

# The Spine

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# Disorders of the spine and spinal cord

Cervical spondylosis

Lumbar spondylosis

Spinal cord compression

Intrinsic diseases of the spinal cord

# Cervical spondylosis

**Cervical spondylosis** is the result of osteoarthritis in the cervical spine.

It is characterised by degeneration of the intervertebral discs and osteophyte formation.

Radiological changes are frequently found in asymptomatic individuals over the age of 50.

Spondylosis may be associated with neurological dysfunction

Cervical radiculopathy

Cervical myelopathy

# Cervical radiculopathy

Acute onset of compression of a nerve root occurs when a disc prolapses laterally.

More gradual onset may be due to osteophytic encroachment of the intervertebral foramina



# Cervical radiculopathy

## Clinical features

Pain in the neck that may radiate in the distribution of the affected nerve root.

Neck movements may exacerbate pain.

Paraesthesia and sensory loss may be found in the affected segment

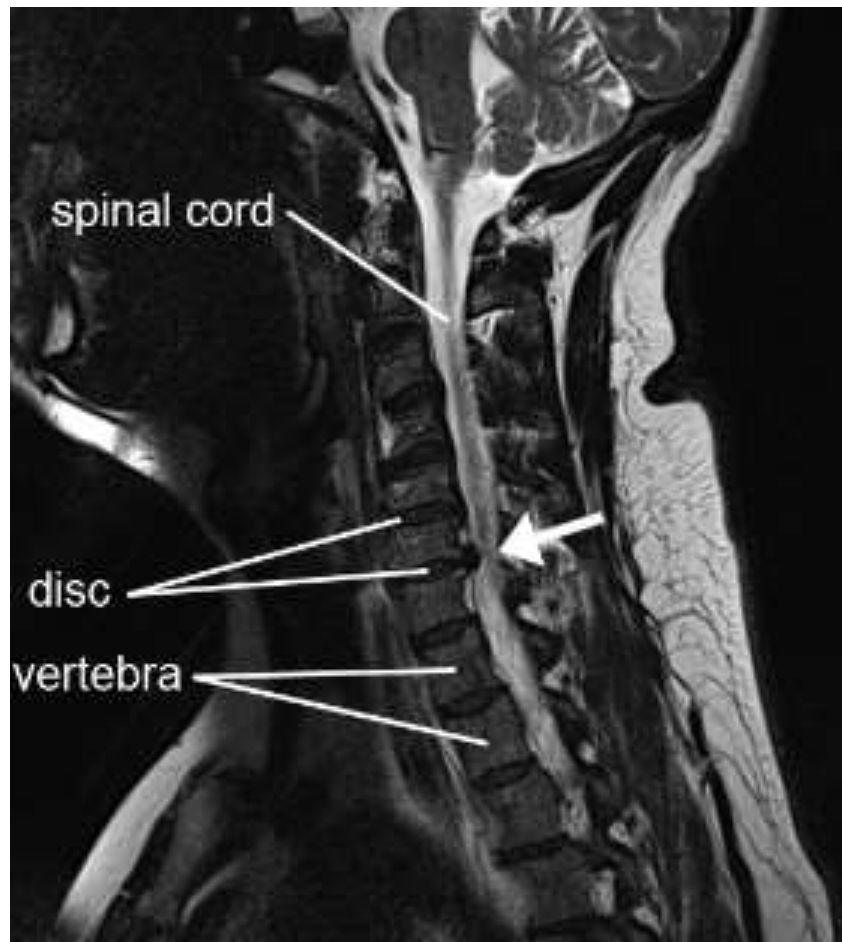
# Cervical radiculopathy

**MRI** is the investigation of choice in those with radicular symptoms.

**X-rays** offer limited benefit, except in excluding destructive lesions.

electrophysiological studies rarely add to clinical examination with MRI.

**Management** Conservative treatment with analgesics and physiotherapy results in resolution of symptoms in the great majority of patients, but a few require surgery in the form of discectomy or radicular decompression.





