

# Infections of the Spine

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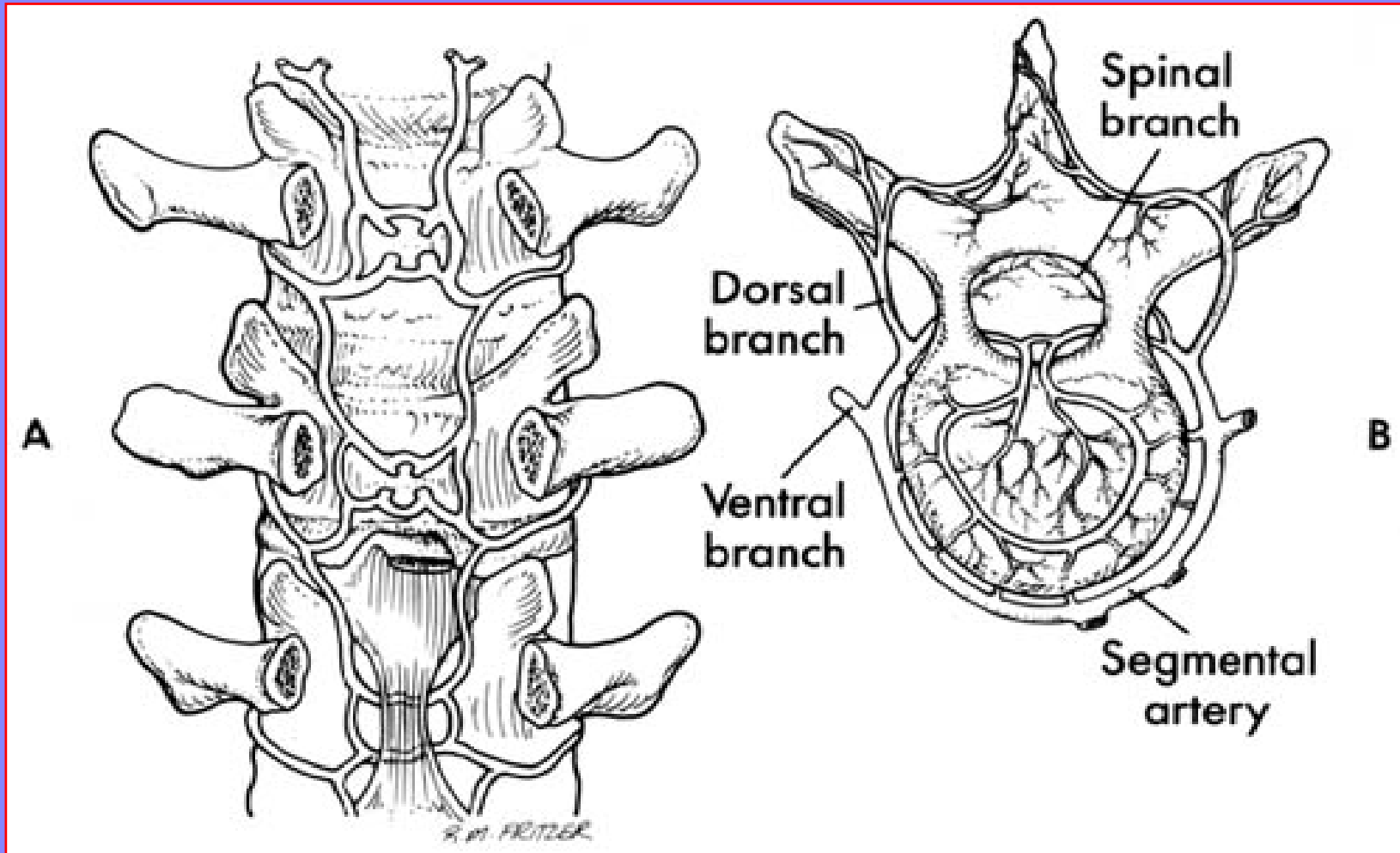
**Professor of Orthopedics**

