

# Tuberculosis of bone and joints



Tuberculosis, depicted by Greek statue found at Soissons. Major, Hippocrates and the Isle of Cos, 16

FIGURE 17. HECUBA

Le Colosse de Nîmes, 17. 18. 19. 20. 21. 22.

# General considerations

- Osseous T.B. occur in 1 – 8%
- 30 – 50% of osseous involvement occur in vertebrae (Pott's disease)
- Frequently, a primary extraosseous lesion can't be found

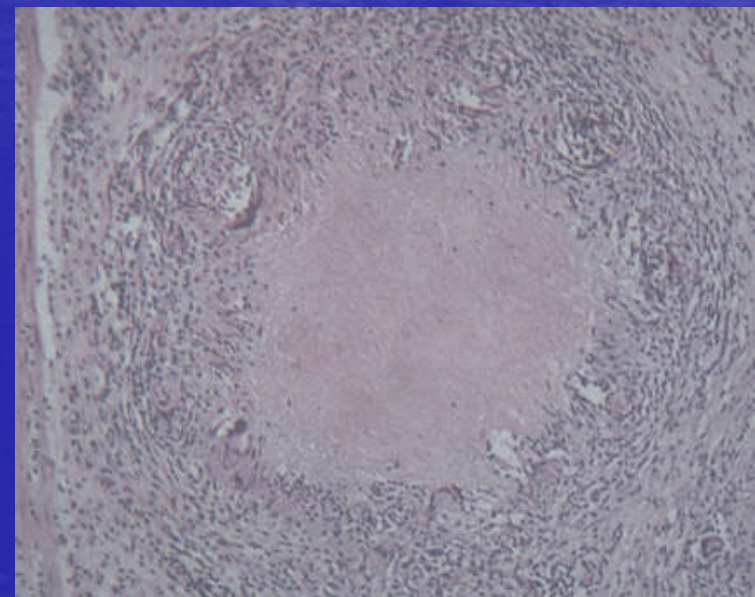
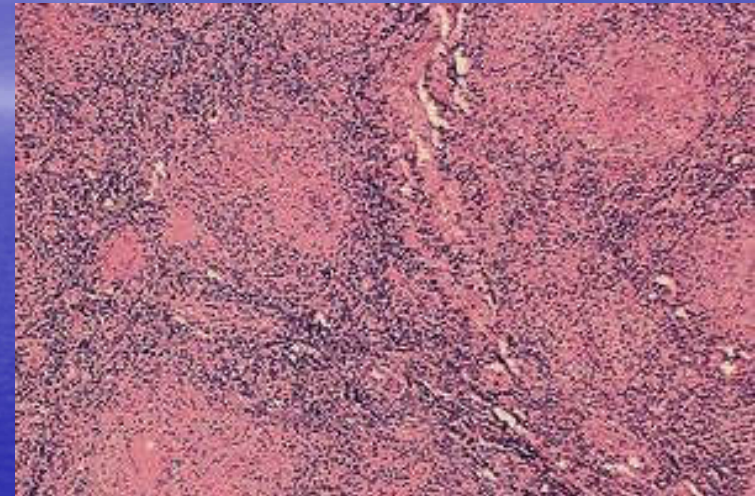


- Tuberculosis is transmitted primarily through inhalation or ingestion of *Mycobacterium tuberculosis* or *M. bovis*
- *Spread*
  - *Lymphogenous*
  - *Hematogenous*
  - *Contiguous extension to other tissues and organ systems*



# Pathology

- Reproduces its general pathology by forming **tuberculous granuloma**
- **Central caseation** occur due to either
  - Hypersensitivity reaction to tuberculin
  - Ischemia
- **Growth of the tubercle bacilli** occurs by influx of new mononuclear cells which mature into epithelioid cells



# Tuberculous osteomyelitis



# Pathology

- 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
  - The sinus is lined by tuberculous granulation tissue
- 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**