## Figure

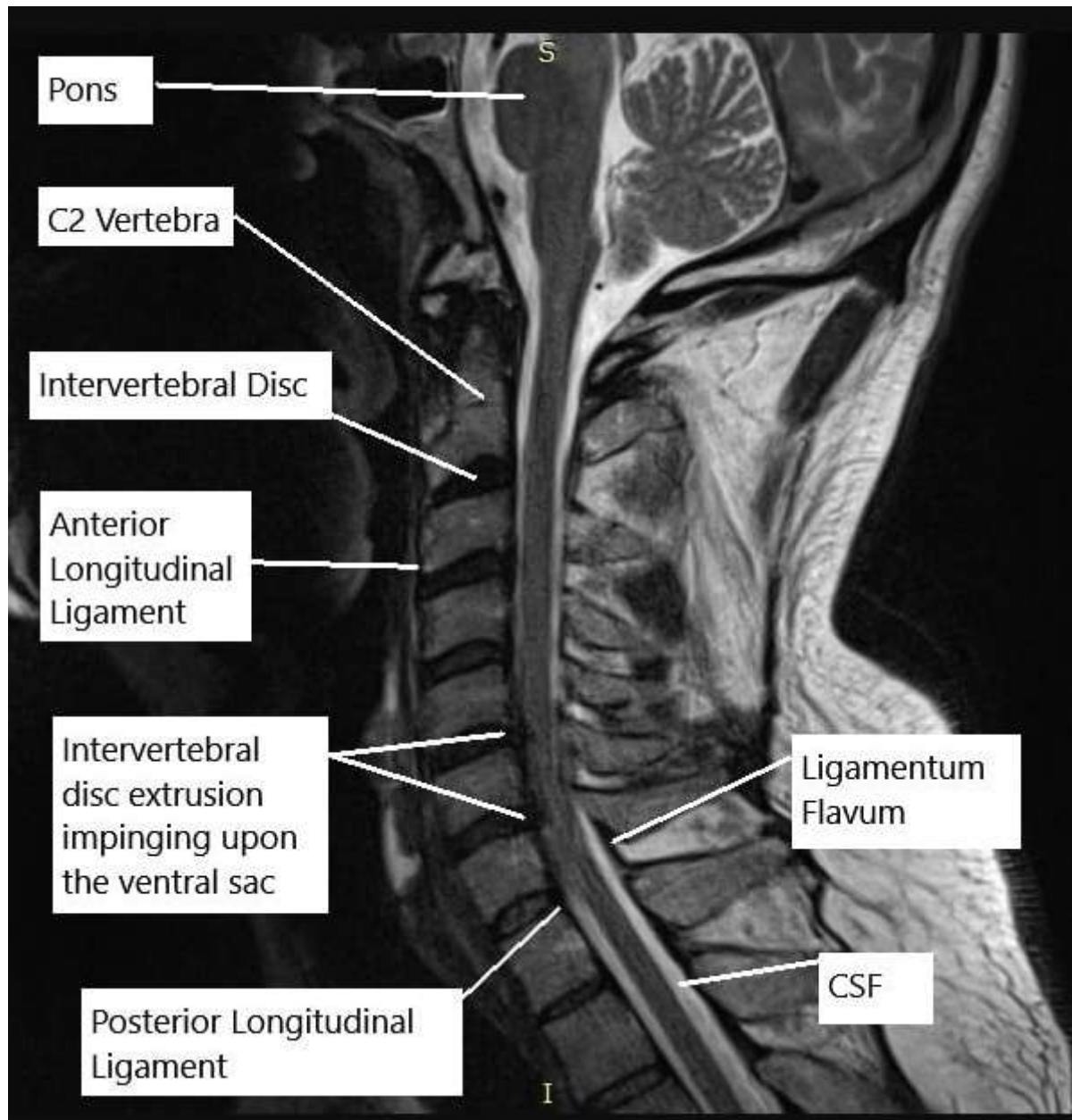
### Caption

Figure 2. T 2-weighted magnetic resonance imaging in a patient with right-sided c6 radiculopathy. (A) Sagittal view showing spondylosis at c5-c6 and c6-c7 disk levels (arrows). (B) Axial view showing a right-sided disk-osteophyte complex at c5-c6 disk level (arrow) that is putting pressure on the c6 nerve root.