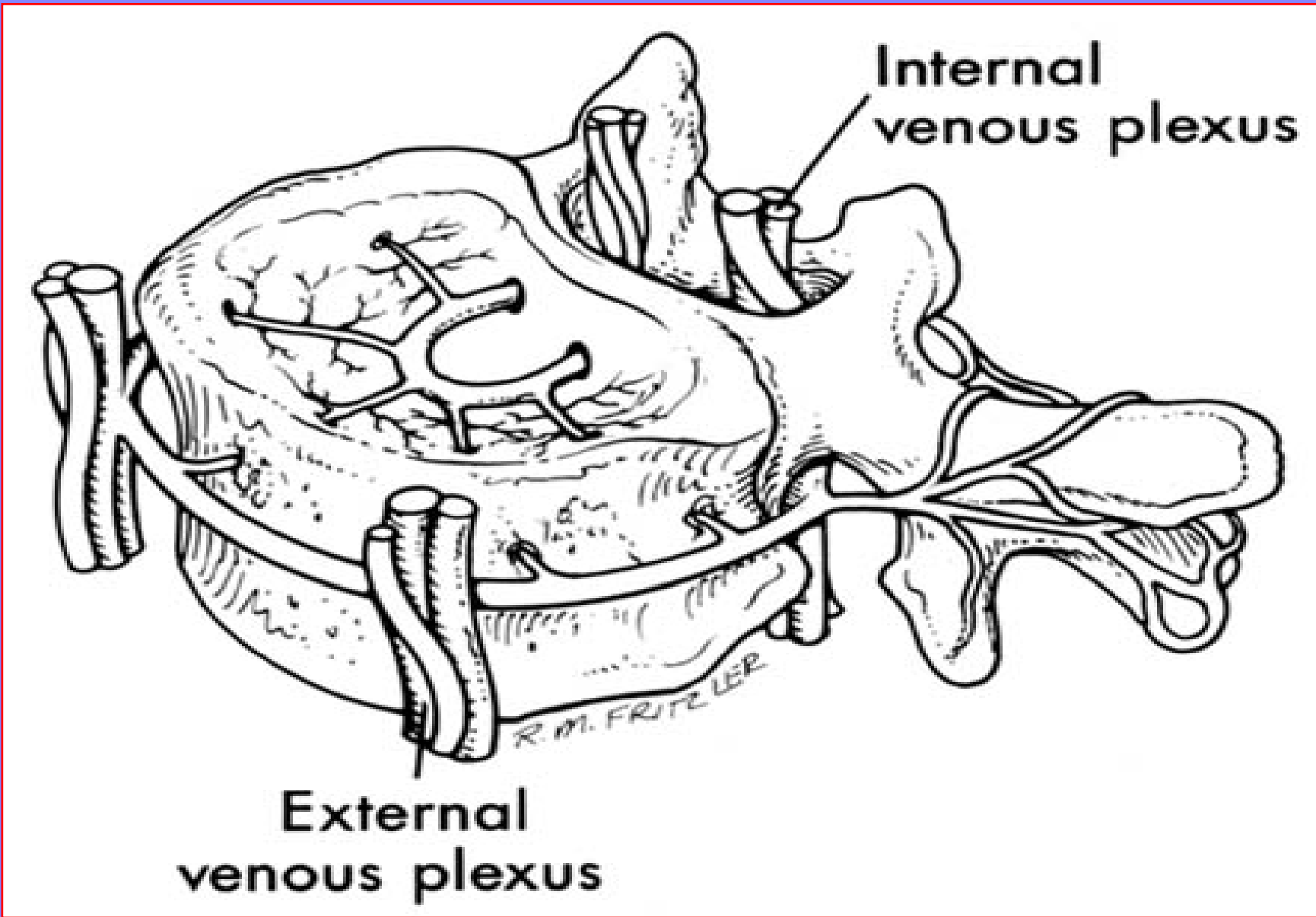
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# **VERTEBRAL OSTEOMYELITIS**

**Hematogenous spread :**  
**Endarteriolar circulation at the vertebral endplates is an area predisposed to hematogenous seeding.**

**in the lumbar spine followed by the thoracic spine.**





- 1-Paraspinal abscess**
- 2-Extraspinal abscesses.**

**Paralumbar abscesses may point in the**

- A- Flank at Petit's triangle,**
- B- Groin,**
- C-Buttock,**
- D- Popliteal fossa,**
- E-Perirectal area.**

# Predisposing factors

- 1- **Septic focus** (e.g skin, genitourinary).
- 2- **Invasive procedures.**
- 3- Patients with **spinal cord injury** ,  
due to chronic UTI and skin ulcers.
- 4- **immunocompromised** .
- 5- **Penetrating** trauma, spinal surgery,
- 6- **Diabetes**, Rh.A, steroid use, old age,

# The bacteriology of vertebral osteomyelitis

**A- S. aureus. 50% .**

**B- Gram-negative Escherichia coli and Pseudomonas and Proteus species.**

**C-Anaerobic organisms.**

# Laboratory studies

- 1-(ESR) and (CRP) high in 90% of patients.
- 2- Needle biopsies guided by (CT) or fluoroscopy.  
Cultures are positive in 68% to 86% of cases.  
When negative
- 3- Open biopsy, positive in greater than 80% of cases.

samples sent for pathology to exclude  
Malignancy, Stains for AFB, fungal organisms,  
and pyogens.



# Imaging

## 1-Plain radiographs

The findings lag 2 to 3 weeks behind the onset of symptoms.

- A- Osteolysis in the ant. vertebral metaphyseal region,
- B- Loss of disk space height,
- C- End plate blurring,
- D- Subchondral reactive bone formation .