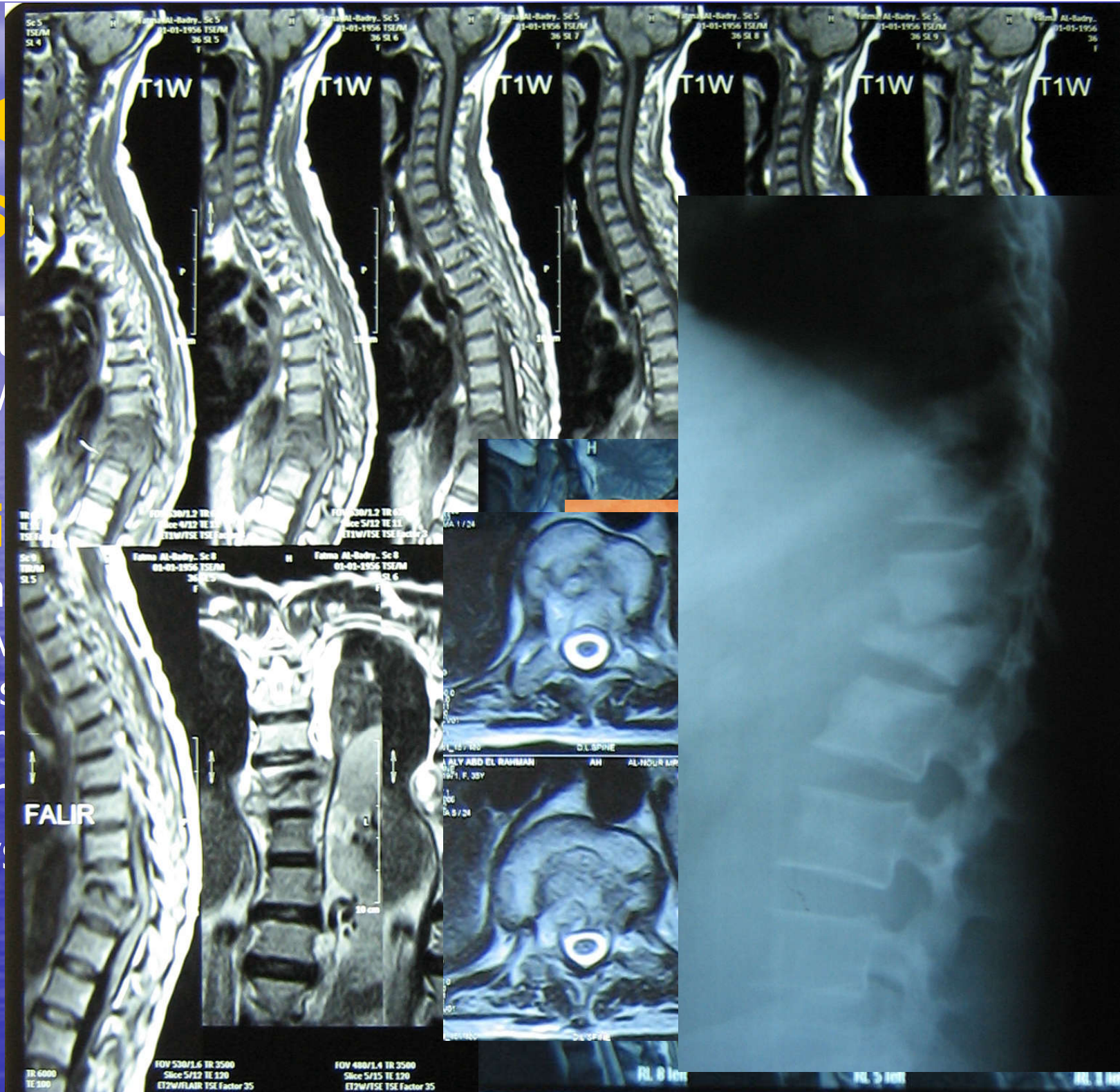
# Special sites

- **Tuberculosis of spine (Pott's disease)**
- **Tuberculosis of long bones**
- **Tuberculosis of flat bones**
- **Tuberculous dactylitis or spina ventosa**



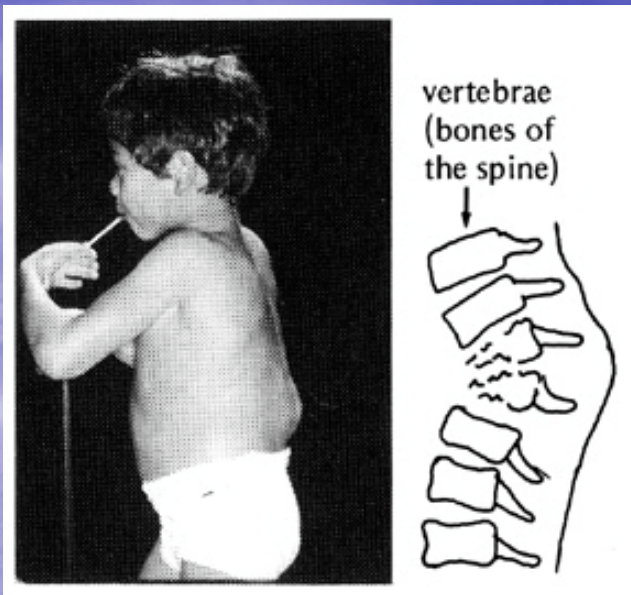
# Tuberculous diseases

- Affects the vertebral bodies with disc spaces
- Complications
  - Cold abscess
  - Cervical spondylitis
  - Dorsal spondylitis
  - Lumbar spondylitis
  - Deformity
  - Paralysis
  - sinus