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(a)



(b)



Superior view

# C4-7 Disc Herniations

Superior view



Sagittal Cervical MRI



Sagittal Cervical Spine



Axial C5-6 MRI



Axial C6-7



# Cervical myelopathy

Dorsomedial herniation of a disc  
the development of transverse bony bars or posterior osteophytes may result in pressure on the spinal cord or the anterior spinal artery, which supplies the anterior two-thirds of the cord



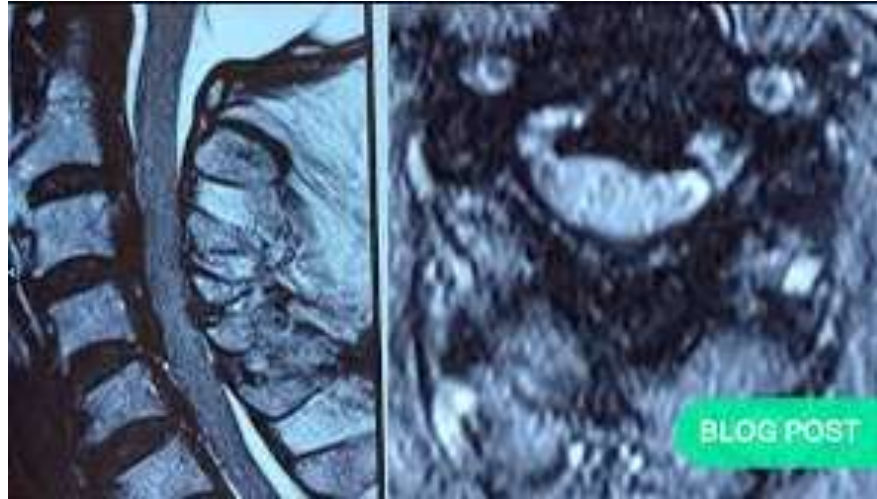
# Cervical myelopathy

**Clinical features** The onset is usually insidious and painless. Motor and Sensory loss in the upper limbs is common. Sensory manifestations in the legs are much less common. Neurological deficit usually progresses gradually and disturbance of micturition is a very late feature.

**Investigations** MRI (or rarely myelography) will direct surgical intervention. The former provides information on the state of the spinal cord at the level of compression.

**Management** Surgical decompression

Manual manipulation of the cervical spine is of no proven benefit and may precipitate acute neurological deterioration





# Lumbar spondylosis

This term covers degenerative disc disease and osteoarthritic change in the lumbar spine.

Pain in the distribution of the lumbar or sacral roots ('sciatica') is almost always due to disc protrusion

Can be a feature of other rare but important disorders, including spinal tumour, malignant disease in the pelvis and tuberculosis of the vertebral bodies

**Lumbar disc herniation**

**Lumbar canal stenosis**

# Lumbar disc herniation

The nucleus pulposus may bulge or rupture through the annulus fibrosus, giving rise to pressure on nerve endings in the spinal ligaments, changes in the vertebral joints or pressure on nerve roots.



