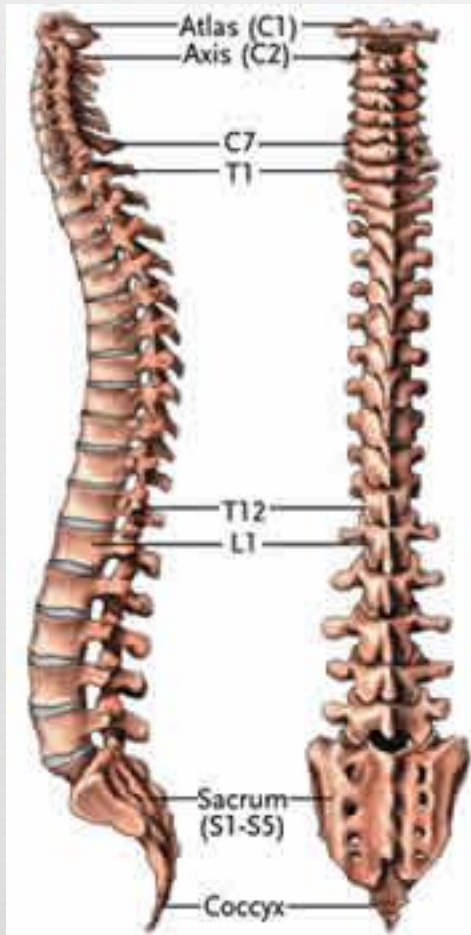
Waleed M. Awwad, MD. FRCSC
Assistant professor and Consultant
Orthopedic Surgery department

Objectives

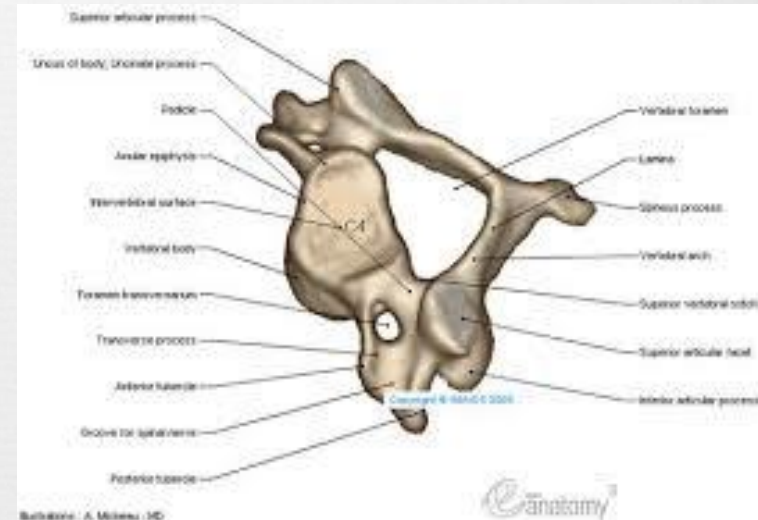
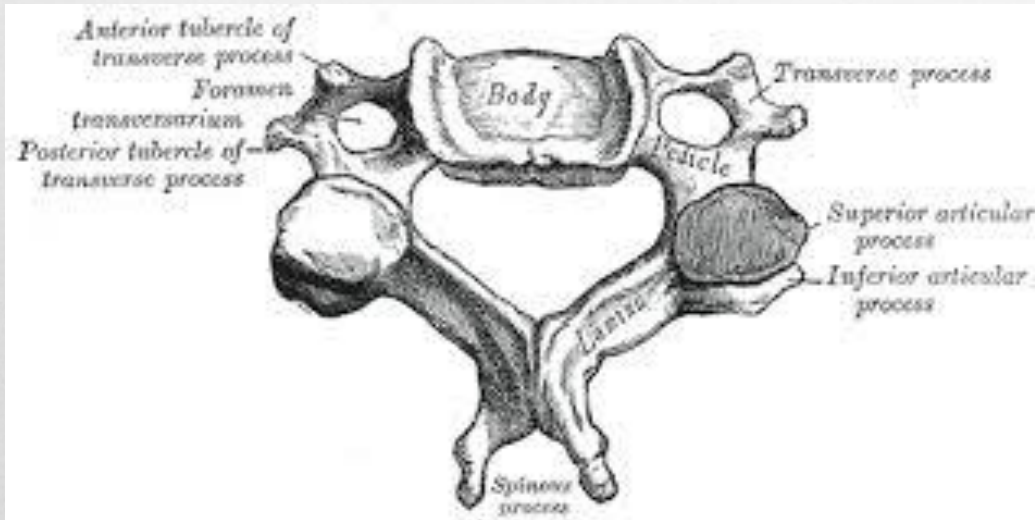


- ❧ Comprehension of the common spine disorder
 - ❧ Disc degeneration/hernia
 - ❧ Spinal stenosis
 - ❧ Common spinal deformity (Spondylolisthesis, Scoliosis)
 - ❧ Osteoporotic fracture
 - ❧ Destructive spinal lesions