# Pott's Disease





**Tuberculosis of the spine in an Egyptian mummy**



# Clinical presentation:

1. Back pain
2. Fever
3. Night sweating
4. Anorexia
5. Weight loss
6. Spinal mass, sometimes associated with numbness, paraesthesia or muscle weakness of the legs

# Diagnosis

- **Clinically**

- Pain & Local tenderness
- Stiffness and limitation of motion of spine
- Deformity
- Cold abscess
- Paraplegia

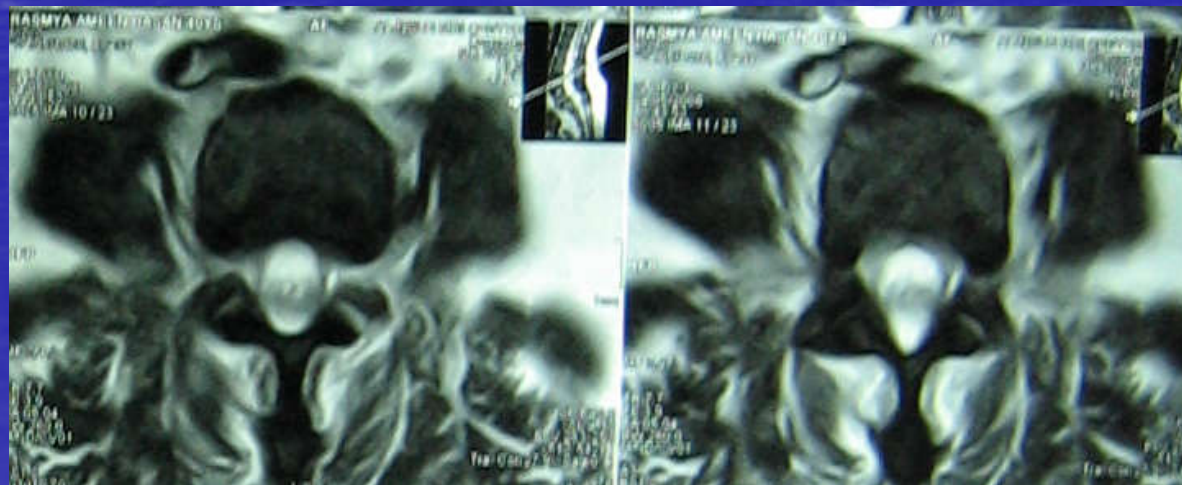
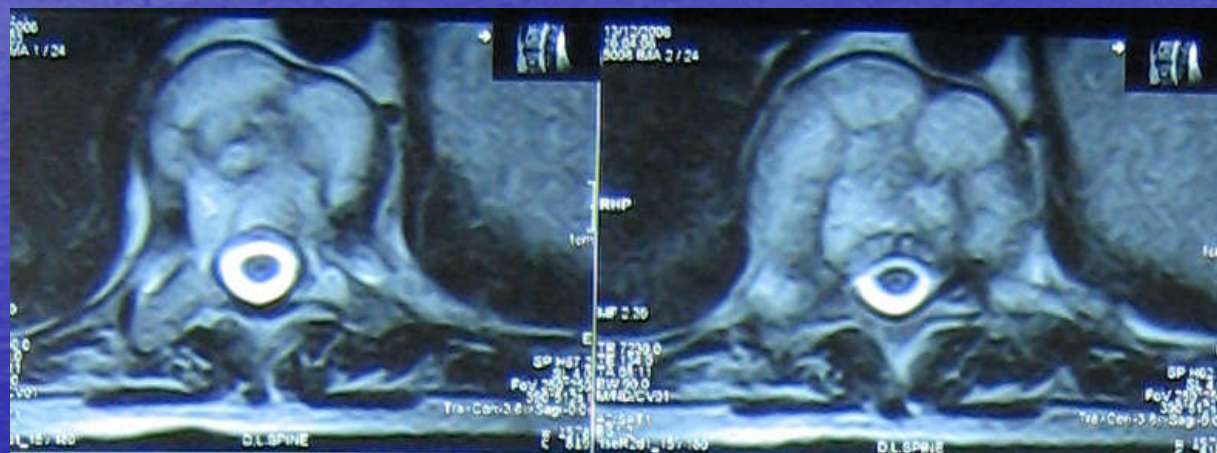
- **Radiographs**

- Plain radiographs
  - Two or more adjacent vertebrae are affected with intervertebral disc destroyed
  - No bony sclerosis or new bone formation
  - Paravertebral abscess shadow
- C.T. ... characteristic calcification
- MRI ... define extent if infectious process in the soft tissue