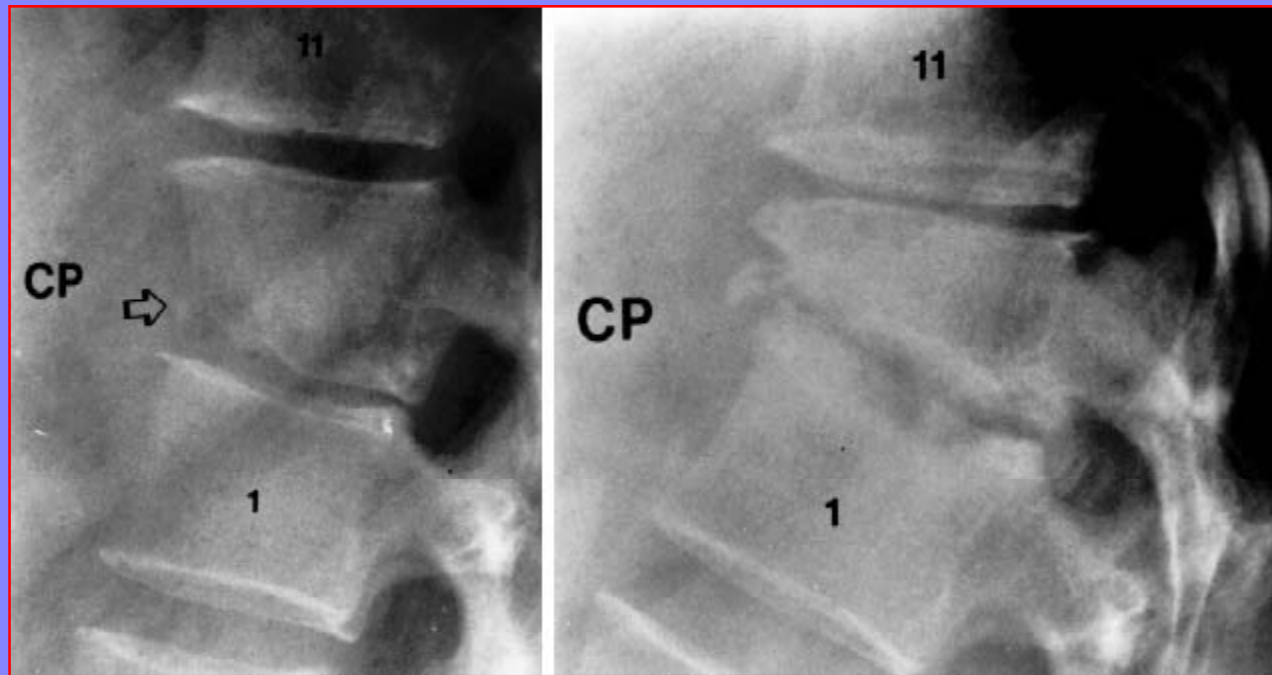
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# Long-standing disease causes

Vertebral destruction,  
→ collapse, kyphosis, and abscess formation



## **2- Technetium bone scan**

**86% in diagnosing vertebral osteomyelitis.**

## **3- CT scans**

**Enhanced CT scans provide a useful view of the spinal canal, identifying areas of local neurologic compromise.**

**4-MR is the imaging 95%**  
(modality of choice for spinal infections)

**T1→ loss of details of the nucleus pulposus, the vertebral end plates, and the associated metaphyseal region.**

**T2→ hyperintensity of the disk space and possibly associated epidural abscesses.**



T12-L1 disk space and the entire L1 body have decreased signal and the end plates are indistinct.

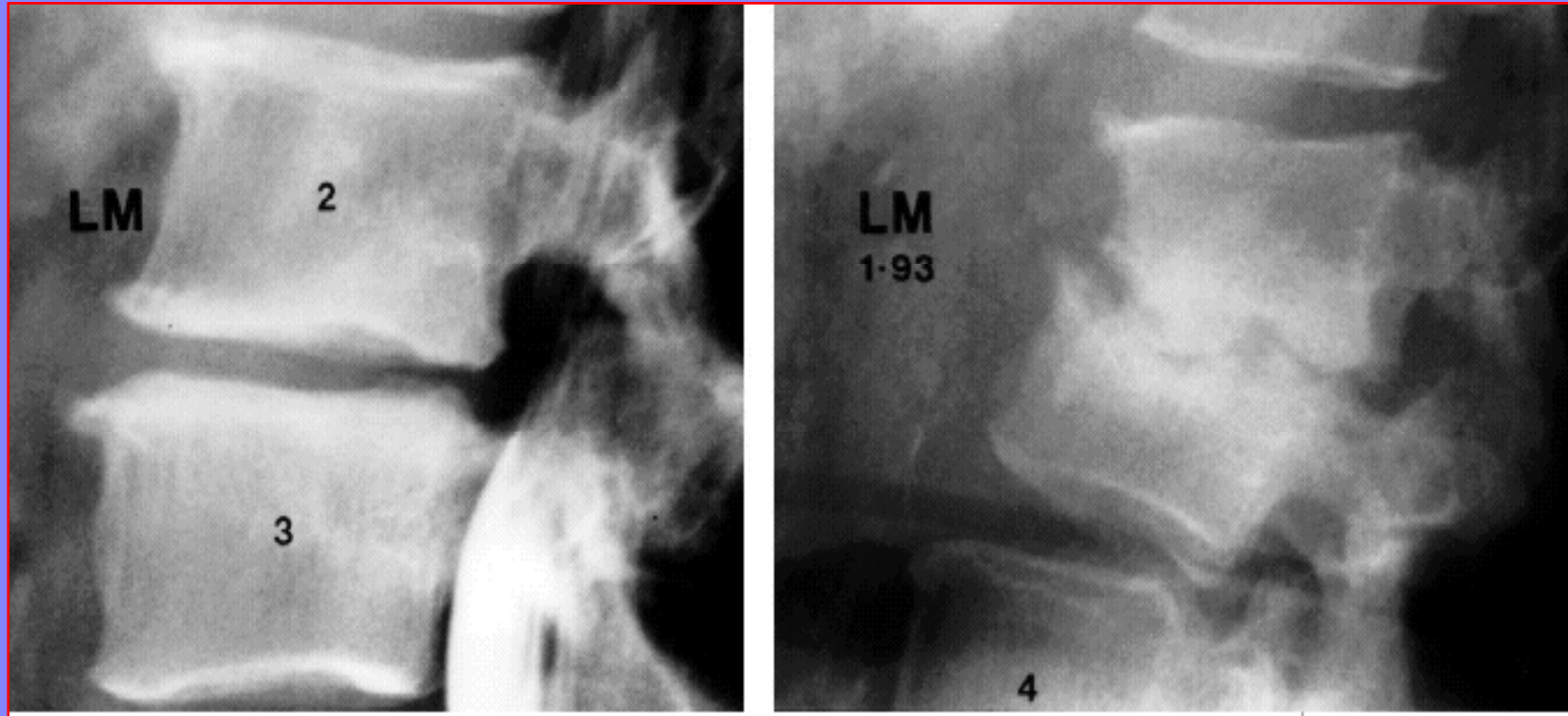
## Vertebral osteomyelitis



High signal is seen in the T12-L1 disk space and the L1 vertebral body on the T2-weighted sagittal sequence.