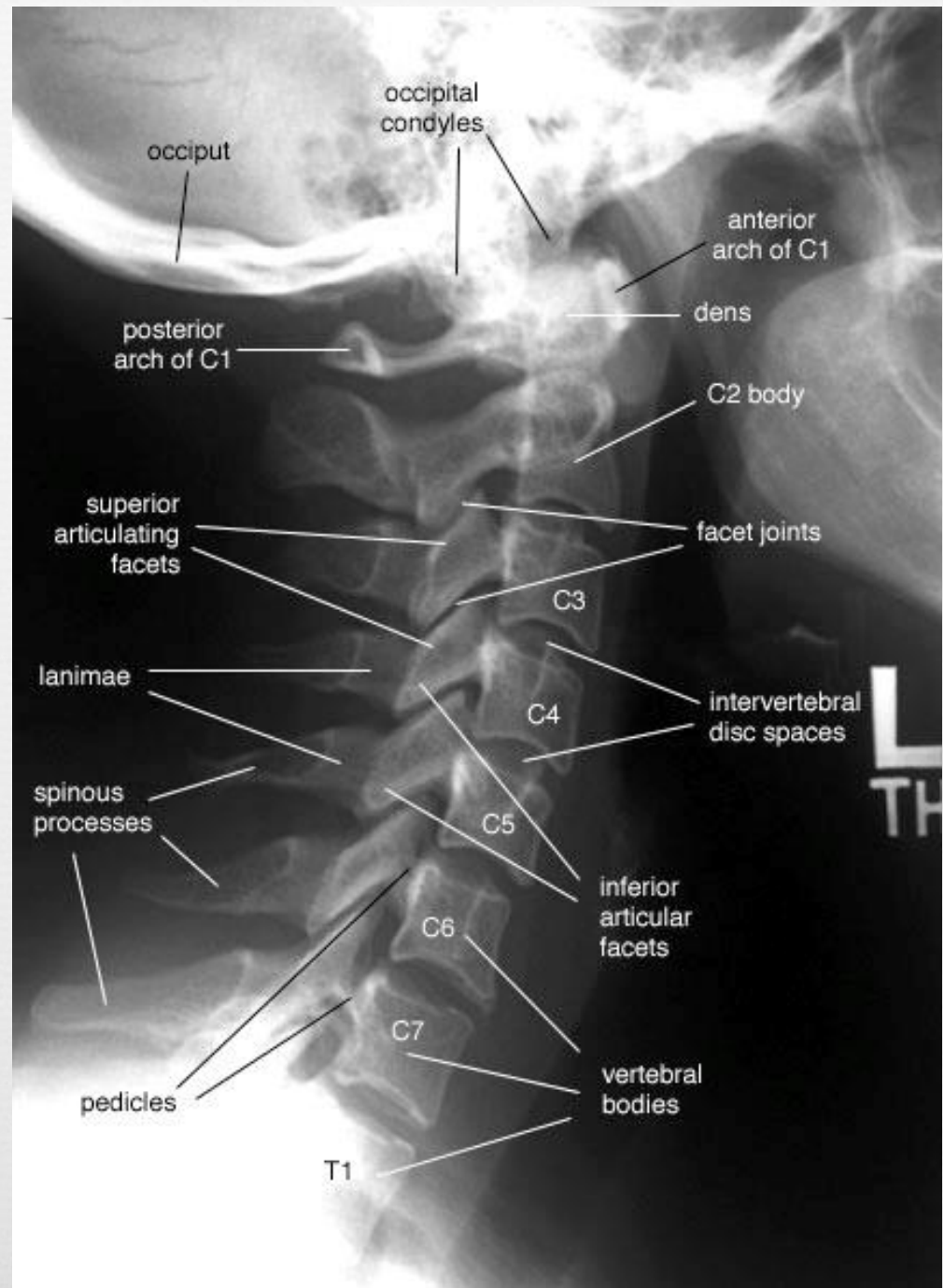
Anatomy



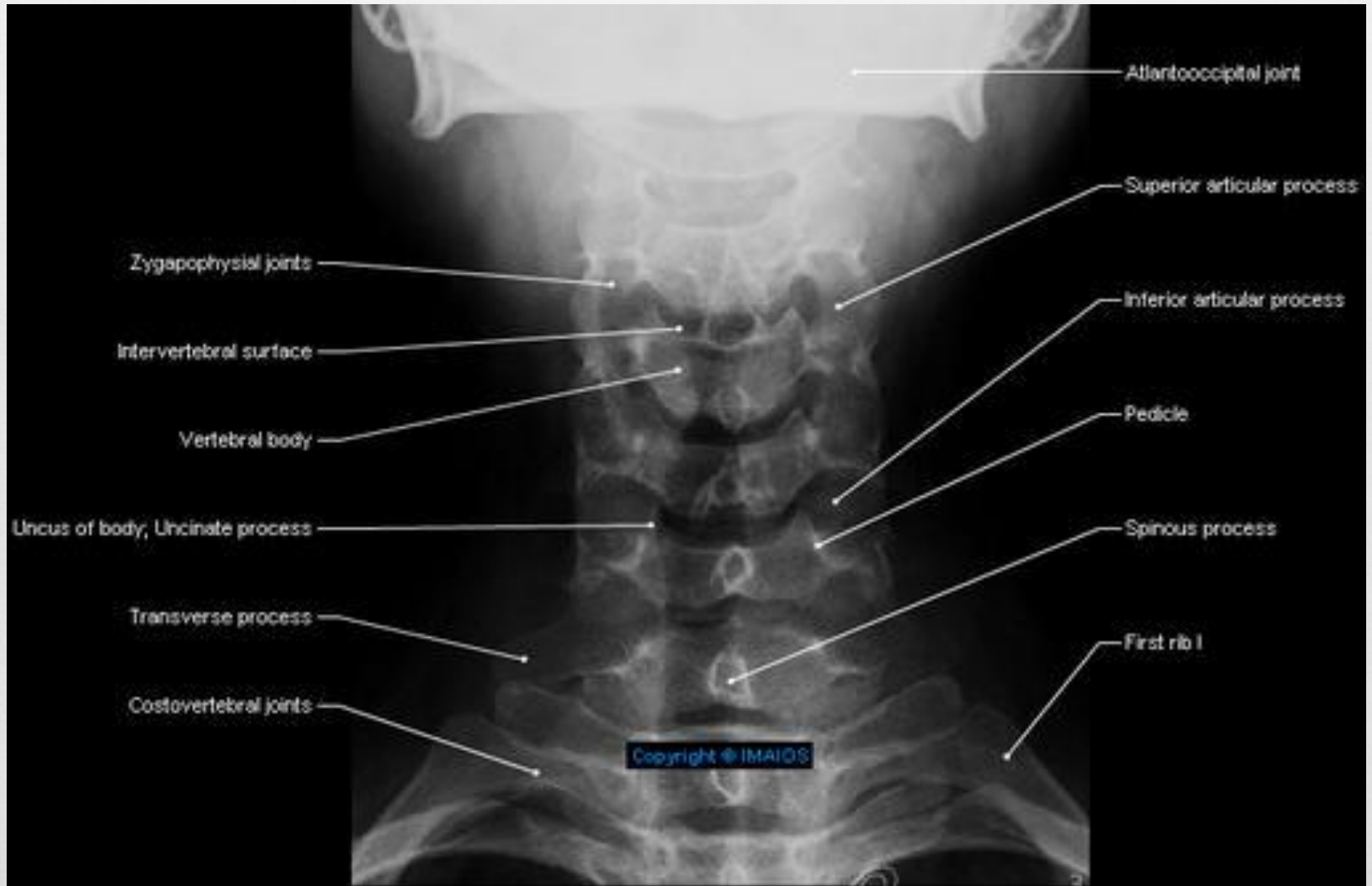
Anatomy



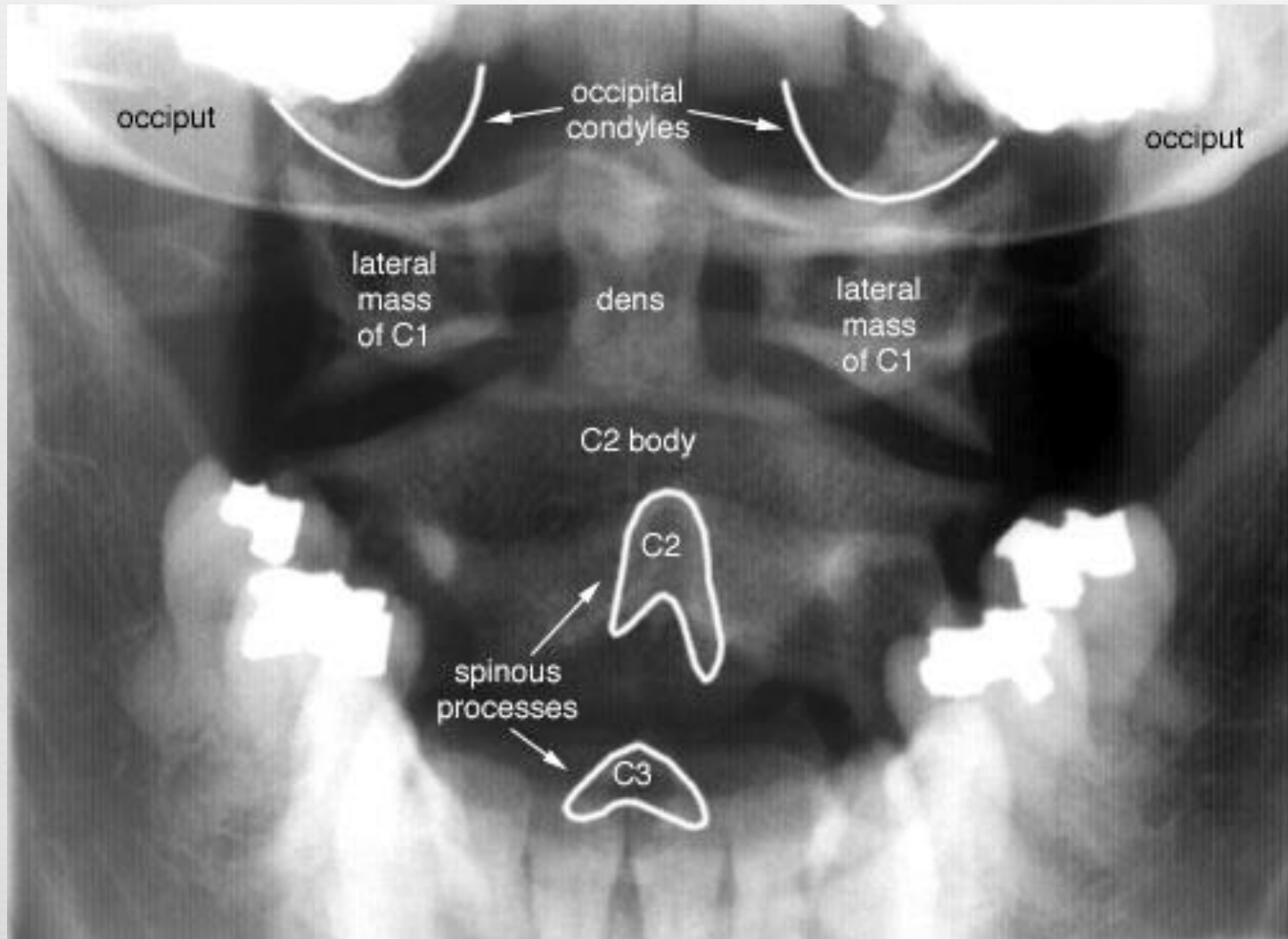
Anatomy



Anatomy



Anatomy

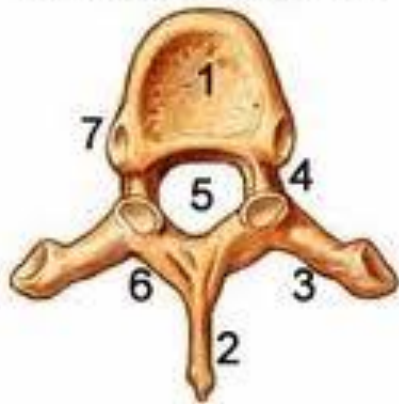


Anatomy

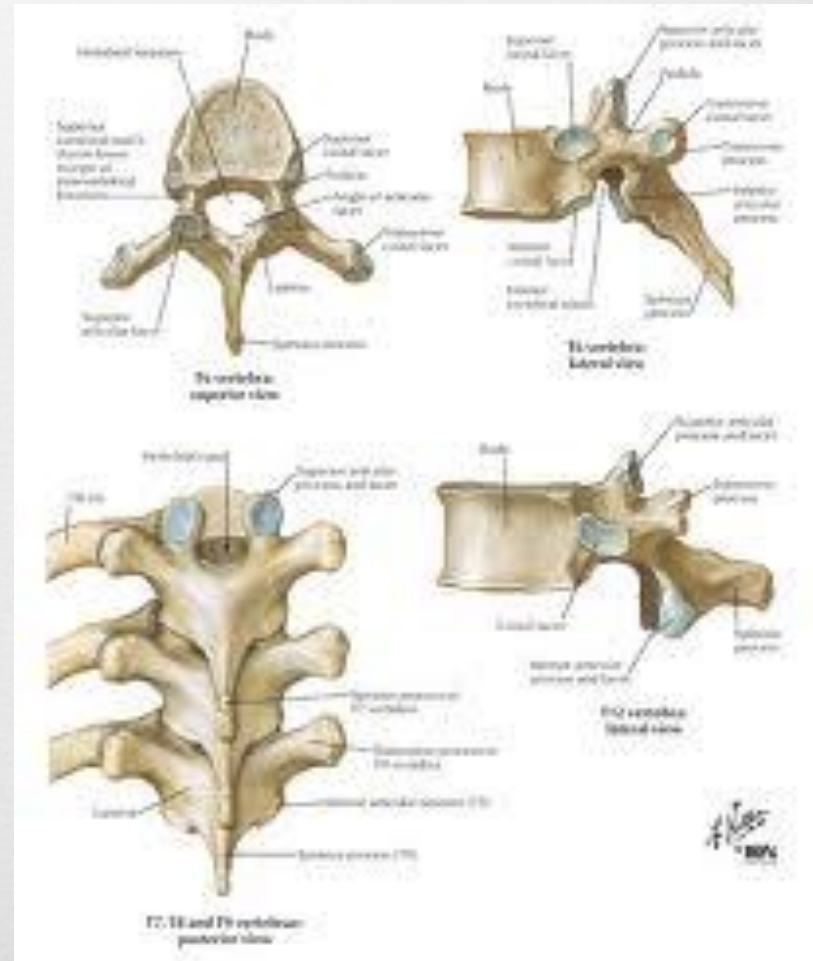


Thoracic Vertebrae

