

Spinal Infections

Dr. Ahmed Saleh

I. Pyogenic infection

Aetiology

- **Causative organism:**
 - *Staph. aureus* (most common)
- **Route of infection:**
 - Haematogenous (most common)
 - Iatrogenic during surgery
 - local spread from nearby structures.
- **Predisposing factors:**
 - Depressed immunity due to chronic diseases (diabetes mellitus, Chronic renal failure or liver cirrhosis) or HIV infection.
 - Genitourinary infection is the most common predisposing factor for blood-borne infection.

Pathology

- Blood-borne infection usually starts in the end plate causing suppurative inflammation, tissue necrosis, bony collapse, and spread of the infection into the adjacent intervertebral disc spaces.
- The infection can extend anteriorly to create a paravertebral abscess or posteriorly to cause an epidural abscess.
- Neurological deficits are caused by (1) direct extension of the infection or (2) compression from pathological fracture.

Clinical Picture

- **Symptoms:**

- **Pain (most common)**
- Constitutional symptoms: anorexia, malaise, night sweats, intermittent fever, and weight loss.
- Kyphosis (late)
- Paralysis (Late)

- **Signs:**

- Localized tenderness
 - Paraspinal muscle spasm and limitation of motion.
 - Psoas abscess
 - Neurological manifestations: the higher the level, the more the manifestations.
- NB1: Clinical findings in elderly and immunosuppressed individuals may be minimal.
 - NB2: Differentiation between pyogenic and caseating infections by physical examination is difficult.

Investigations (Culture is the surest)

- A: Radiological:

- X ray

1. Disc space narrowing,
2. Vertebral end plat irregularity
3. Subchondral bone defects and hypertrophic (sclerotic) bone formation.
4. Paravertebral soft-tissue masses.
5. Vertebral collapse, kyphosis, and bony ankylosis (late).

- CT

- MRI

- Early and accurate.
 - Low T1 & high T2

- **B: Laboratory:**

- ↑ ESR (good prognostic)
- ↑ CRP (good diagnostic)
- ↑ WBCs (not a god diagnostic tool as may decrease in infants and debilitated patients)
- Blood culture (may be)

- **C: Biopsy:**

- Needle or open

D.D

1. Malignancy (1ry or 2ry)
2. infections in nearby structures (psoas muscle, hip joint or abdominal cavity).
3. Pott's disease

Treatment

- **Nonoperative:**
 - Bed rest and immobilization (cast or brace)
 - Antibiotics (IV for 6 weeks, followed by oral antibiotics till ESR returns to normal), empirical and according to culture and sensitivity.
- **Operative:**
- **Indications:**
 - Failure of conservative treatment
 - Neurological deterioration
 - Excessive bone damage
 - Epidural or big paravertebral abscess
- **Methods**
 - Debridement and fusion (Anterior, posterior or combined)

II. Pott's disease (TB of spine)

- **Incidence**

- Bone and joint infections = 2% - 3% of all reported cases of TB.
- Pott's disease = 50% of the bone and joint infections.
- The thoracolumbar spine is the most commonly infected area.

Aetiology

- **Causative organism:**
 - *Acid fast mycobacterium.*
- **Route of infection:**
 - Haematogenous (2ry TB)
- **Predisposing factors:**
 - Depressed immunity due to chronic diseases (diabetes mellitus, Chronic renal failure or liver cirrhosis) or HIV infection.

Pathology

- The infection is characterized by acid fast–positive, caseating granulomas .
- Tubercles composed of monocytes and epithelioid cells, forming minute masses with central caseation in the presencen of **Langerhans giant cells**, are typical on microscopic examination..
- **Bone destruction without new bone formation**
 - Formation of tuberculous granulation tissue
 - No new bone formation due to end arteritis obliterans
- **Cold abscess and sinus formation**
- **Activity and healing**
 - Activity \Rightarrow caseation and cold abscess formation (infiltrating tuberculosis)
 - Healing \Rightarrow fibrosis with dystrophic calcification for the central caseous mass (encysted tuberculosis) ... unsafe