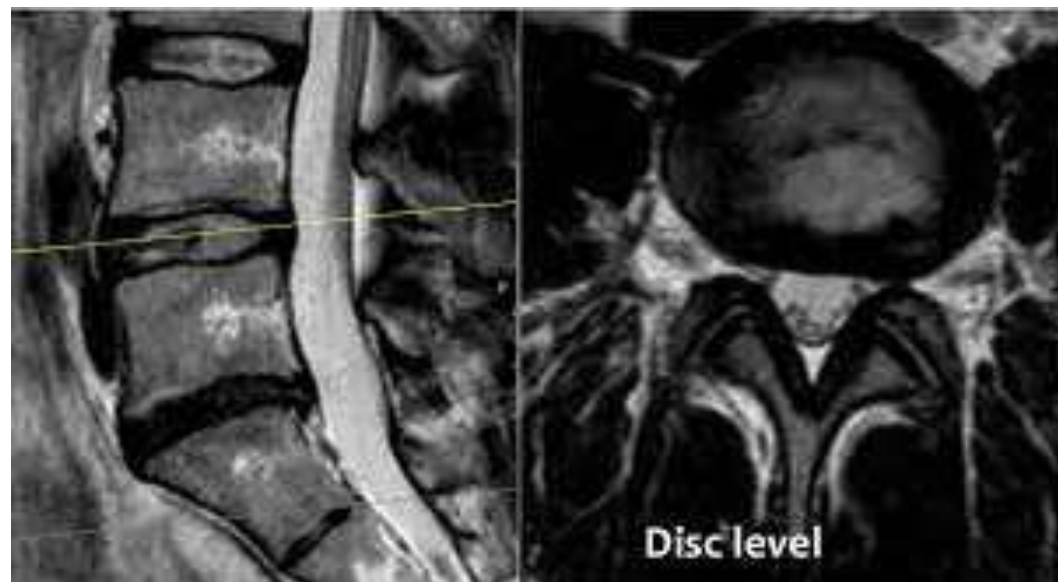
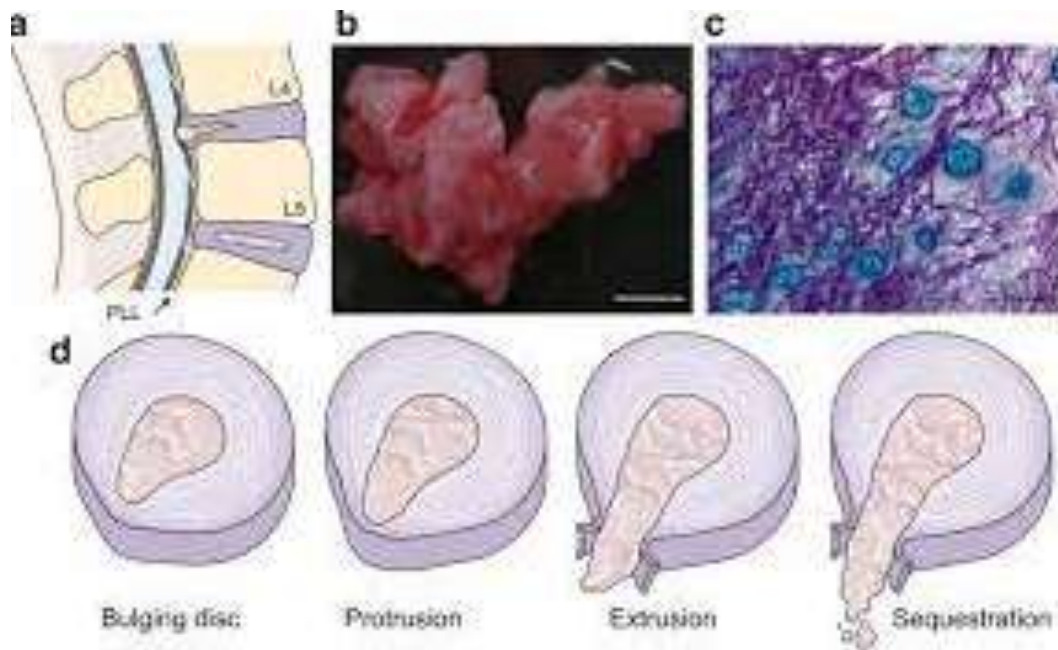