Axial (Overhead) View



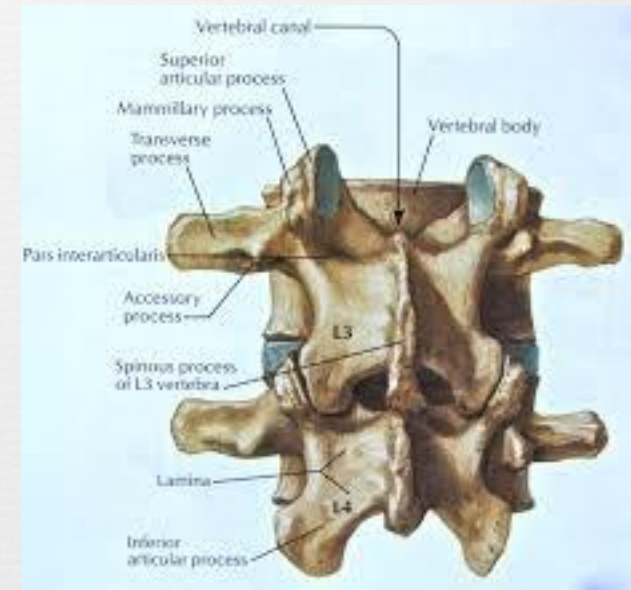
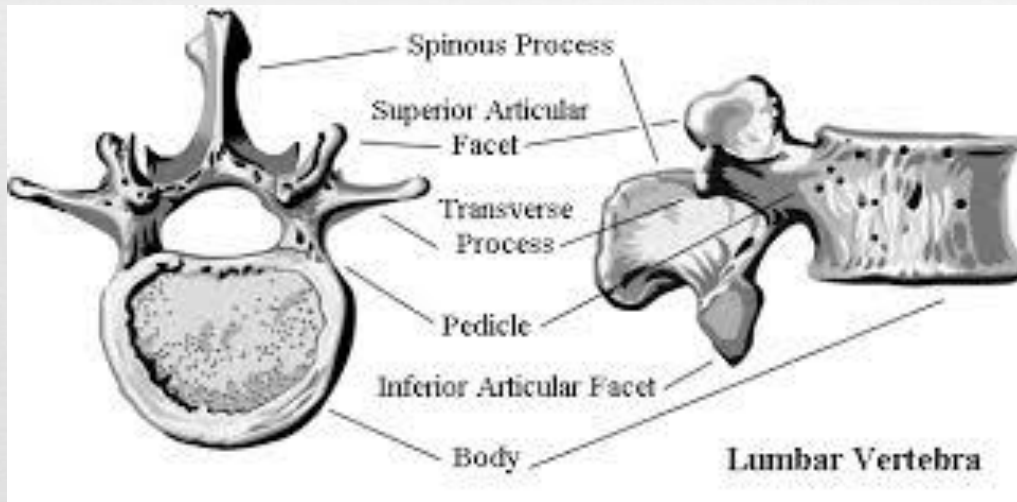
Lateral (Side) View



Anatomy



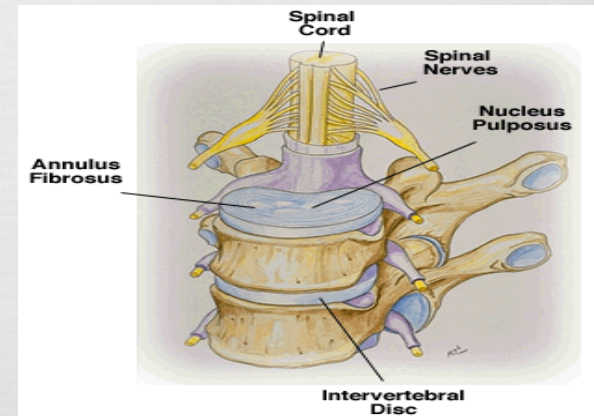
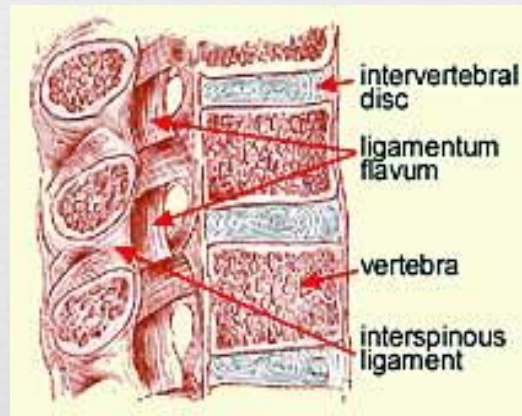
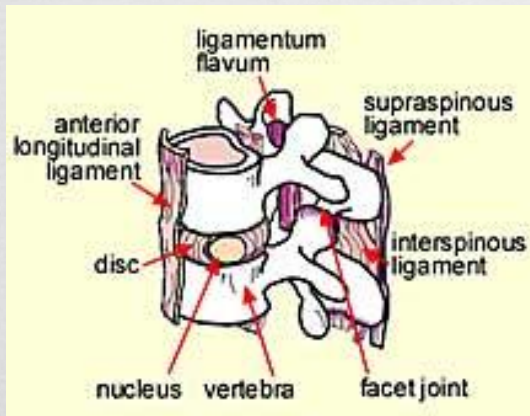
Anatomy