## Postoperative diskitis and osteomyelitis

# Treatment in vertebral osteomyelitis

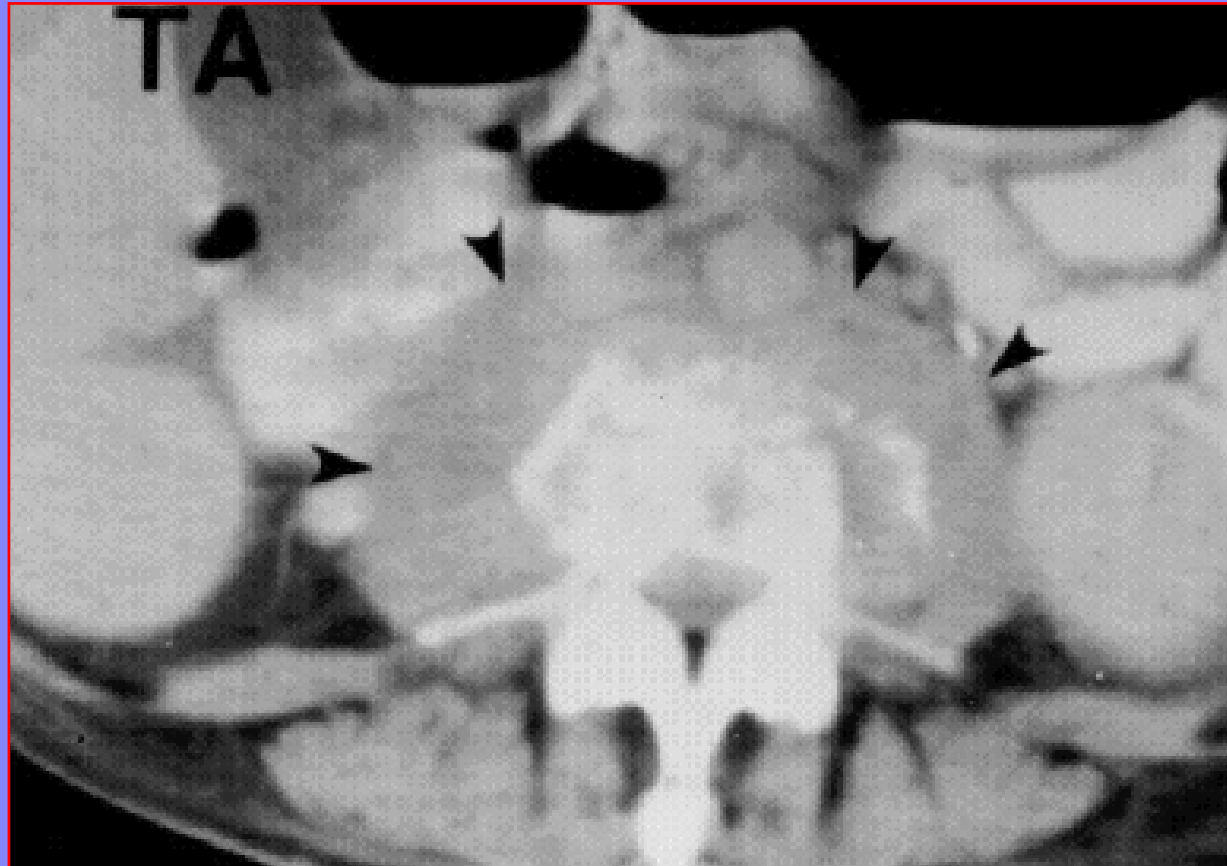
**6 W I.V antibiotics + oral antibiotics there after.**

*Molded total contact braces for the lumbar and low thoracic spine.*

**If cervical osteomyelitis is to be treated non surgically, a halo vest should be considered.**

# Indications for surgical treatment

- (1) Open biopsy**
- (2) Neurologic deficit**
- (3) Vertebral collapse esp. C. spine**
- (4) Abscess**
- (5) Failure of medical treatment.**



## Paraspinal abscess



## Paraspinal abscess

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## Brucellosis of lumbar spine

# Tuberculosis of the Spine

The principal mode of spread is hematogenous.  
The primary focus → lung, GIT, or GUT