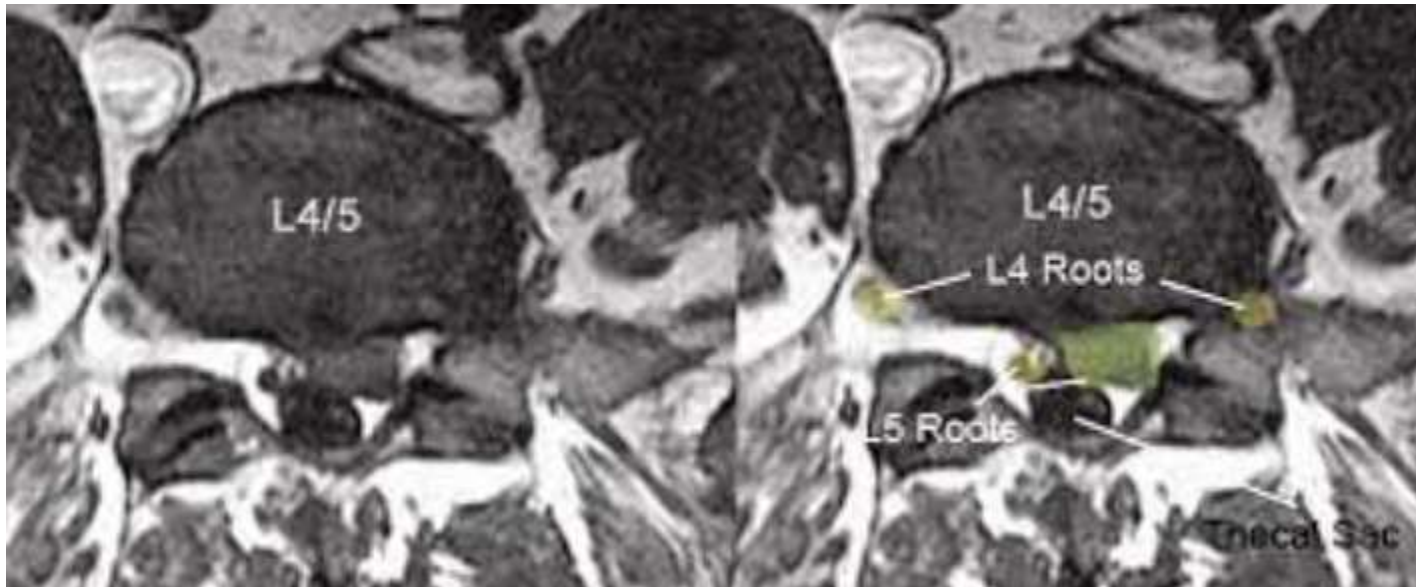
# Lumbar disc herniation

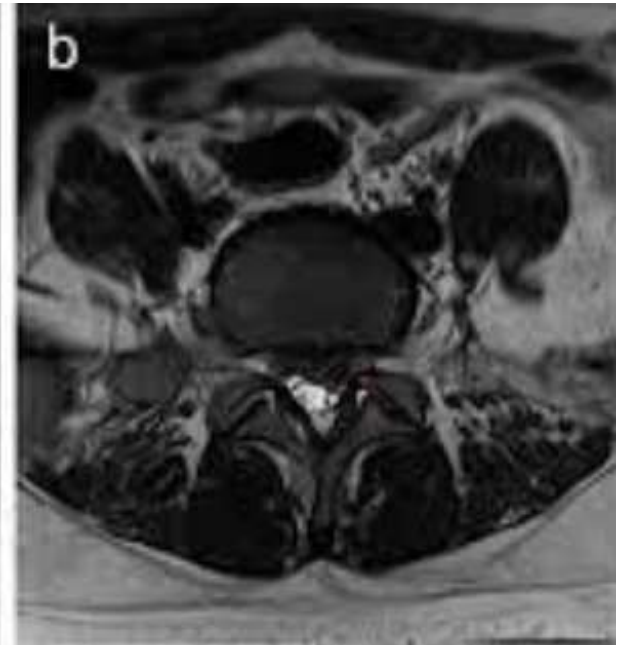
**Clinical features** : repeated episodes of low back pain , lumbar region pain and may radiate to the buttock, thigh, calf and foot. Pain is exacerbated by coughing or straining but may be relieved by lying flat.