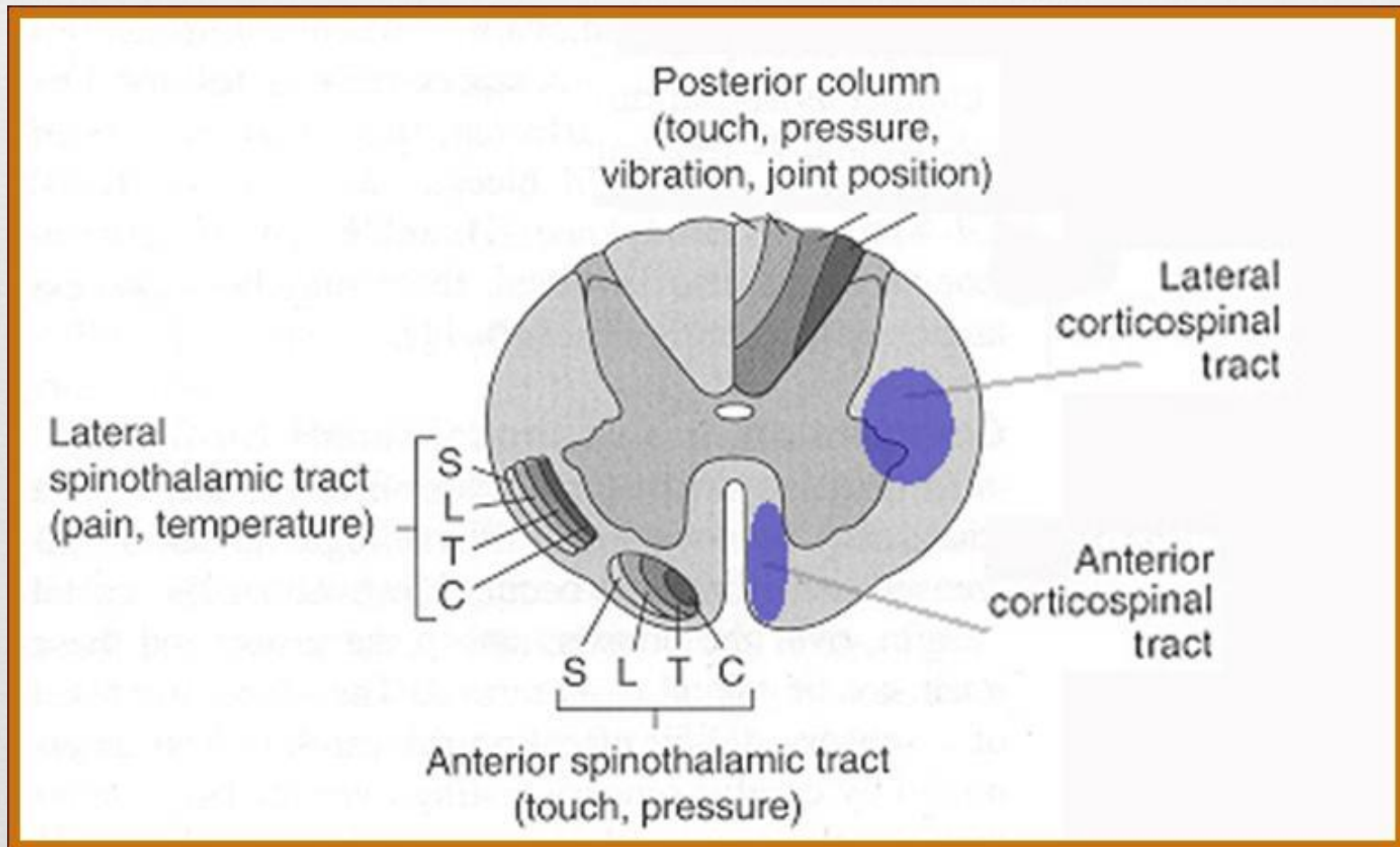
Anatomy



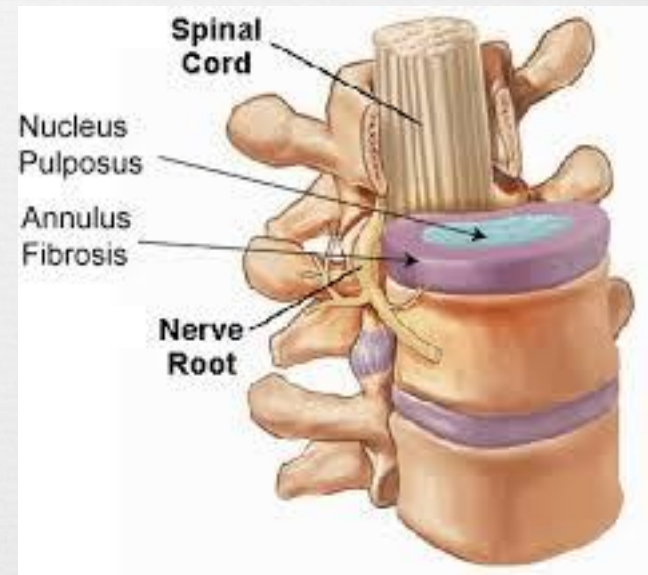
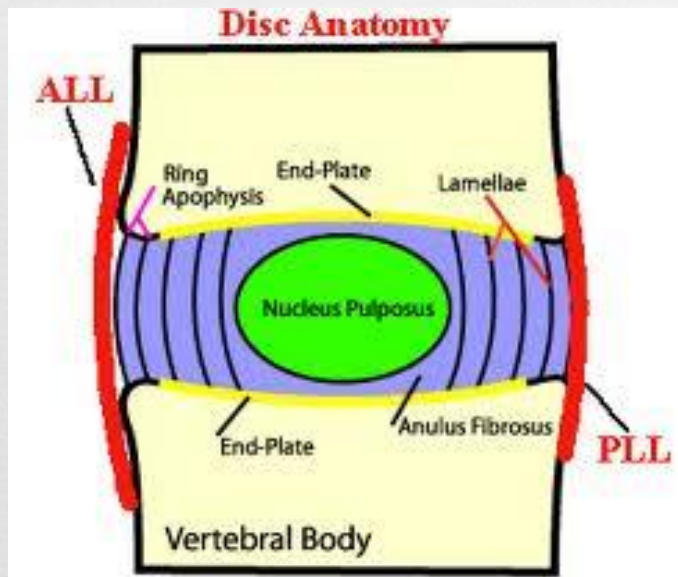
Anatomy



Anatomy



Anatomy

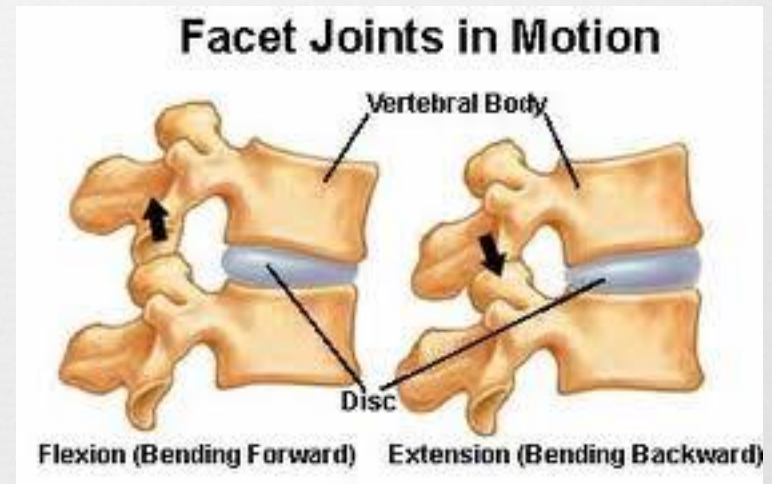


Pathophysiology IVD



- Spinal motion segment.
 - Two adjacent vertebrae.
 - Three joint complex.
 - Ligaments.

- Degeneration of IVD.



Pathophysiology IVD



- ↻ Degeneration of IVD.
 - ↻ Loss of cellular material and hydration.
 - ↻ Loss of disc height.
 - ↻ Abnormal loading to the facet.
 - ↻ Facet joints degeneration (Loss of height + facet OA).
 - ↻ Spinal stenosis +/- instability.

Pathophysiology IVD

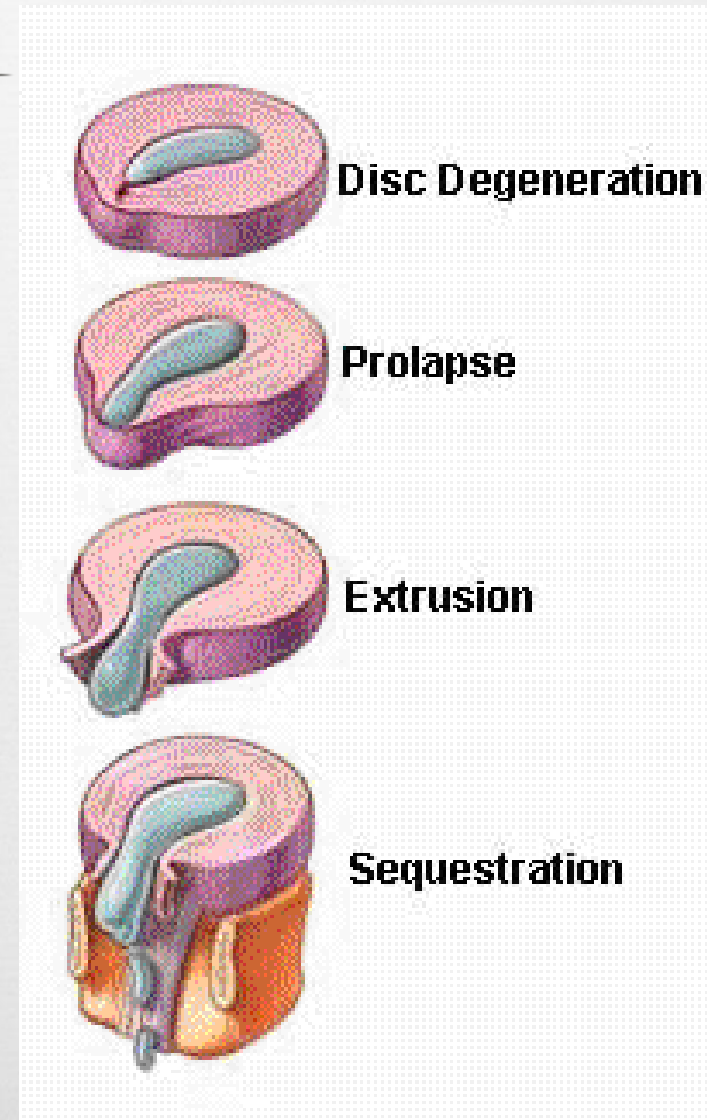
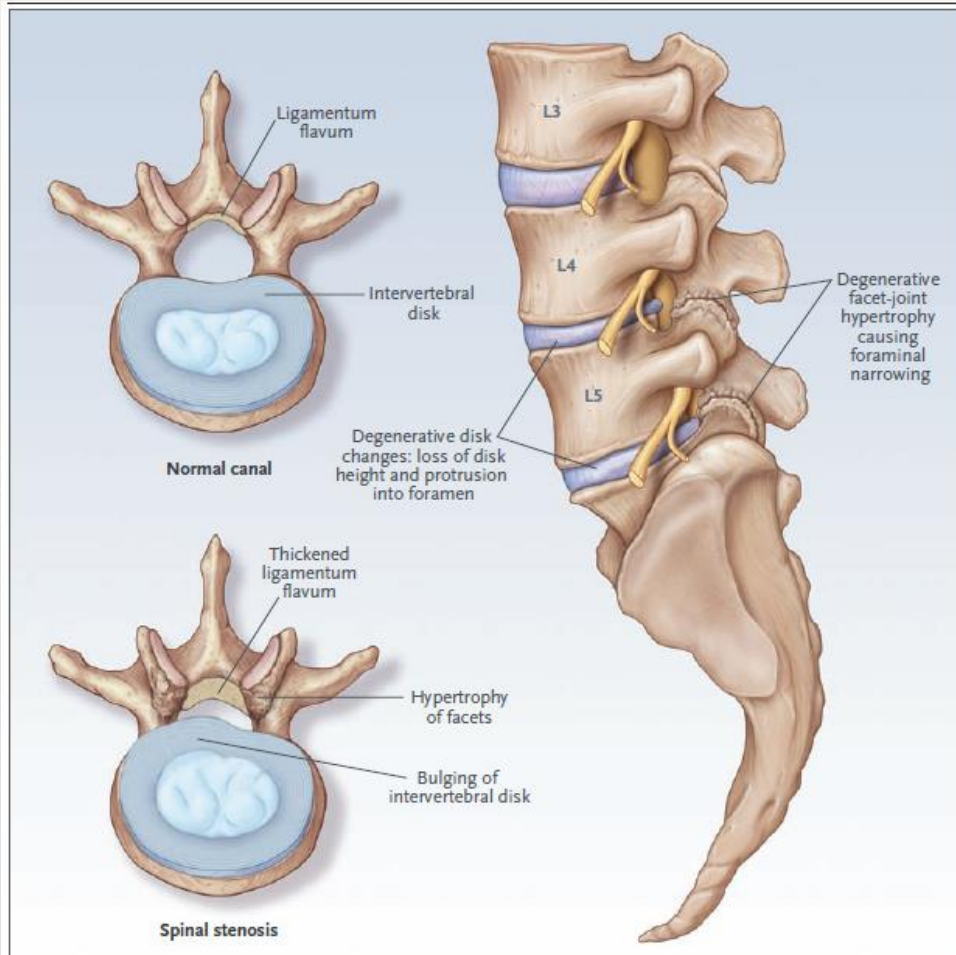