Clinical Picture

- **Slowly progressive constitutional symptoms** are predominant in the early stages of the disease, including weakness, malaise, night sweats, fever, and weight loss.
- vertebral collapse, called “concertina collapse” because of its resemblance to an accordion, leading to kyphosis (late) .
- Cervical involvement can cause hoarseness because of recurrent laryngeal nerve paralysis, dysphagia, and respiratory stridor (known as *Millar asthma*).
- **Pott’s Paraplegia:**
 - Group A (paraplegia with active disease):
 1. external pressure on the cord
 2. penetration of the dura by infection
 - Group B (paraplegia of healed disease):
 1. transection of the cord by a bony ridge
 2. constriction of the cord by granulation and fibrous tissue

Investigations (Culture is the surest)

- A: Radiological:

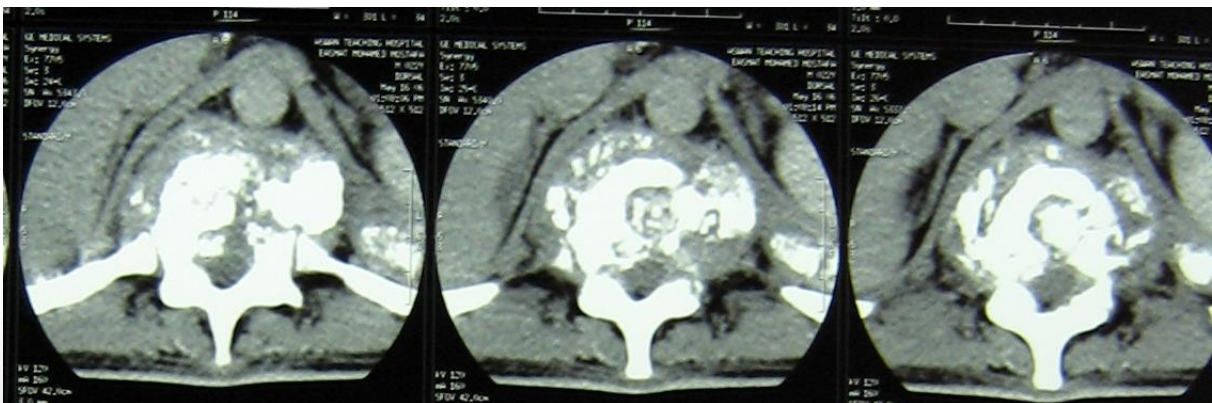
- X ray

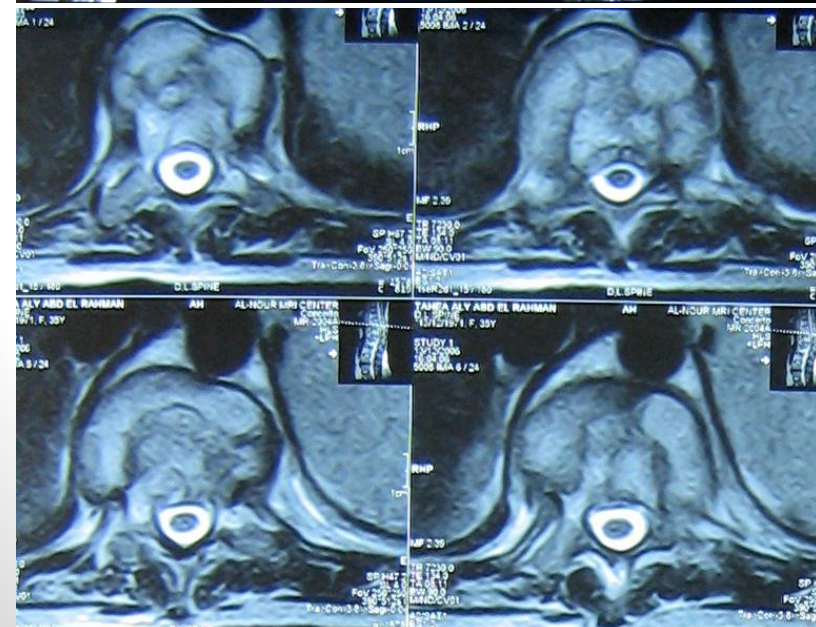
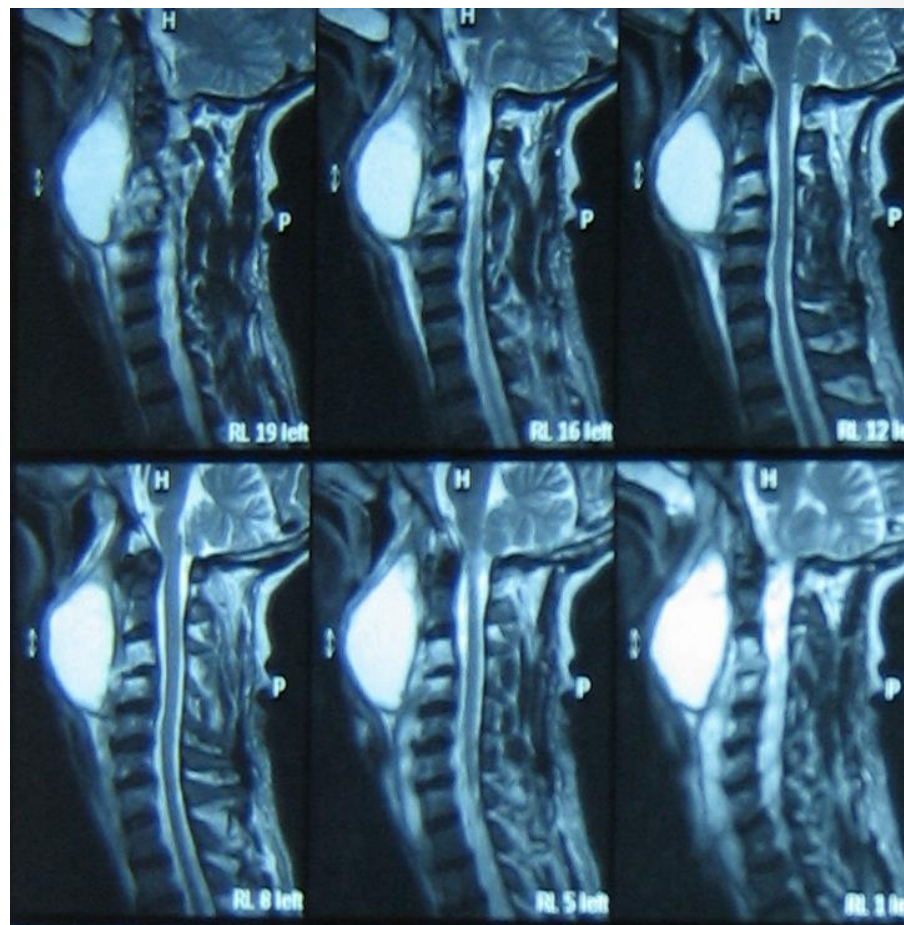
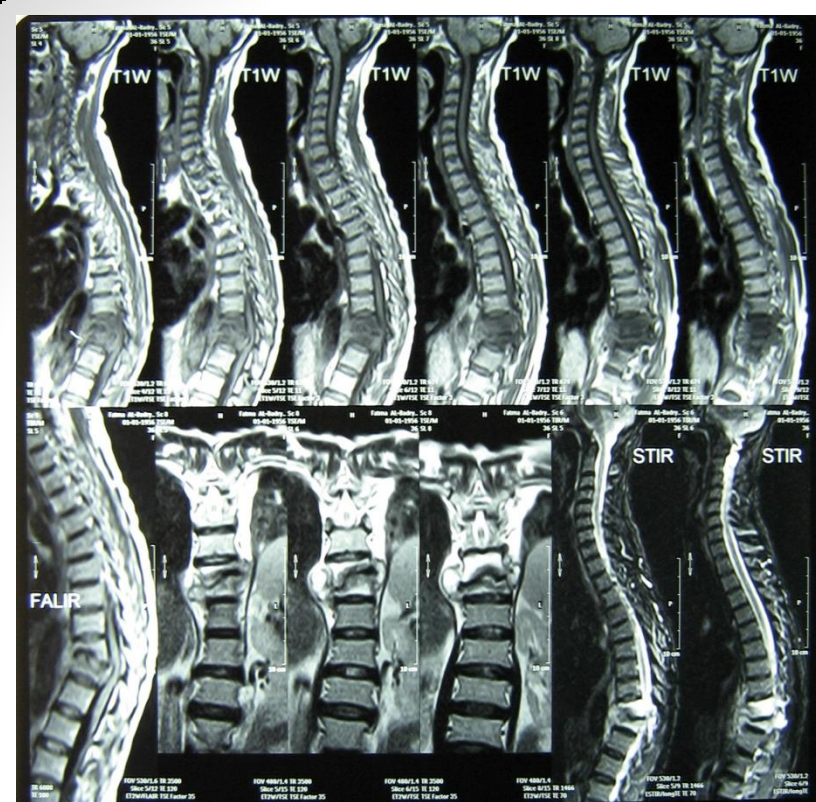
- Affection of 2 or more adjacent vertebrae with intervertebral disc.
 - No bony sclerosis or new bone formation
 - Paravertebral soft-tissue masse
 - Vertebral collapse (late).