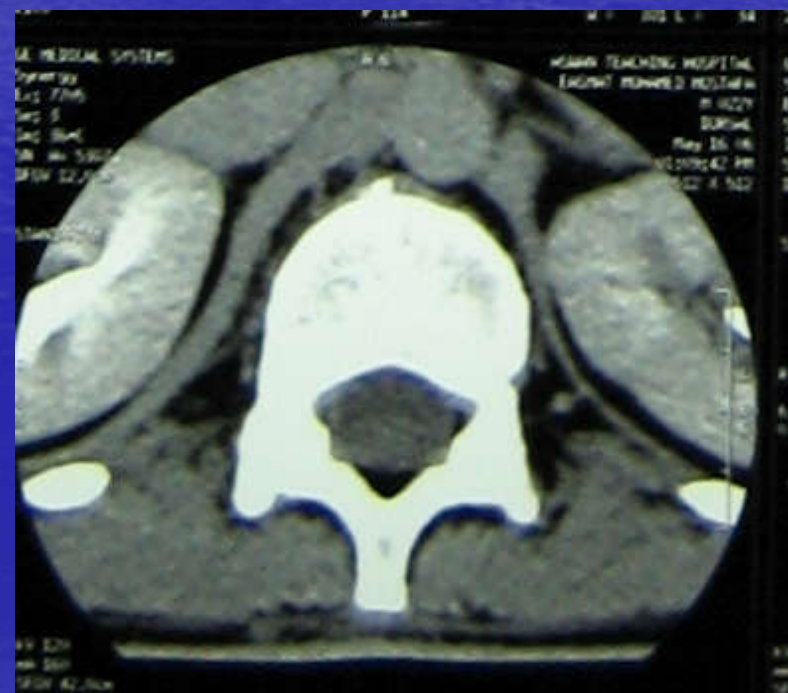
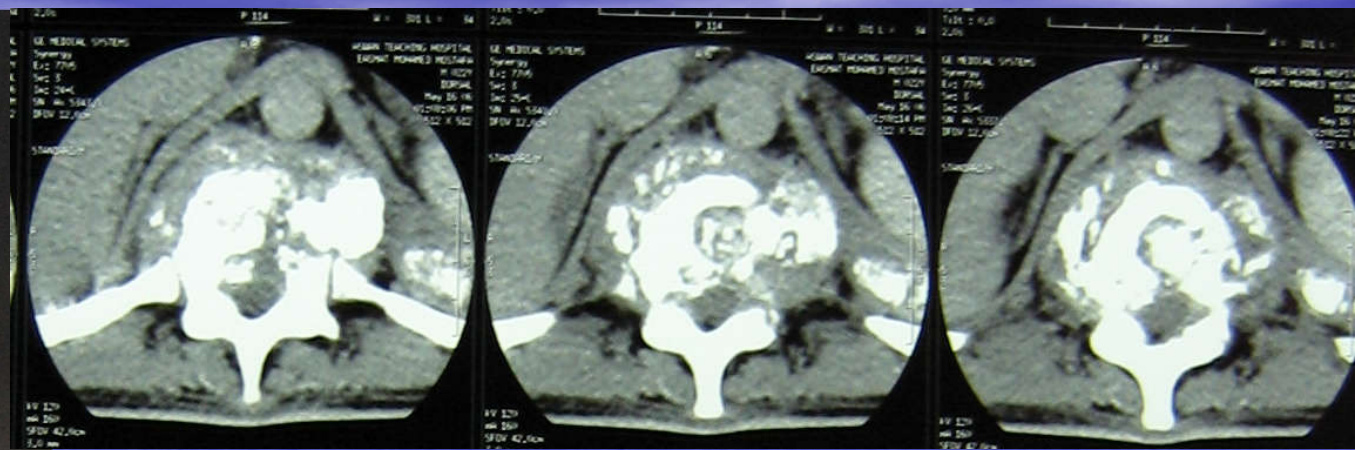
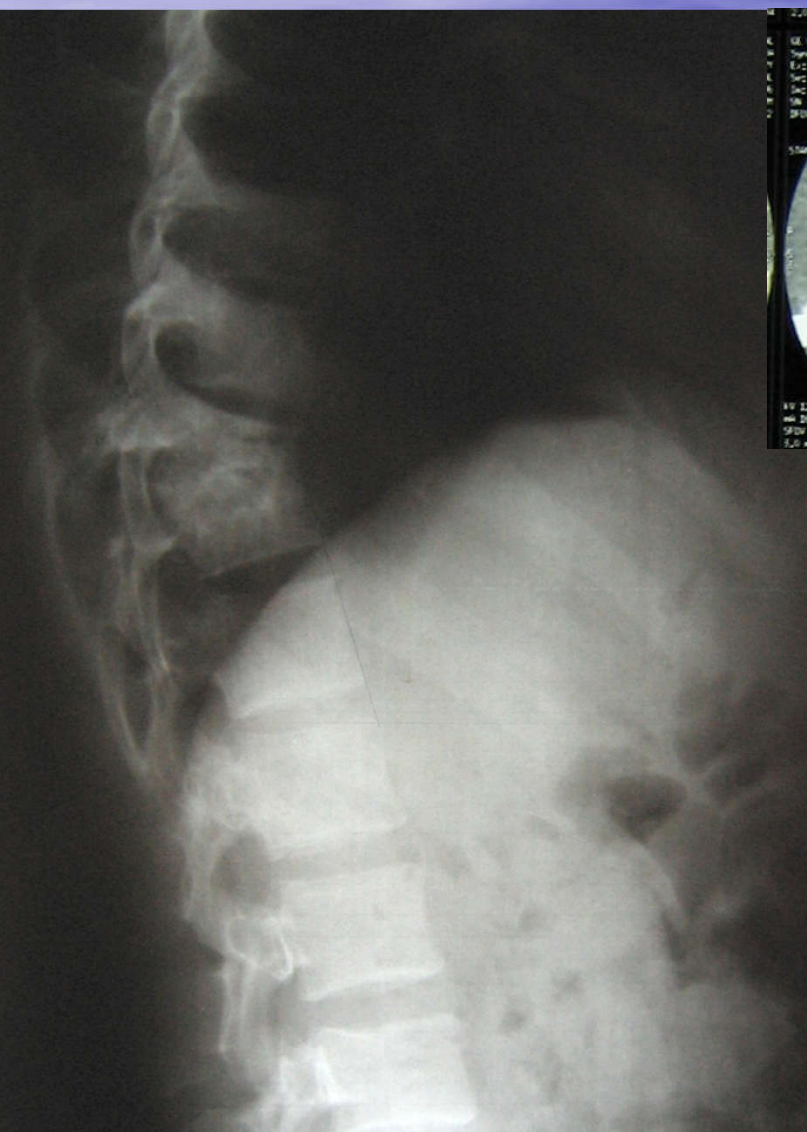
- **Biopsy and culture**