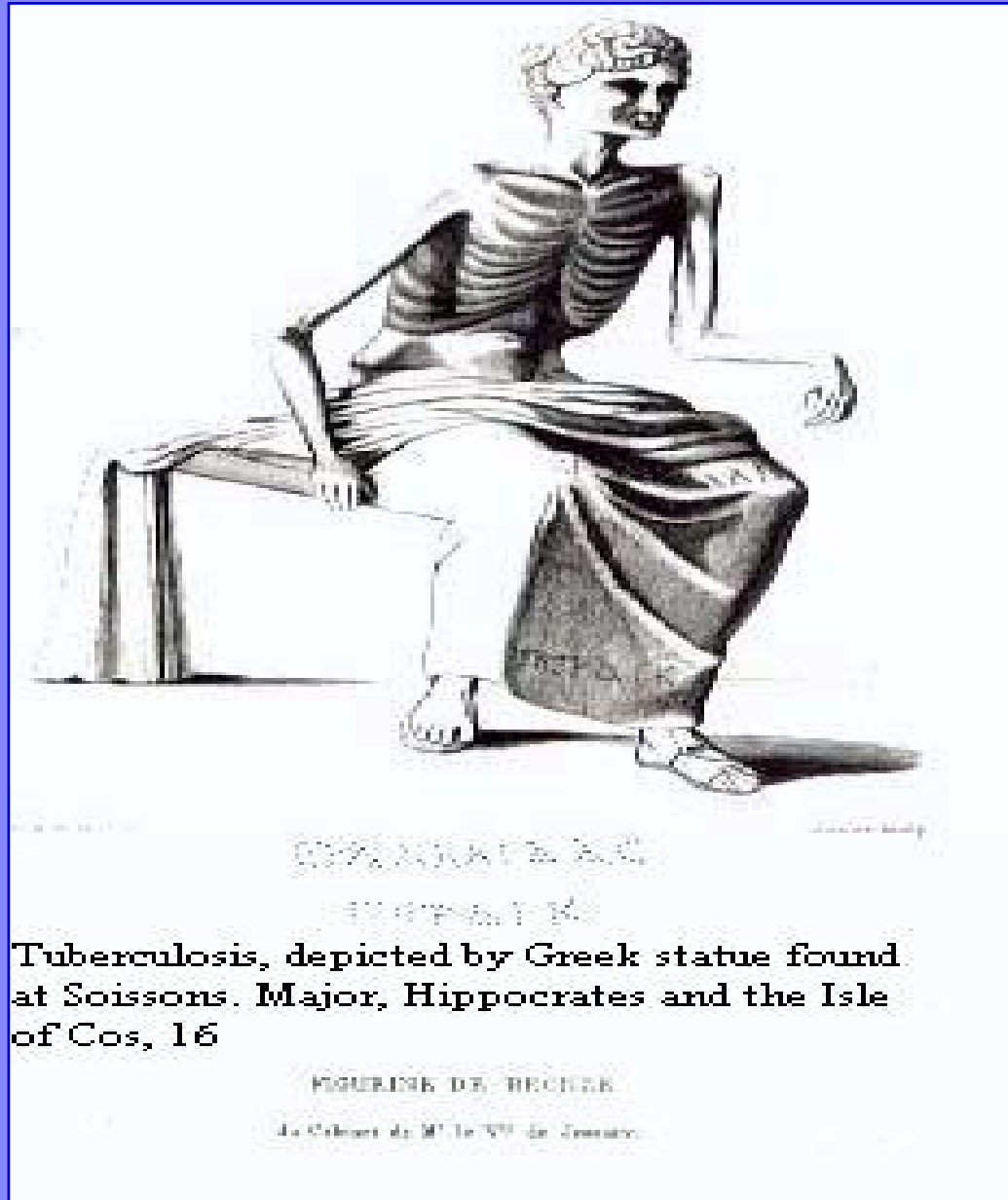


# Clinical presentation

= Slowly progressive spinal pain

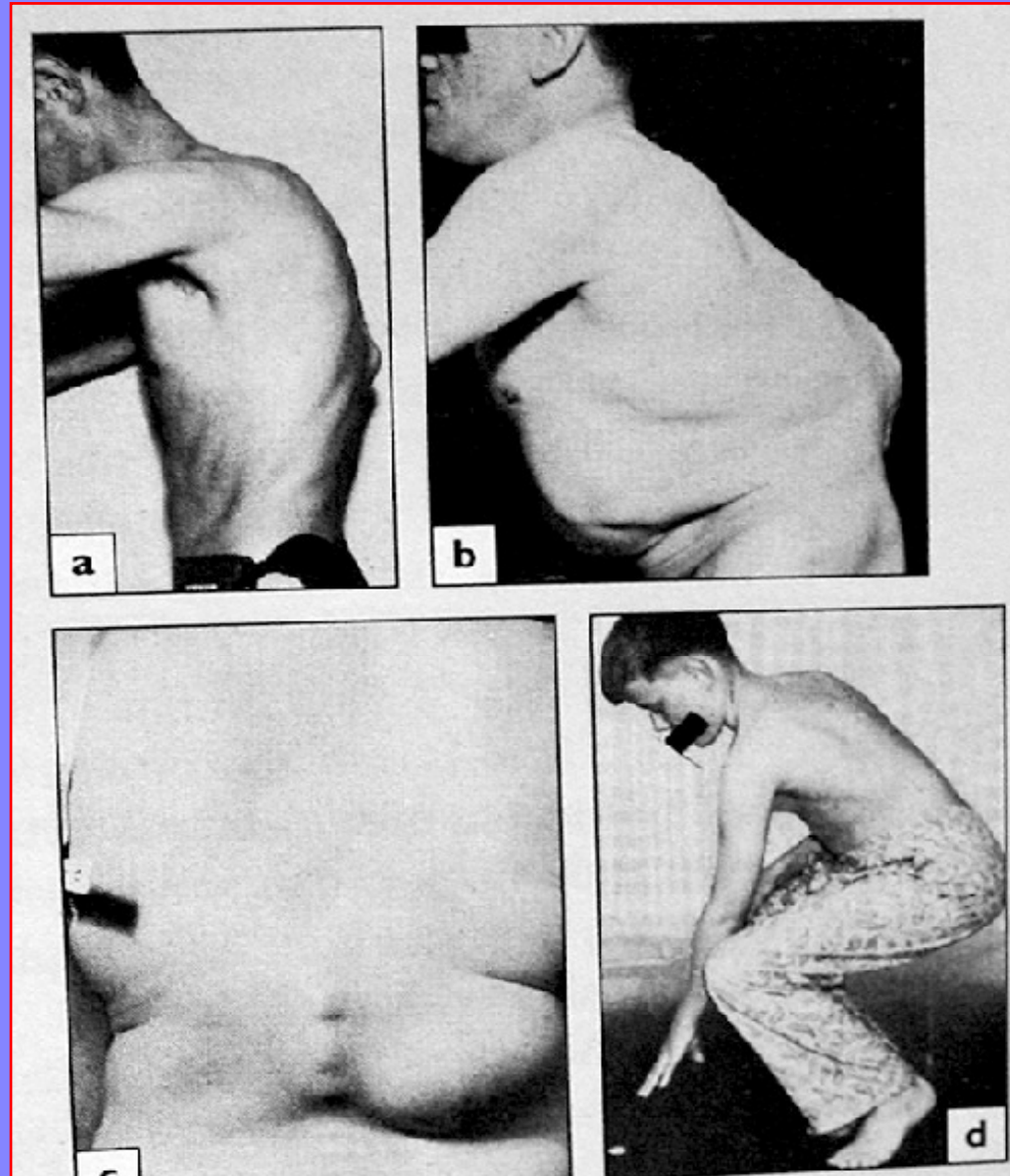
= Symptoms of a chronic illness,  
fever, malaise, Wt loss, anorexia .