- CT: characteristic calcification

- MRI

- Low T1 & high T2





- **B: Laboratory:**

- Anaemia and hypoproteinemia (chronic illness)
- ↑ ESR
- +ve Tuberculin test

- **C: Biopsy:**

- Needle or open

D.D

1. Malignancy (1ry or 2ry)
2. pyogenic and fungal infections

Treatment

- **Nonoperative:**
 - Bed rest and immobilization (cast or brace) and correction of the general condition.
 - Antituberculous TTT
- NB: Definitive diagnosis by culture is important because of the toxicity of the chemotherapeutic agents and the length of treatment required.
- **Operative:**
- **Indications:**
 - Failure of conservative treatment
 - Neurological deterioration
 - Excessive bone damage
 - Epidural or big paravertebral abscess
- **Methods**
 - Debridement and fusion (Anterior, posterior or combined)

Low Back Pain

Incidence

- Affects up to 85% of adults
- Leading cause of disability (ages 19-45y)
- **Risk factors**
 - Smoking
 - Obesity
 - Older age
 - Strenuous or sedentary work
 - Psychological factors (anxiety, depression, etc)

Course

- By 6 weeks
 - 65% of patients have recovered
- By 12 weeks
 - 85% of patients are improved
- **After 12 weeks**
 - **Recovery is less likely**

Causes

- **Trauma**
 - Disc herniation
 - Strains (of muscle) & Sprains (ligaments)
 - Fractures
- **Tumor** (vertebrae or spinal cord)
- **Inflammation** (Spondylodiscitis & Rheumtoid arthritis)
- **Instability** (Spodylolysis & Spondylolethesis)
- **Degenerative disorders** (Spondylosis)
- **Other causes outside the spine**
 - Sacroiliac joint dysfunction
 - Nerve injury (sciatic n. or nerve root)
 - Hip joint affection & pelvic or abdominal mass
 - Gynecological (adhesions, fibroids, endometriosis)

C/P

- **History**

- Evidence of systemic disease
- Evidence of neurologic compromise
- Social or psychological issues
- Risk factors
- Mechanism of injury
- Red flags (neoplasms, cauda equina)

- **Symptoms**

- Low back Pain & muscle spasm
- Hip, buttock, or groin pain
- Sciatica
- Neurogenic claudication, motor and sensory disturbance

C/P

- **Signs**

- Tenderness
- Limited range of motion
- +ve straight leg raising test
- Neurological exam
- Evaluation for malignancy
- Psychological assessment