**Investigations** **MRI** is the investigation of choice if available, since soft tissues are well imaged. **Plain X-rays** of the lumbar spine are of little value in the diagnosis of disc disease, although they may demonstrate conditions affecting the vertebral body. **CT can provide** helpful images of the disc protrusion and/or narrowing of exit foramina.

**Management:** 90% of patients with sciatica recover following conservative treatment ,Injections of local anaesthetic or glucocorticoids by ligamentous injury or joint dysfunction. Surgery if there is no response to conservative treatment .Central disc prolapse with bilateral symptoms and signs and disturbance of sphincter function requires urgent surgical decompression







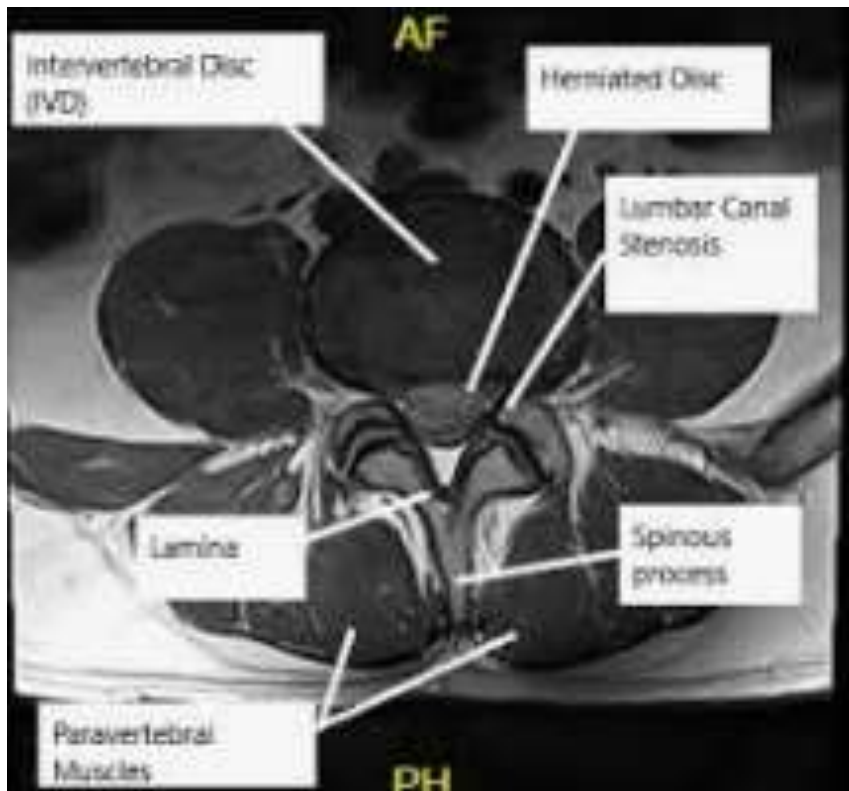
# Lumbar canal stenosis

**Clinical features** usually elderly, develop exercise-induced weakness and paraesthesia in the legs .are quickly relieved by a short period of rest.

**Investigations** The investigation of first choice is MRI, but contraindications (body habitus, metallic implants) may make CT or myelography necessary.

**Management** Lumbar laminectomy may provide relief of symptoms and recovery of normal exercise tolerance.







# Spinal cord compression

is one of the more common neurological emergencies.

A space-occupying lesion within the spinal canal may damage nerve tissue either directly by pressure or indirectly by interference with blood supply.

Oedema from venous obstruction impairs neuronal function.

ischaemia from arterial obstruction may lead to necrosis of the spinal cord.