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





# Radiological presentation

- Active & large lesion with abscess.
- Multiple levels.
- Healing & activity together with sclerotic lesion.
- Epidural abscess.
- Neurological impairment without obvious discrible vertebral lesion.

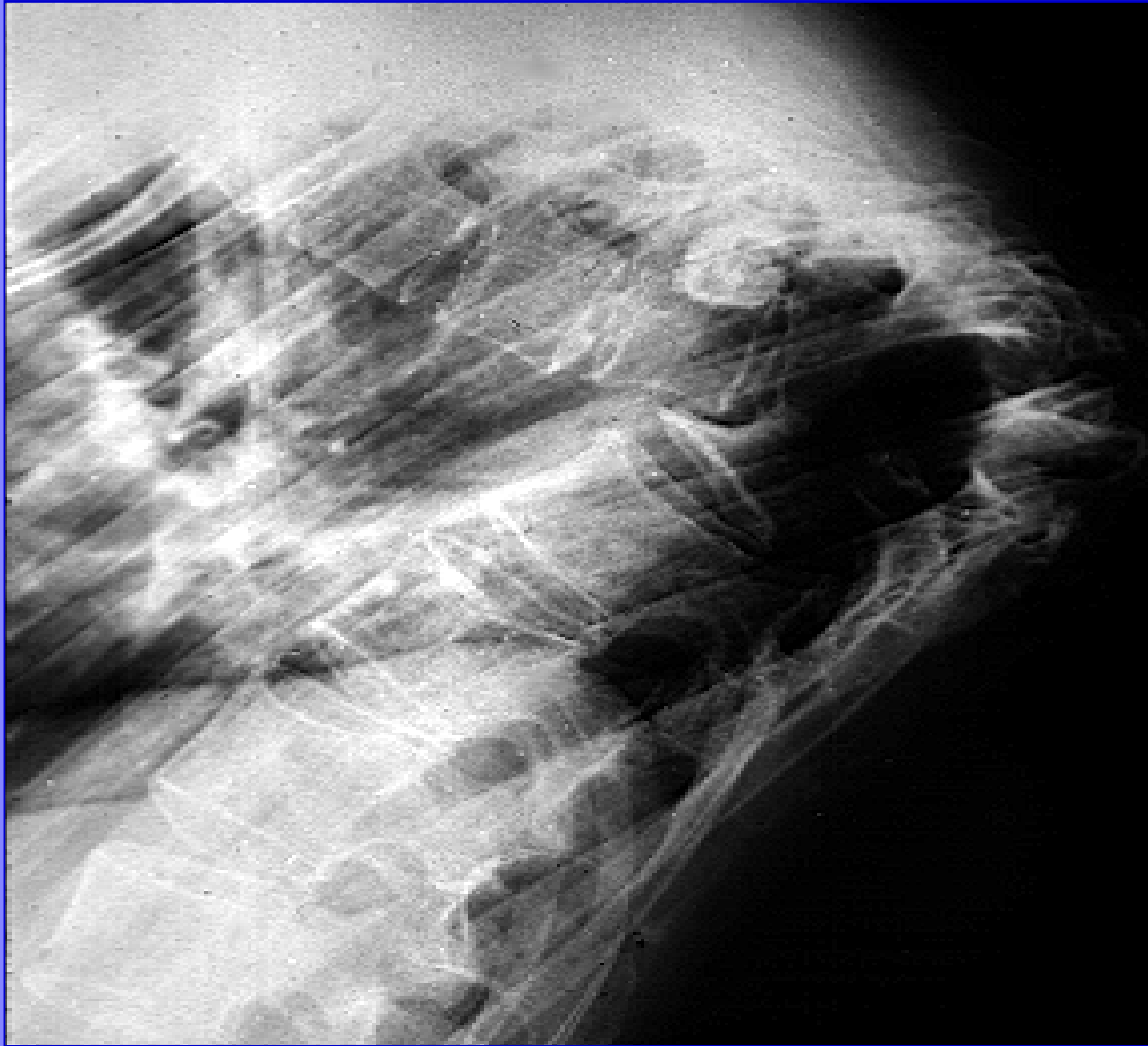
# Radiographs

= As vertebral osteomyelitis .