- Percutaneous techniques... radiographic or C.T. guided
- Open biopsy















# Treatment

- **General**

- Nutrition
- Antituberculous drugs

- **Local measures**

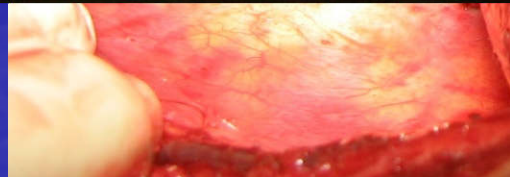
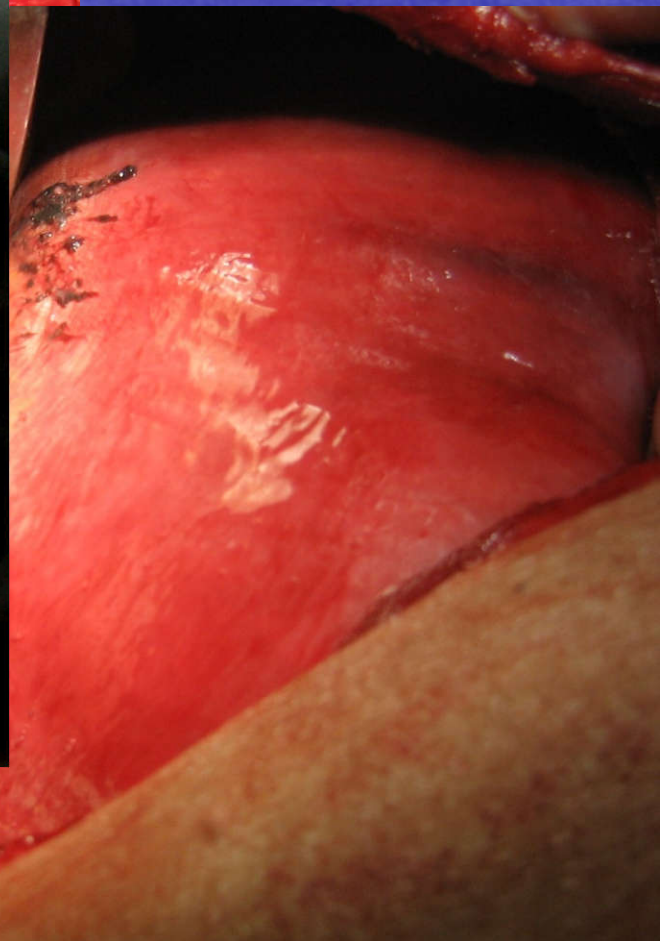
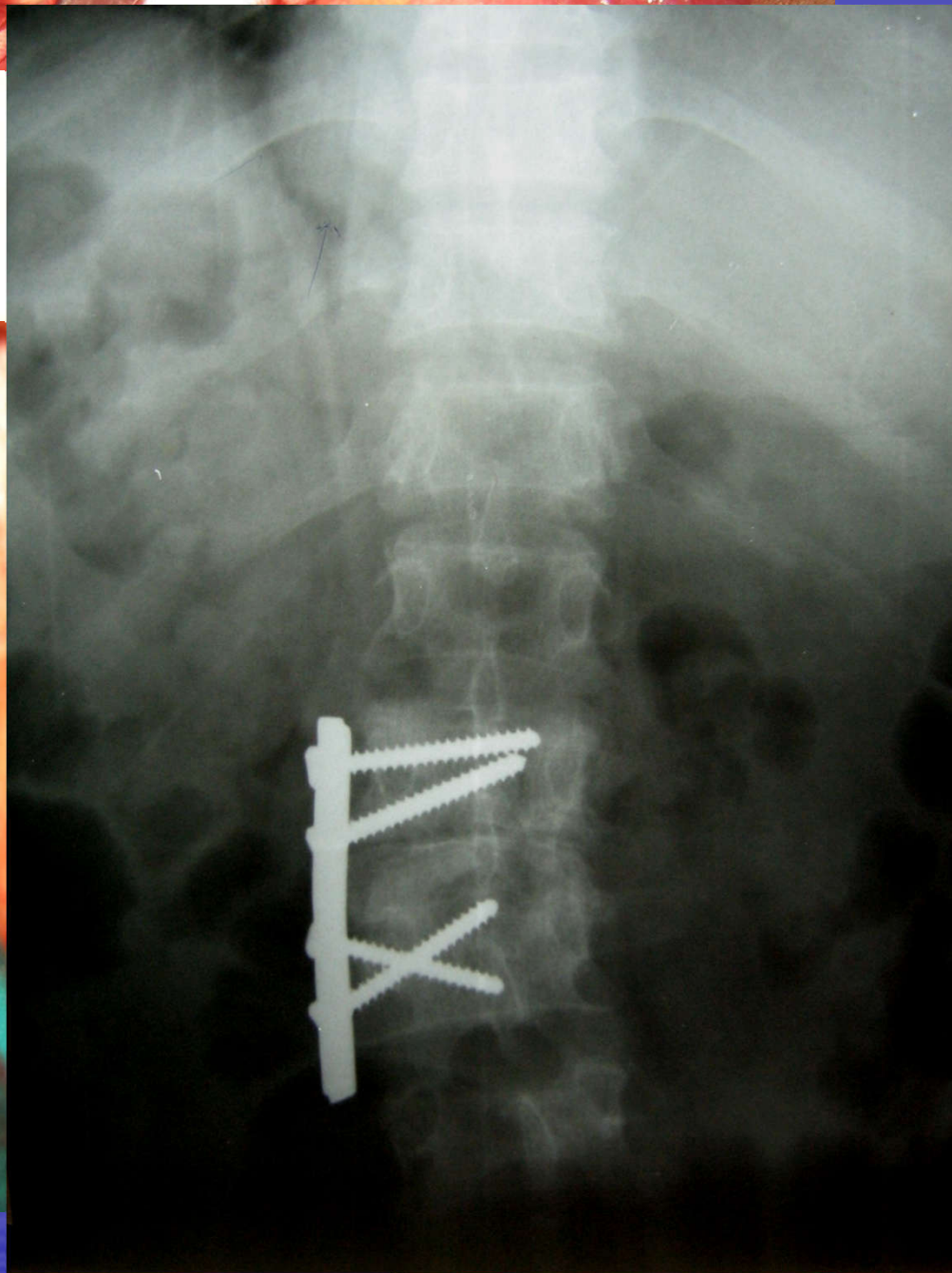