The early stages of damage are reversible but severely damaged neurons do not recover.



## 25.79 Causes of spinal cord compression

Site	Frequency	Causes
Vertebral	80%	Trauma (extradural) Intervertebral disc prolapse Metastatic carcinoma (e.g. breast, prostate, bronchus) Myeloma Tuberculosis
Meninges (intradural, extramedullary)	15%	Tumours (e.g. meningioma, neurofibroma, ependymoma, metastasis, lymphoma, leukaemia) Epidural abscess
Spinal cord (intradural, intramedullary)	5%	Tumours (e.g. glioma, ependymoma, metastasis)





## 25.80 Symptoms of spinal cord compression

### Pain

- Localised over the **spine** or in a root distribution, which may be aggravated by coughing, sneezing or straining

### Sensory

- Paraesthesia, numbness or cold sensations, especially in the lower limbs, which spread proximally, often to a level on the trunk

### Motor

- Weakness, heaviness or stiffness of the limbs, most commonly the legs

### Sphincters

- Urgency or hesitancy of micturition, leading eventually to urinary retention

# Spinal cord compression

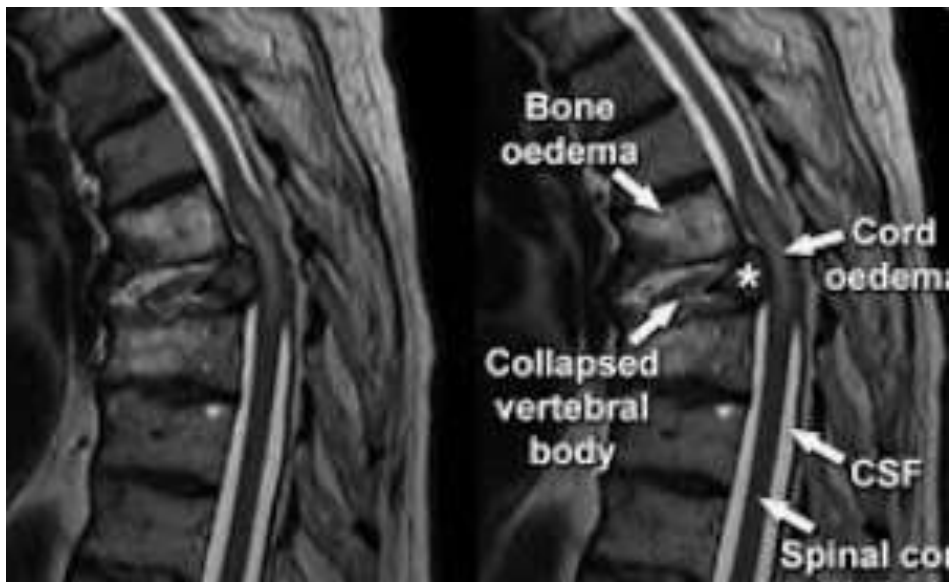
investigation of choice is MRI as it can define the extent of compression and associated soft-tissue abnormality.

Plain X-rays may show bony destruction and soft-tissue abnormalities.

Routine investigations, including chest X-ray, may provide evidence of systemic disease

# Spinal cord compression

Management :Benign good functional recovery can be expected unless a marked neurological deficit has developed before diagnosis.  
management should involve close cooperation with both oncologists and neurosurgeons.