= Extensive destruction

*There is also a tendency towards preservation of the intervertebral disks until late in the disease.*

**T.B tends to involve more levels of the spine than pyogenic processes, and the abscesses tend to be more extensive.**



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# CT scans

= Extent of vertebral involvement & associated soft-tissue masses .

= *CT scans cannot distinguish granulation tissue from abscess formation.*

# **MRI scans modality of choice.**

**excellent definition of**

**1-The extent of vertebral involvement,**

**2-Spinal canal compromise,**

**3-Abscess formation .**

**4-Distinguish abscesses from granulation T.**



**Laboratory findings are nonspecific.**

**Most patients have an elevated ESR;  
the WBC count is highly variable.**

# TREATMENT

- **Chemotherapy is the mainstay, particularly for early disease, but increasing resistant to therapy is a cause of concern.**

# Operative treatment

- **Surgery is complementary & supplementary to chemotherapy.**
- **Indications**
  - Neurological deficit
  - Large abscess
  - Progressive destruction & Kyphosis
  - Instability

# Surgery

## ■ Earlier

- Only focal debridement and drainage of abscess
- Long bed rest

# Surgery

## ■ Currently

- Radical debridement & reconstruction
- Prevention & correction of kyphosis
- Instrumentation
- Give stability for early mobilisation

# **INSTRUMENTATION**

(Newer concept)

- **Anterior**
- **Posterior**
- **Combined**
  - adv:- (1) **Protect graft**
  - (2) **Encourage fusion**
  - (3) **Prevent & correct kyphosis**
  - (4) **Gives stability**
  - (5) **Early mobilisation**

# Anterior Instrumentation (One stage surgery)

- After radical debridement
- With graft or cage

## *Indications*

2 segment involved with kyphosis  
(Post. Element should be intact)

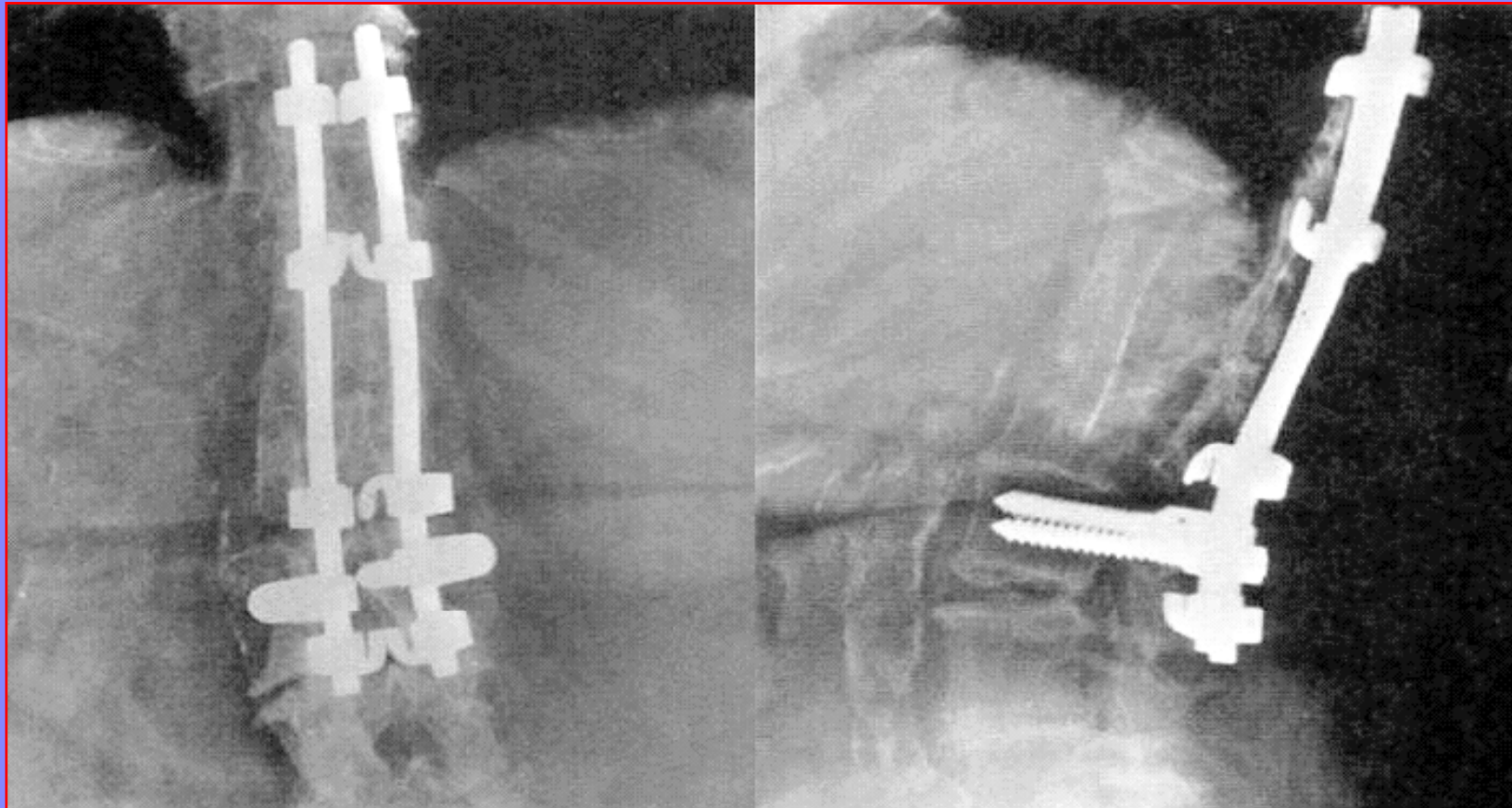
# Posterior Instrumentation (one stage surgery)