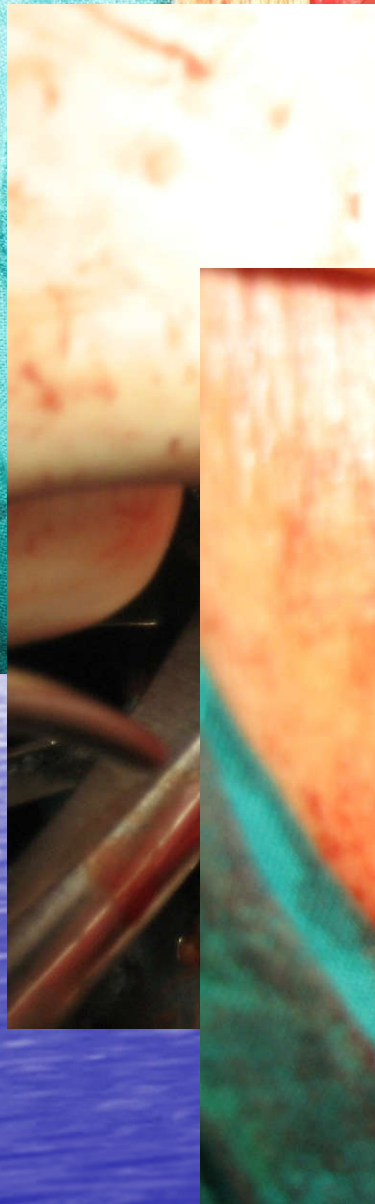
- In active stage ... rest with plaster jacket
- In quiescent stage ... ambulation with support of spine
- In convalescent stage ... removable jacket is used

- **Surgical treatment :**

Nowadays is the treatment of choice.