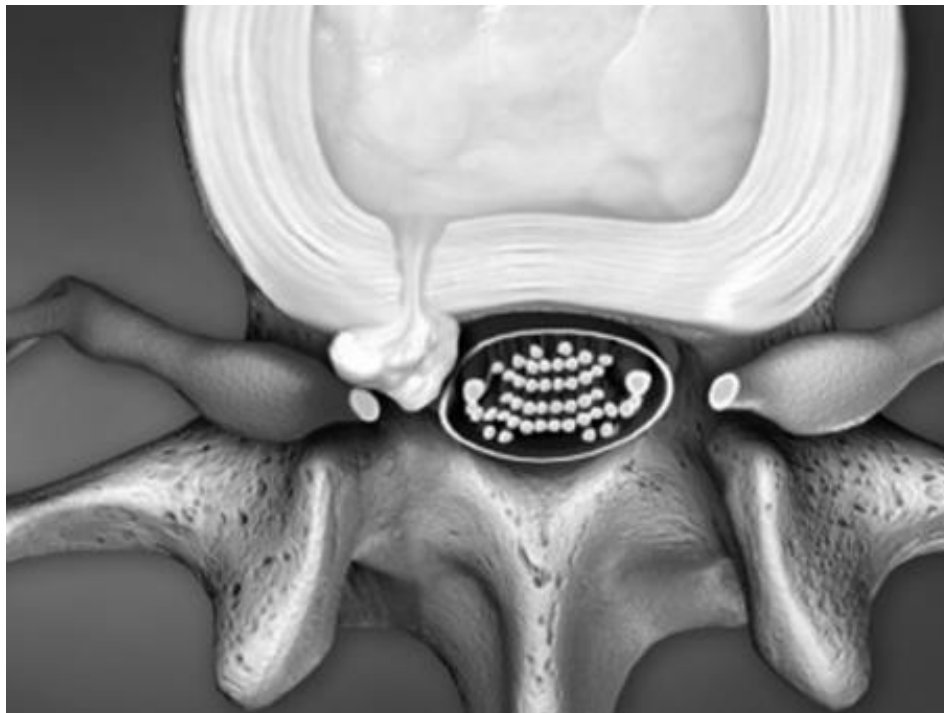
- **Investigations**

- X-rays
- CT
- MRI
- EMG/NCS
- Discography



Herniated Disc

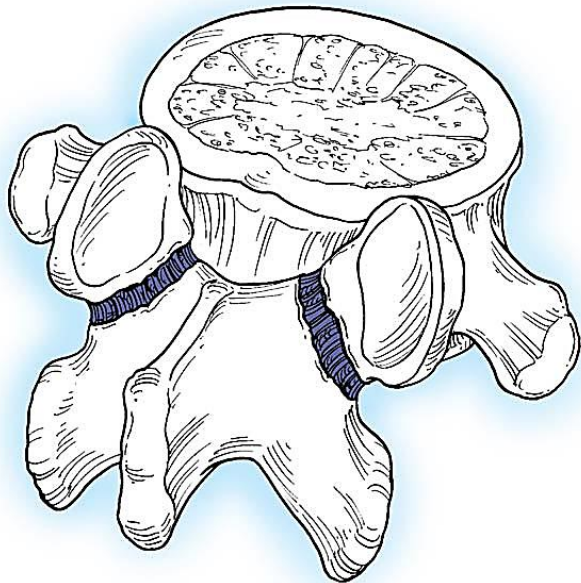
- Sciatica
- Back pain and muscle spasm
- Neurological manifestations



Spondylolysis & Spondylolesthesis

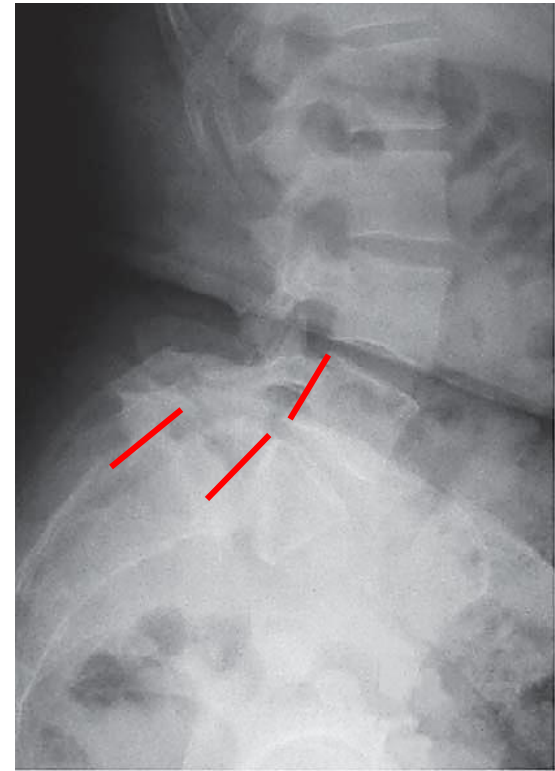
- **Spondylolysis**

- Defect in the pars interarticularis



- **Spondylolesthesis**

- Anterior vertebral slippage
- Mostly due to pars defect



Spondylosis (degenerative disc disease)

- Symptoms are centrally located
- May involve buttock or proximal leg pain
- Exacerbated by obesity and inactivity
- Spinal canal stenosis leading to neurogenic claudications



Treatment

- **Medications**
 - NSAIDs and other analgesics
 - Muscle relaxants
 - Neurotonics
- **Physiotherapy**
- **Injections**
 - Trigger point ,epidural or facet injections
- **Other methods**
 - Radiofrequency ablation
 - Spinal cord stimulation
- **Surgical Treatment**
 - Discectomy
 - Fusion
 - Fracture stabilization

Summary

- Back pain is the 2nd most common reason for medical visits.
- Focused history and examination
- Variety of causes for low back pain
- Physician must identify and treat the cause
- **Conservative treatment**
- Surgery is the last option

Thank You