Figure 1. Pathoanatomical Features of Degenerative Lumbar Spinal Stenosis.

The axial view in the upper left shows a cross-section of a normal lower lumbar spine. The axial view in the lower left shows a cross-section of the lumbar spine with features that are consistent with lumbar spinal stenosis, including bulging of the intervertebral disk, thickening of the ligamentum flavum, and hypertrophy of the facet joints. The sagittal view on the right shows loss of disk height, disk protrusion, and facet-joint osteoarthritis, all leading to foraminal stenosis.

Clinical presentation



- ❧ Mechanical pain
 - ❧ Degeneration +/- Instability
 - ❧ Axial pain
 - ❧ Activity related

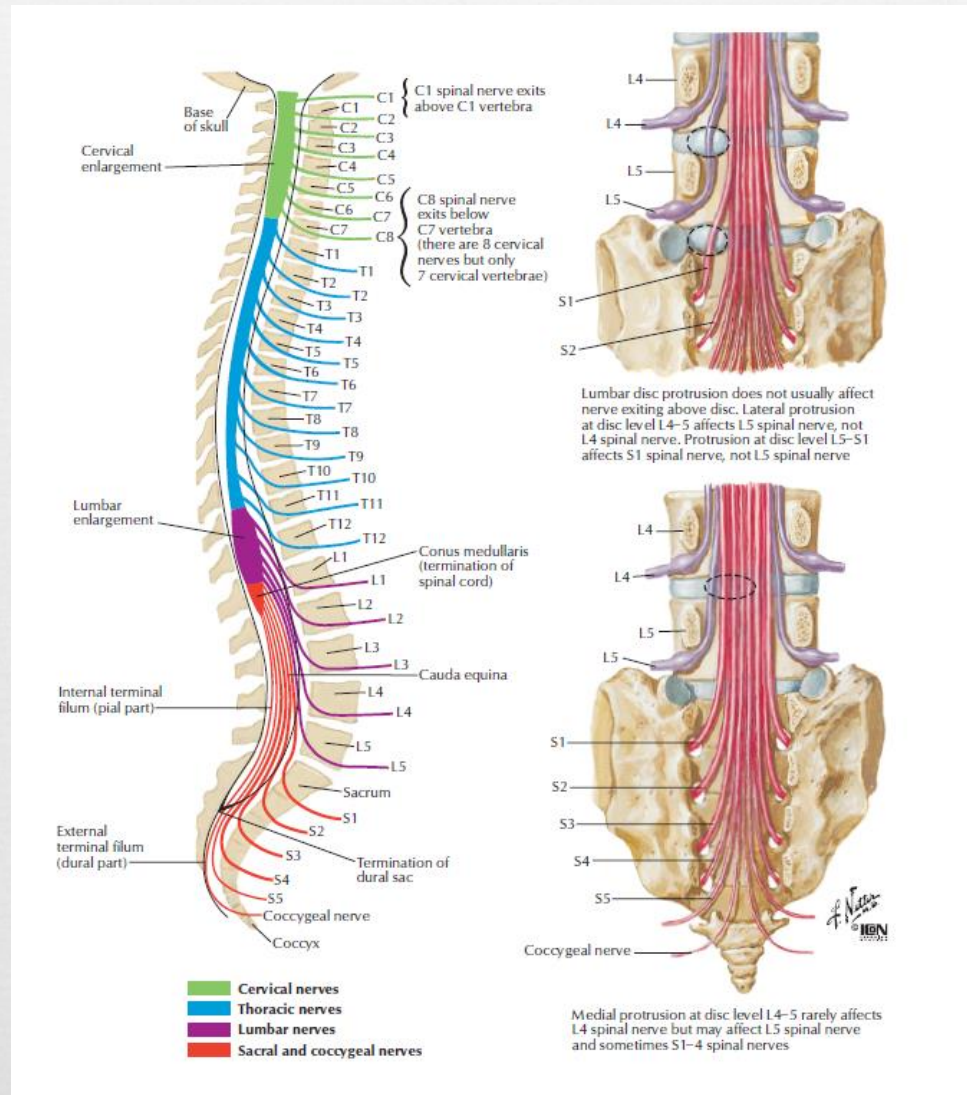
- ❧ Neurological symptom
 - ❧ Spinal cord: Cervical and Thoracic
 - ❧ Nerve roots
 - ❧ Cauda equina
 - ❧ Spinal stenosis

Clinical presentation



- ❧ Neurological symptom
 - ❧ Spinal cord:
 - ❧ Cervical: Myelopathy (CSM)
 - ❧ Spinal cord injuries: complete vs incomplete
 - ❧ Nerve roots: Sciatica
 - ❧ Cauda equina: Prevalence 0.0004/LBP But Serious
 - ❧ Spinal stenosis: Neurogenic claudication

Clinical presentation



Clinical presentation



Table III.^{22,32} Differences between neurogenic and vascular claudication

| Symptom/sign | Neurogenic Claudication | Vascular Claudication |
|-----------------------|--|------------------------------|
| Pain | Proximal to distal | Distal to proximal |
| Relief of symptoms | Relieved by sitting/forward bending | Relieved by standing |
| Walking up hill | Better | Worse |
| Walking down hill | Worse | Better |
| Cycling | No symptoms | Symptoms present |
| Walking distance | Variable | Fixed |
| Neurological symptoms | Commonly present | Not present |
| Neurological signs | May be positive especially after walking | Negative |
| Pulse | Present | Absent |
| Skin | No changes | Atrophic changes |

Management



- ❧ Cervical spine (CSM)
- ❧ Lumbar spine

- ❧ Conservative always first
- ❧ Surgical indication
- ❧ Surgical procedures

Management



- ❧ Cervical spine: axial neck pain and radiculopathy, without neurological deficits

- ❧ Conservative:
 - ❧ rest and short period of immobilization
 - ❧ Physiotherapy: ROM and strengthening
 - ❧ Pain management
 - ❧ Neuropathic medication for radiculopathy

Management



❧ Cervical spine:

❧ Surgical indication:

- ❧ Cervical stenosis causing cervical myelopathy
- ❧ Disc hernia causing radiculopathy associated with weakness
- ❧ Failure of conservative managements

Management



❧ Cervical spine:

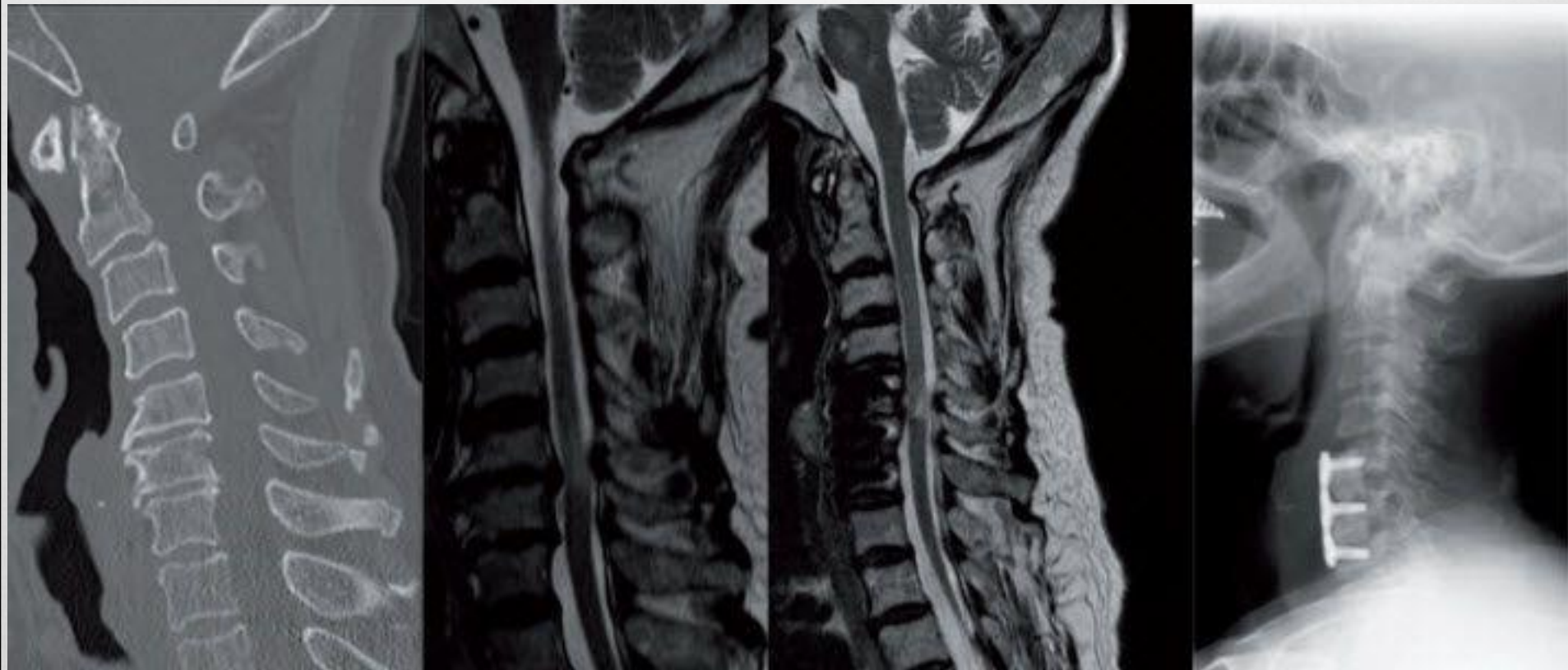
❧ Surgical procedures:

- ❧ Anterior cervical discectomy and fusion
- ❧ Posterior laminectomy +/- fusion
- ❧ Laminoplasty
- ❧ Cervical disc arthroplasty

Surgical procedure



Anterior discectomy and fusion



Surgical procedure

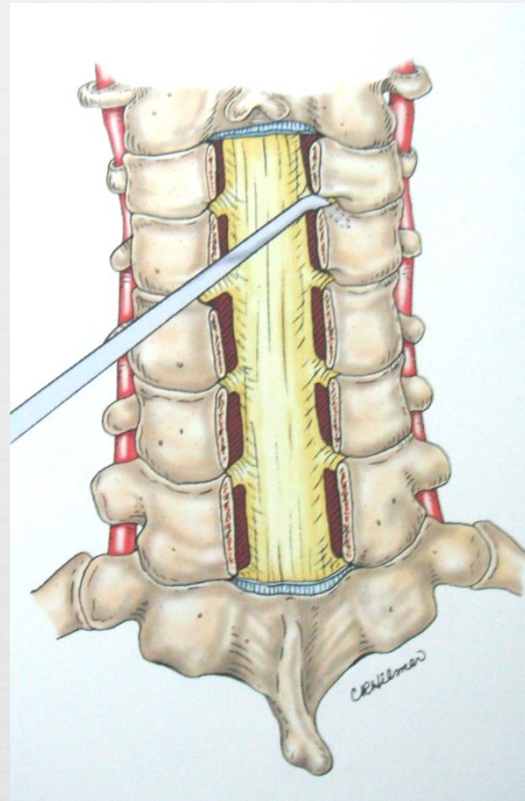
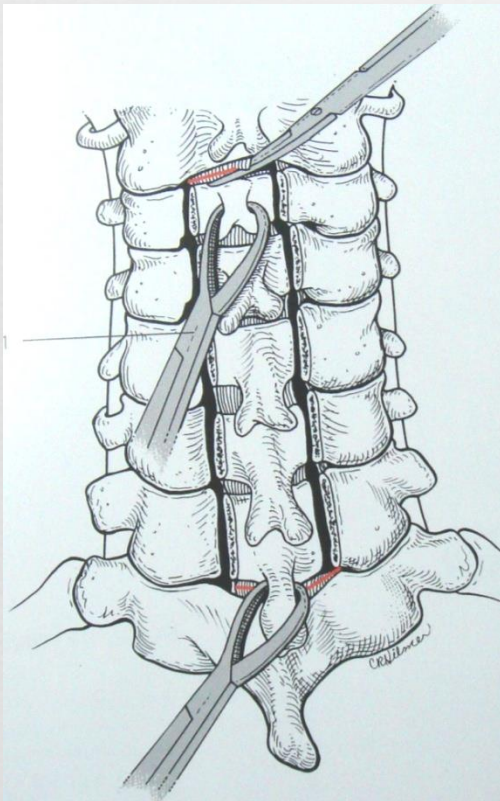
Laminectomy and fusion



Surgical procedure



Laminectomy



Management



- ❧ Lumbar spine:
 - ❧ Disc hernia
 - ❧ Axial LBP
 - ❧ Spinal stenosis

Management



- ∞ Lumbar spine (acute disc hernia): 90% resolved within 12 weeks
- ∞ Conservative: short period of rest, PT, Pain management (non-invasive and invasive)
- ∞ Surgical indication: Cauda equina, motor deficit and failure of 3 months conservative treatment
- ∞ Surgical procedure: Discectomy

Management



Management

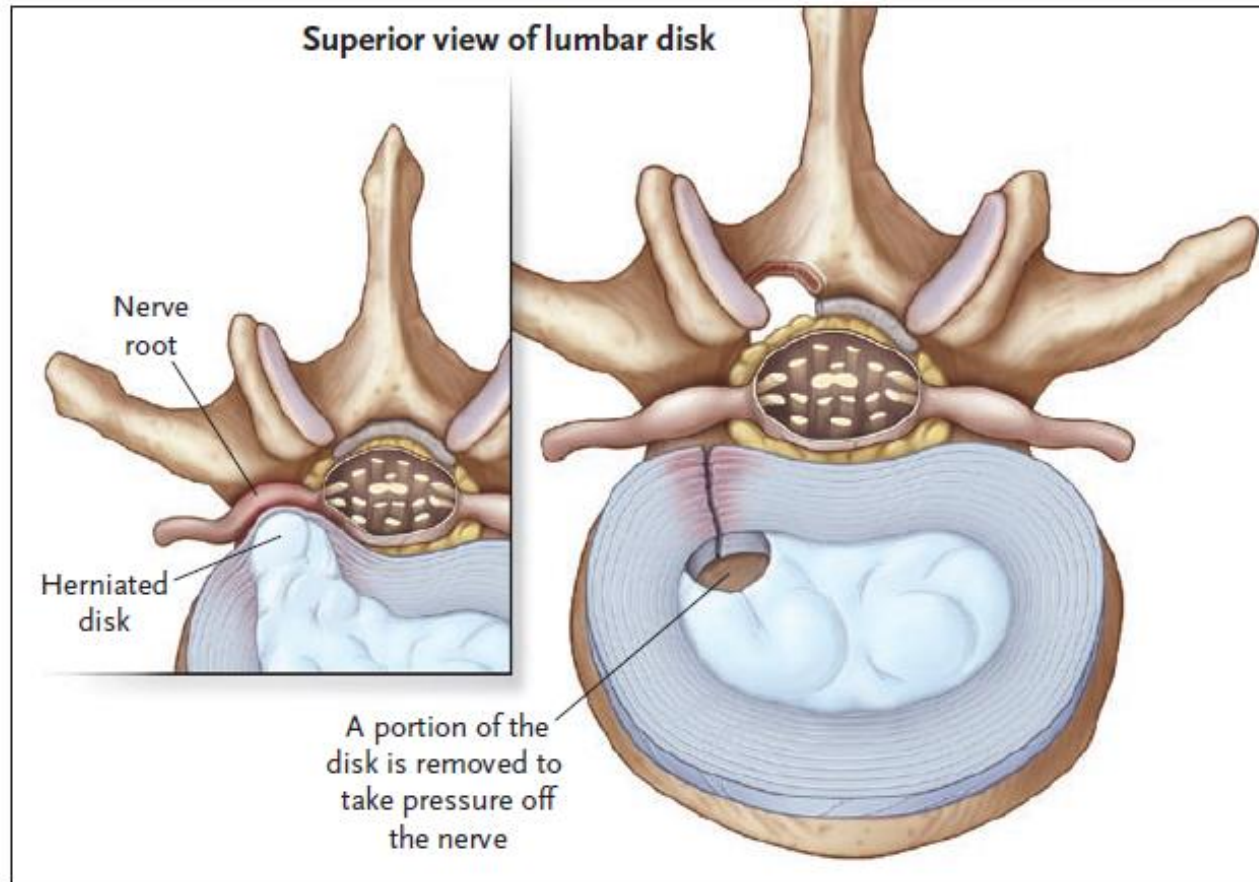


Figure 2. Conventional Discectomy.