Evacuation of the cold abscess ,debridment ,Graft and IF.





# Tuberculosis of long bones

- Infection may start in epiphysis or metaphysis
- Unlike pyogenic osteomyelitis ... tuberculosis can destroy physal plate and spread to adjacent joints



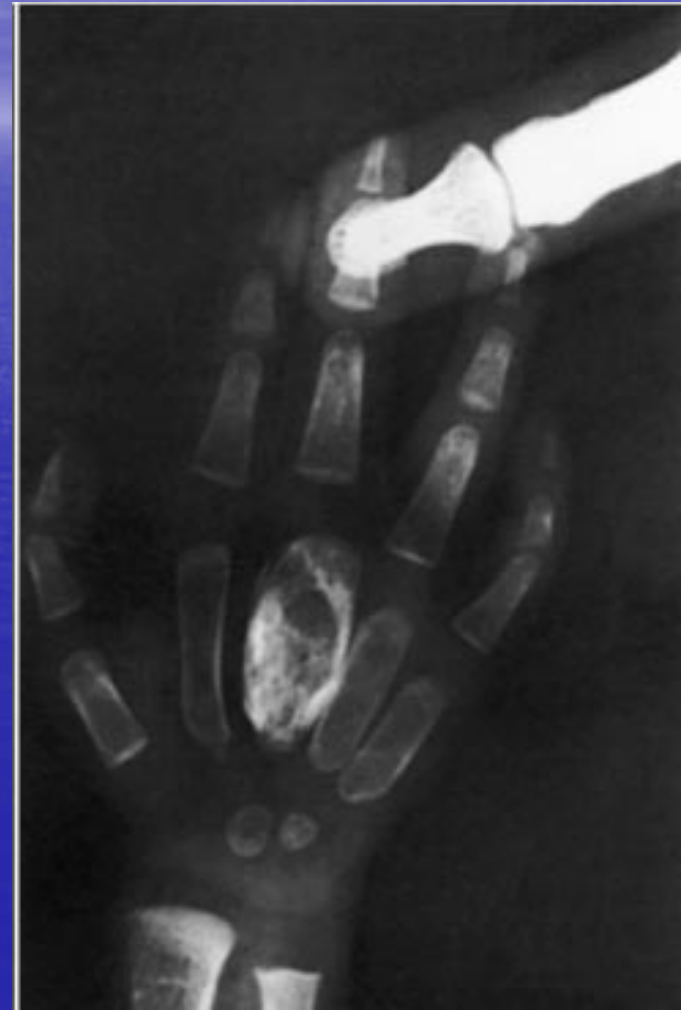


# Tuberculosis of flat bones

- Ribs, sternum and scapula
- Usually tuberculous periosteitis with erosion of the surface of the bone and abscess formation

# Tuberculous dactylitis or spina ventosa

- Phalanges, metacarpals and metatarsals
- Central diaphyseal destruction with elevated periosteum which forms a shell of new bone formation ... fusiform appearance (spina ventosa)





# Treatment

- **General measures**
  - Good nutrition
  - Anti-T.B. treatment
- **Local measures**
  - Rest and splintage
- **Operative treatment**
  - Bony lesion
    - Curettage
    - Excision of affected bone ... rib
  - Treatment of complication
    - Abscess
    - Sinus
    - Deformity
  - Amputation



# Tuberculous arthritis



# Pathology

- **Joints commonly affected**
  - Hip, knee, ankle, shoulder, elbow, wrist, sacroiliac joints
- **Site of initial lesion**
  - Synovial
    - Usually in children and in the knee
    - Chronic synovitis ... prognosis for joint mobility is good
  - Osseous
    - Bony focus opening into the joint

# Local changes

- **Synovial lesion**

- Synovial membrane is thickened and studded with tubercles
- Fibrosis on the outer surface of the synovial membrane
- Effusion with rice bodies (fibrin around small pieces of articular cartilage)
- The thickened synovial membrane creeps over the articular cartilage causing damage (pannus)

- **Osseous lesion**

- Bony focus will cause destruction of articular cartilage by the tuberculous granulation tissue in the subchondral bone
- Osteoporosis and destruction of the articular bone without reactive new bone formation

- **The capsule and ligaments**

- are softened, oedematous and thickened

- **Muscles**

- around the joint undergo marked atrophy to an extent that can't be simply explained by the disease