# Block vertebrae

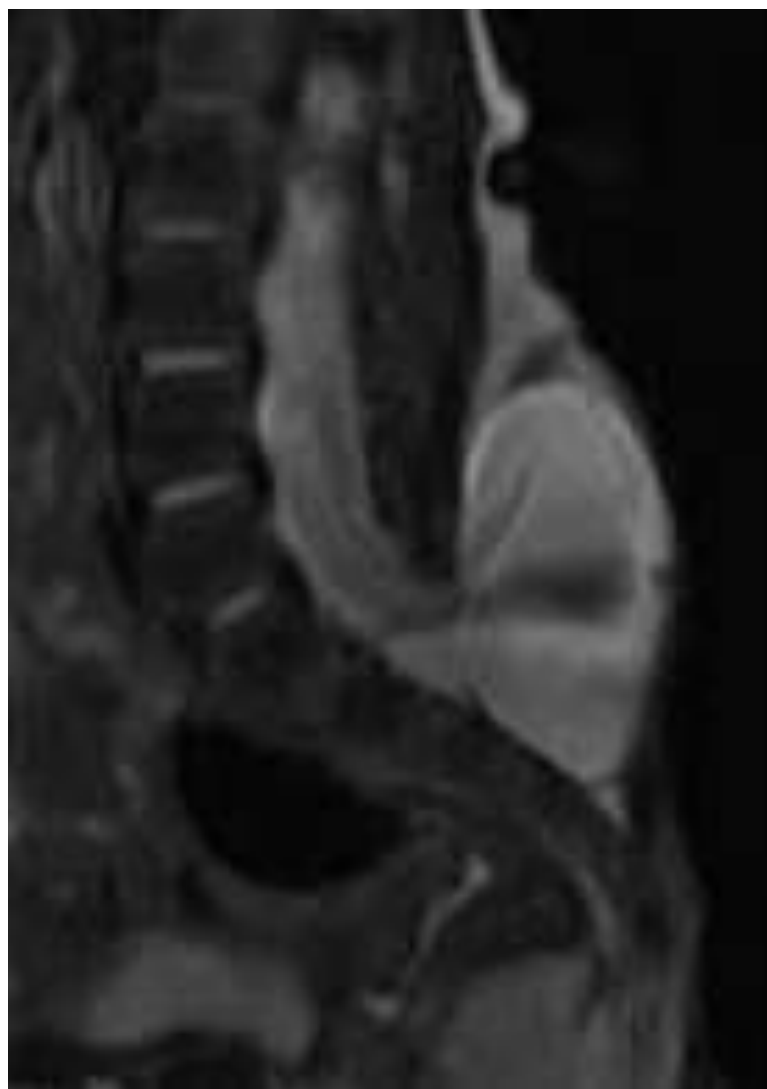
occur when there is improper segmentation of the vertebrae, leading to parts of or the entire vertebrae being fused.



# Spina bifida

is a birth defect in which there is incomplete closing of the spine and the membranes around the spinal cord during early development in pregnancy.





# Kyphosis

is an abnormally excessive convex curvature of the spine as it occurs in the thoracic and sacral regions





# Scoliosis

- is a medical condition in which a person's spine has a sideways curve.
- The curve is usually "S"- or "C"-shaped over three dimensions.
- In some, the degree of curve is stable, while in others, it increases over time.
- Mild scoliosis does not typically cause problems, but more severe cases can affect breathing and movement.
- Pain is usually present in adults, and can worsen with age.



# Osteoporosis

is a systemic skeletal disorder characterized by low bone mass, deterioration of bone tissue leading to bone fragility, and consequent increase in risk of fracture.

It is the most common reason for a broken bone among the elderly



# Ankylosing spondylitis (AS)

is a type of arthritis in which there is a long-term inflammation of the joints of the spine, Back pain is a characteristic symptom of AS, and it often comes and goes. Stiffness of the affected joints generally worsens over time.



# **Vertebral compression fractures**

occur when the vertebral body in the spine collapses, which can lead to severe pain, deformity and loss of height. These fractures more commonly occur in the thoracic spine ,especially in the lower part.

- Causes includes:-
  1. Osteoporosis as in old ages,
  2. Osteomalasia as in anorexia nervosa and dietary deficiency of vit D and calcium.
  3. Metastasis . should be considered as the cause in patients younger than 55 with no history of trauma or only minimal trauma. The bones of the spine are a common place for many types of cancers to spread. The cancer may cause destruction of part of the vertebra, weakening the bone until it collapses.