The protruding segment of the disk that is causing nerve-root compression is excised. The remainder of the disk is usually left undisturbed.

Management



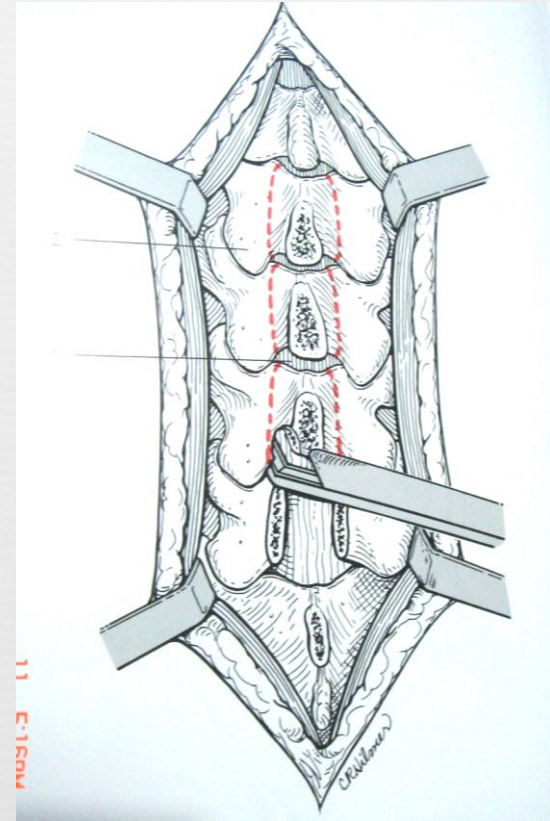
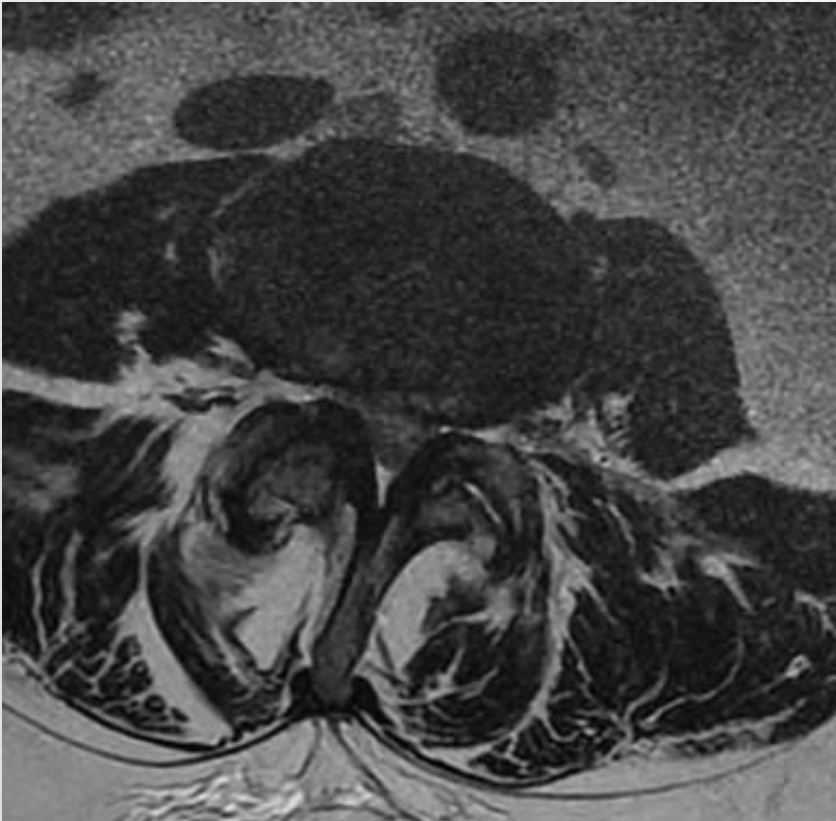
- ❧ Lumbar spine (Axial LBP): Conservative is the mainstay
- ❧ Conservative: PT, Pain management (non-invasive and invasive)
- ❧ Surgical indication: deformity , instability and failure of conservative treatment

Management

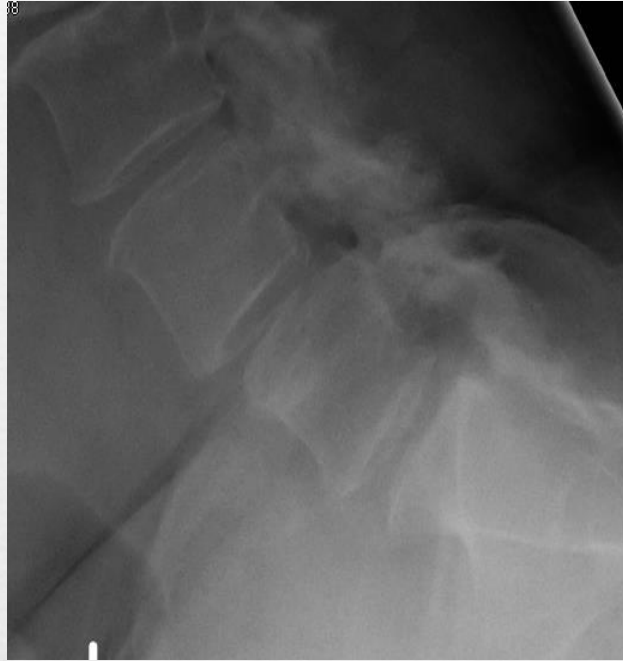
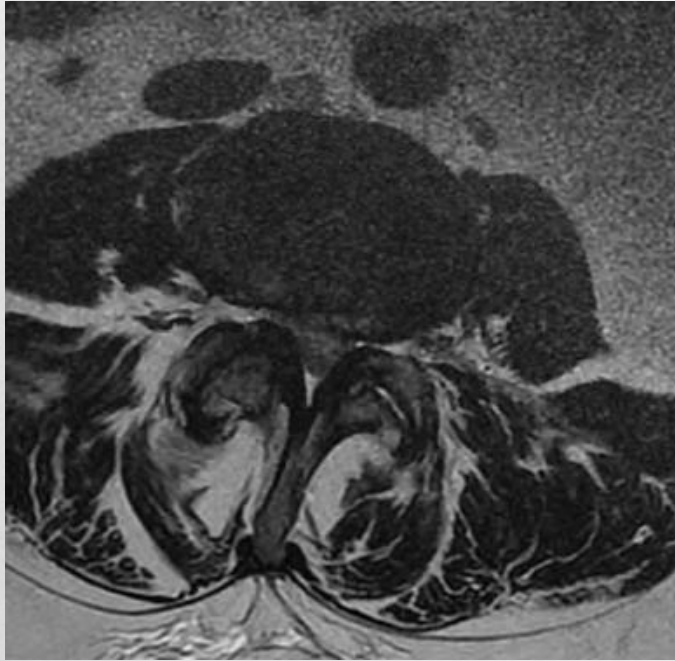


- ❧ Lumbar spine (Spinal stenosis):
 - ❧ Conservative: PT, Pain management (non-invasive and invasive)
 - ❧ Surgical indication: Motor deficit, severe neurogenic claudication and failure of 6+ months of conservative treatment
 - ❧ Surgical procedure: Laminectomy is the commonest

Management



Management



Spinal deformities



↻ Common spinal deformities:

↻ Scoliosis (less common Kyphosis or combined)

↻ Spondylolisthesis

Spinal deformities



∞ Causes of scoliosis:

- ∞ Congenital
- ∞ Syndromic
- ∞ Neuromuscular
- ∞ Idiopathic: most common type

Spinal deformities



- ❧ Adolescent idiopathic scoliosis:
 - ❧ Between 10 and 14 years
 - ❧ Vertebral rotation
 - ❧ Deformity without significant pain
 - ❧ Normal neurological examination
 - ❧ Surgical indication: 45 degrees or more
 - ❧ Surgical procedure: instrumented PSF

Spinal deformities



∞ Adolescent idiopathic scoliosis:



Spinal deformities

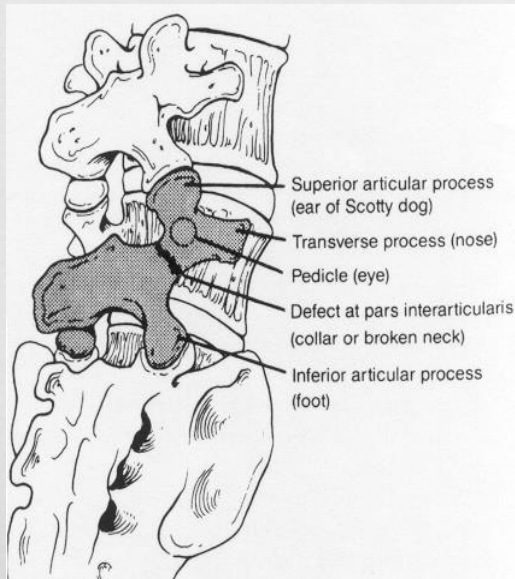


∞ Spondylolysis

∞ Is a defect in the pars interarticularis

∞ Plain lateral radiograph 80%, oblique another 15%

∞ Single photon emission computed tomography



Spinal deformities

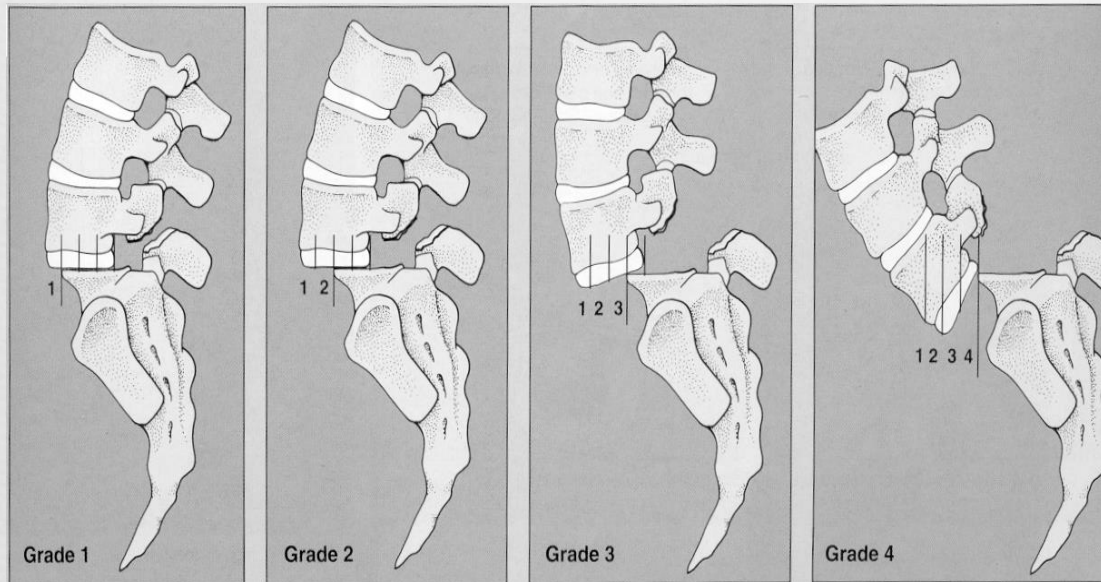


- ❧ Spondylolisthesis: Displacement of a vertebra in relation to a vertebra below
- ❧ Most people are asymptomatic
- ❧ Commonest causes are:
 - ❧ Degenerative
 - ❧ Isthmic
- ❧ Severity according to the degree of displacement
- ❧ Surgical indication: grade 3 or more, failed conservative
- ❧ Surgical procedure: according to severity. Instrumented PSF +/- interbody fusion is the commonest

Spinal deformities



∞ Spondylolisthesis



∞ Grade 5: spondyloptosis.

Spinal deformities



∞ Spondylolisthesis



Pathologic fractures



- ❧ Low-energy fractures
- ❧ Osteoporotic is common
- ❧ Usually due to infection or tumour
- ❧ X-rays: “winking owl” sign

Spine Pathology Red Flag Conditions

☞ Beware of:

- 1) Cauda Equina/severe neurologic injury (perianal numbness, decreased rectal tone, loss of movement in the extremities)
- 2) Tumour weakening the vertebrae (causing cord compression or vertebral fracture)
- 3) Infection weakening bone (causing disc/vertebral destruction or cord compression)
- 4) Traumatic Spine Fracture (causing vertebral angulation, pain, or neuro compromise).

Remember that spine fracture can occur without trauma



Destructive Spinal Lesions



- ❧ Present with pain at rest or at night
- ❧ Associated with constitutional symptoms
- ❧ Most common causes
 - ❧ Infection
 - ❧ Tumors
- ❧ Vertebral body and pedicle are the commonest sites of pathology

Spinal Tumors



- ❧ Primary Spinal tumors:
 - ❧ Rare
 - ❧ Benign (e.g. osteoid osteoma) or malignant (e.g. chordoma)
 - ❧ Management depends on pathology

- ❧ Spinal metastasis
 - ❧ Very common
 - ❧ Biopsy required if primary unknown

Spinal infections



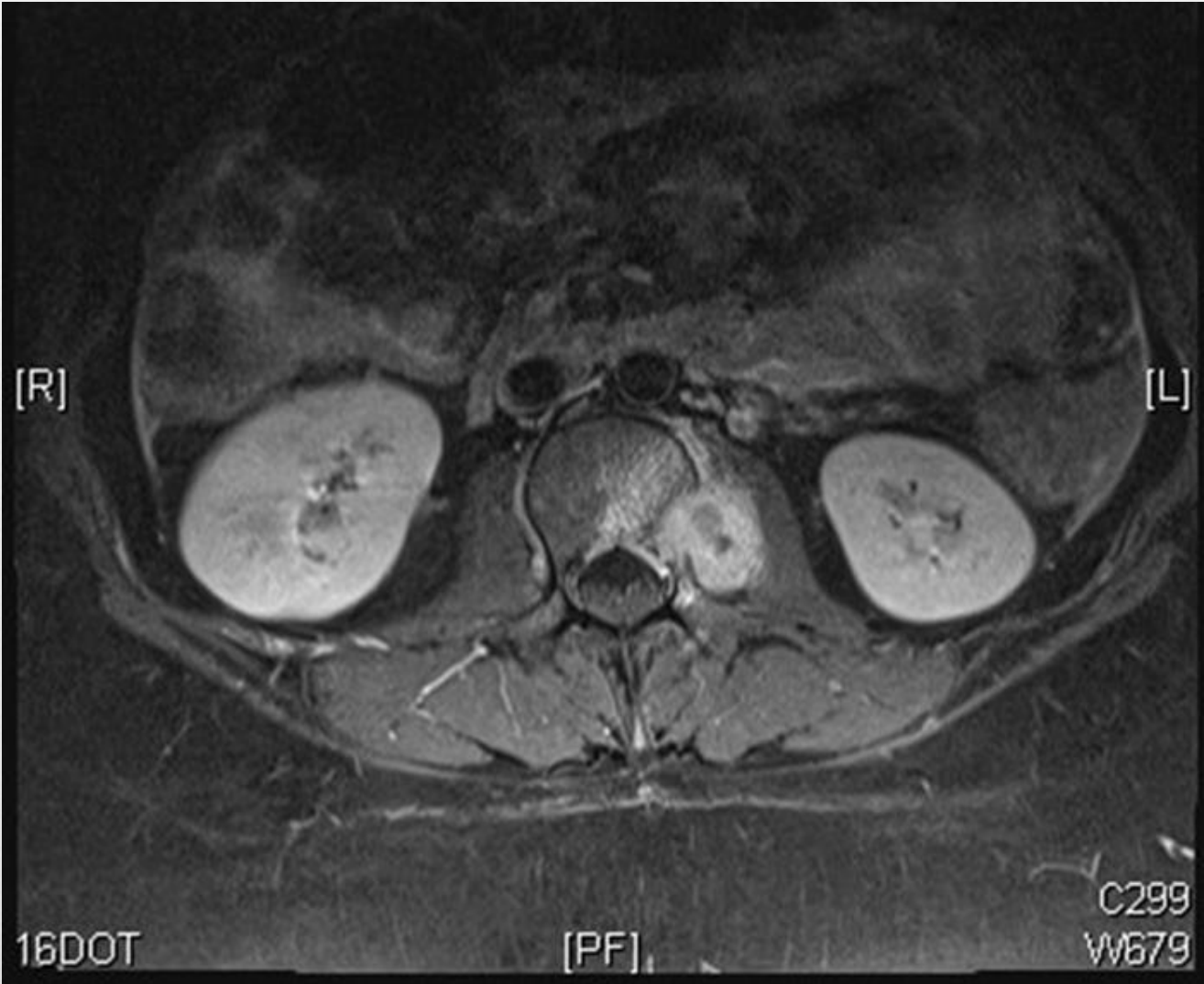
- ❧ Most common is TB and Brucellosis
- ❧ History of contact with TB patient, raw milk ingestion
- ❧ Potentially treatable diseases once diagnosis is established and antimicrobials administered

Osteoporotic fracture



- ❧ Pathological fractures
- ❧ Common injury post menopausal, if repetitive will result in loss of height and kyphotic deformity.
- ❧ Often missed
- ❧ Treatment:
 - ❧ Underlying disease

Spinal Tuberculosis (with psoas abscess)



Pathologic fractures



Questions