## ■ Indications:

- Post.element involvement
- Epidural abscess
- Tuberculoma
- Both element involvement

(postero-lat approach)



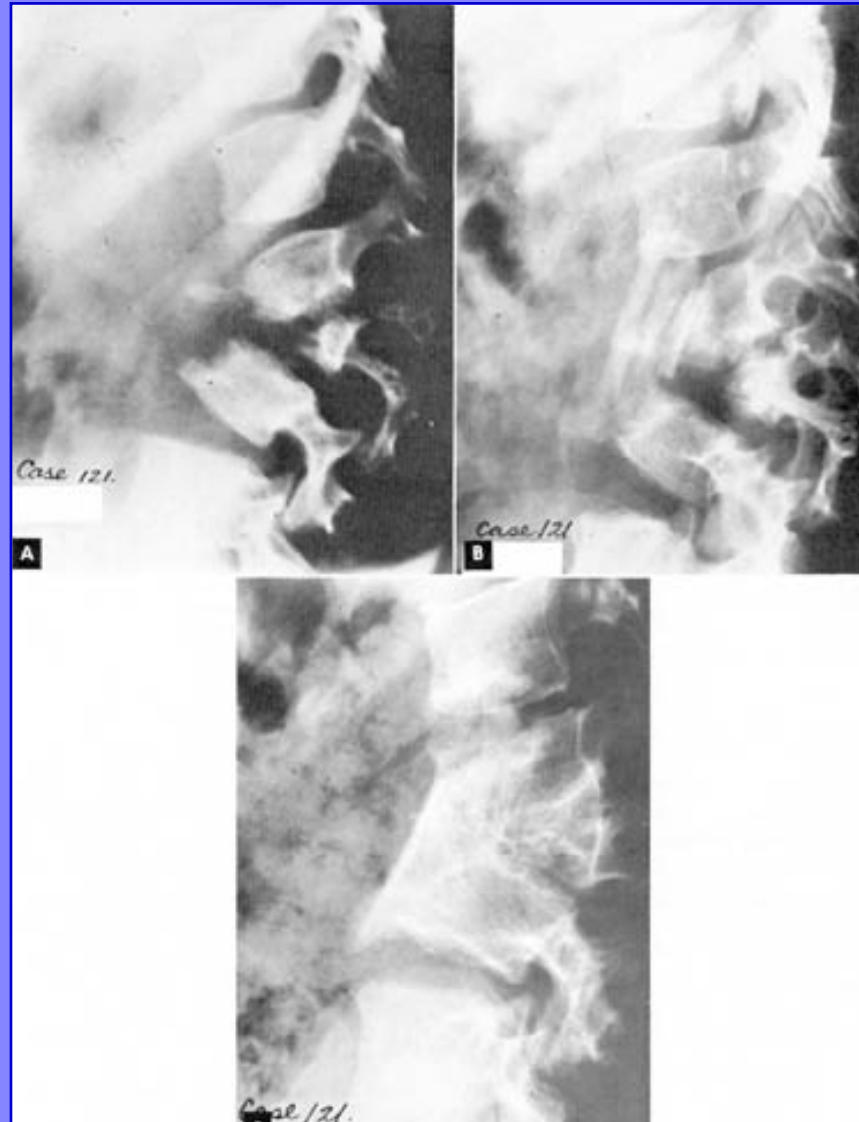


**Posterior fusion and instrumentation stabilized the spine after anterior L1 corpectomy and T12-L2 strut graft for the patient with L1 osteomyelitis**

# T.B.of spine in children

## (Newer concept)

- **Early surgical intervention-**
  - \* Children bet. 5-15 years
  - \* >2 segment involvement
  - \* Preexisting kyphosis > 30\*
- **Surgery-**
  - Anterior surgery with fusion and second stage post.fusion with/without instrumentation



**Tuberculosis of spine in 13-year-old girl.**

# Late cases (Newer concept)

- Reconstruction of ant. column with graft
- Shortening of posterior column with fusion
- Posterior instrumentation

# Endoscopic spine surgery (Newer concept)

## ■ ***MINIMALLY INVASIVE***

- \* **Debridement**
- \* **Decompression**
- \* **Interbody fusion**
- \* **Instrumentation ???**

# USG guided procedure

- **USG guided drainage of abscess cavity by putting catheter**

# Message

- **Be radical where indicated for**
  - \* **Prevention of deformity**
  - \* **Prevention of complications**
  - \* **Early mobilisation with help of current concepts**



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