# Complications

- Cold abscess and sinus formation
- Pathological dislocation
- Dissemination

# Diagnosis

- **Clinically**

- Generally ... tuberculous toxemia
- Locally
  - Symptoms
    - Pain
    - Swelling ... synovial and periarticular thickening, effusion and cold abscess
    - Impairment of function of the joint
    - Night cries
    - Limbing
  - Signs
    - Deformity, swelling, muscle wasting
    - Joint is warm and discomfort
    - Motion is limited

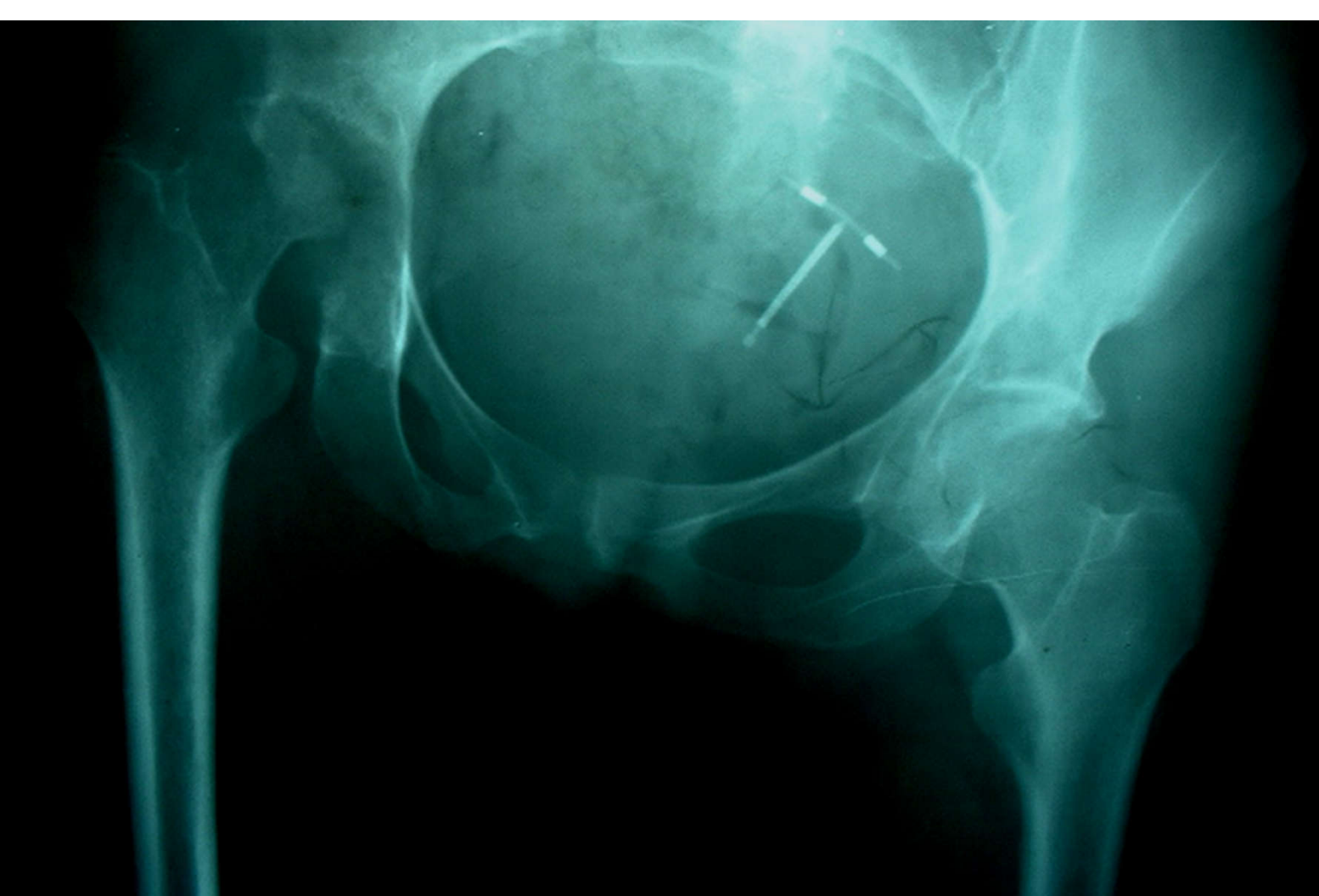


- **Radiographs**

- Decreased joint space
- Juxta-articular osteoporosis
- Bone destruction without new bone formation

- **Lab**

- ESR, CBC
- Recognition of the organism
- PCR
- Biopsy
  - LN
  - Synovial membrane







# Treatment

- **General measures**
  - Good nutrition
  - Anti-T.B. treatment
- **Local measures**
  - Rest and splintage
- **Operative treatment**
  - Joint
    - Synovectomy
    - Clearance operation
  - Arthrodesis
  - Treatment of complication
    - Abscess
    - Sinus
    - Deformity





THANK YOU