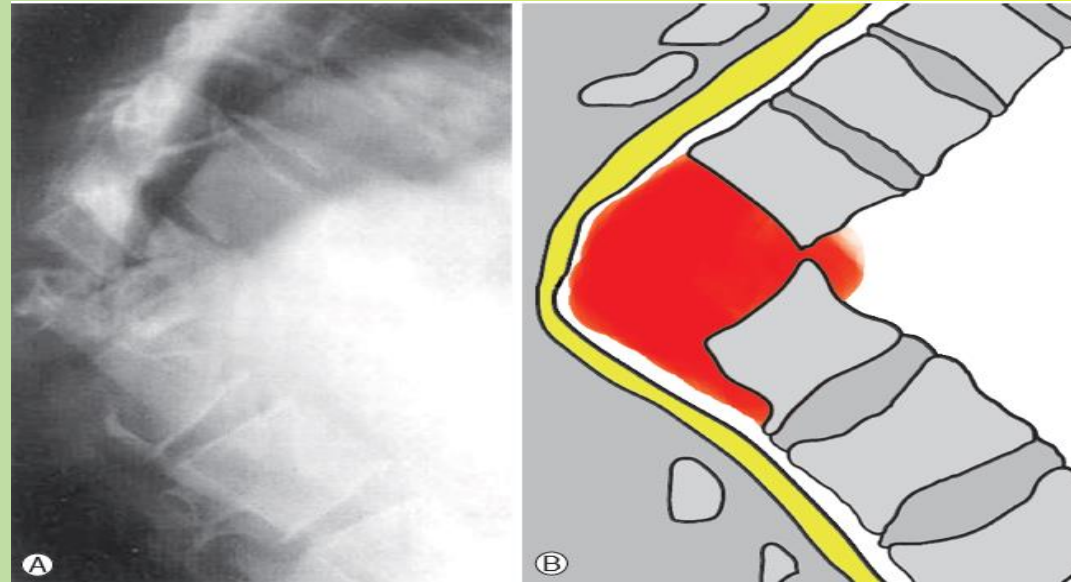


# Spinal tuberculosis



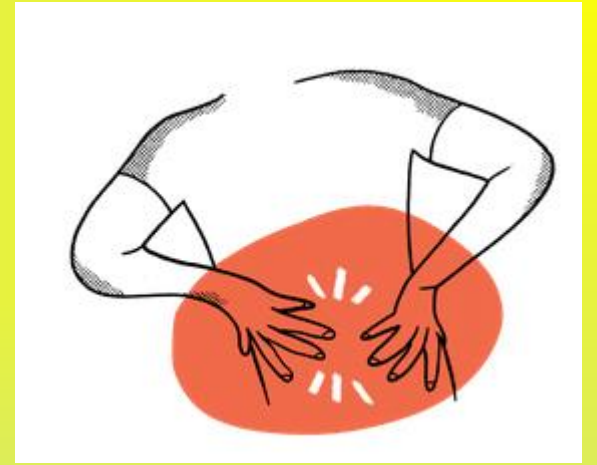
Dr. Ali Reza Davoudi  
Infectious Disease Specialist  
Associated Professor Of Mazandaran University Of  
Medical Sciences

# CASE PRESENTATION

- A 52-year-old male who presented for a two-week history of gradually increasing axial **low back pain that was worse with standing and physical activity.**
- He described the pain as sharp in nature, and stated that his activities of daily living (ADLs) were impaired by pain.
- He denied any fevers or weight loss, bladder or bowel incontinence, urinary symptoms, radicular pain in his buttocks or legs, or weakness in his lower extremities.



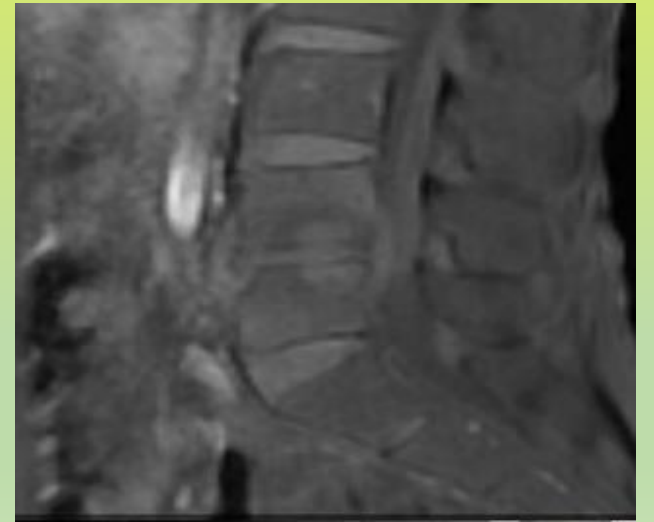
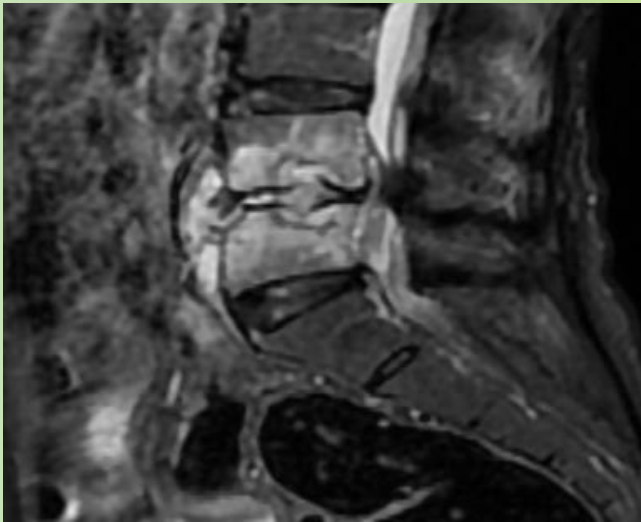
# CASE PRESENTATION



- On admission he was afebrile, with normal vital signs
- **Palpation and percussion of his back revealed point tenderness over his mid-lumbar spine.**
- Neurological examination of his bilateral lower extremities revealed 5/5 strength and normal sensation, no clonus, downgoing Babinski, and 2+ patellar and achilles reflexes

# IMAGING: MRI

A moderate narrowing of L4-L5 disc space  
with a low signal T1 high signal on T2/STIR of  
the L4, and L5 vertebral bodies



# SPONDYLODITIS

- Infection of the end plate and the adjacent vertebrae
- Referred to as *spondylodiscitis*, *disk space infection*, or *vertebral osteomyelitis*
- All with or without associated epidural abscess or psoas abscesses



# Differential diagnosis

## Vertebral Osteomyelitis

- Pyogenic (bacterial):

- ✓ *S. aureus*, coagulase-negative staphylococci, and *Streptococcus* spp. are the most common microorganisms encountered in vertebral osteomyelitis

- ✓ Gram-negative aerobic bacteria (commonly in intravenous drug abusers, immunosuppressed patients, and postoperative patients)

- **Mycobacterium TB**

- Brucellosis

- Fungi

## Tumors

# TB is classified as:

- Pulmonary
- Extra pulmonary
- Pulmonary & extra pulmonary
  
- Extra pulmonary TB may occur in 10–40% of patients
  
- TB of the bones and joints is responsible for ~10% of extra pulmonary cases

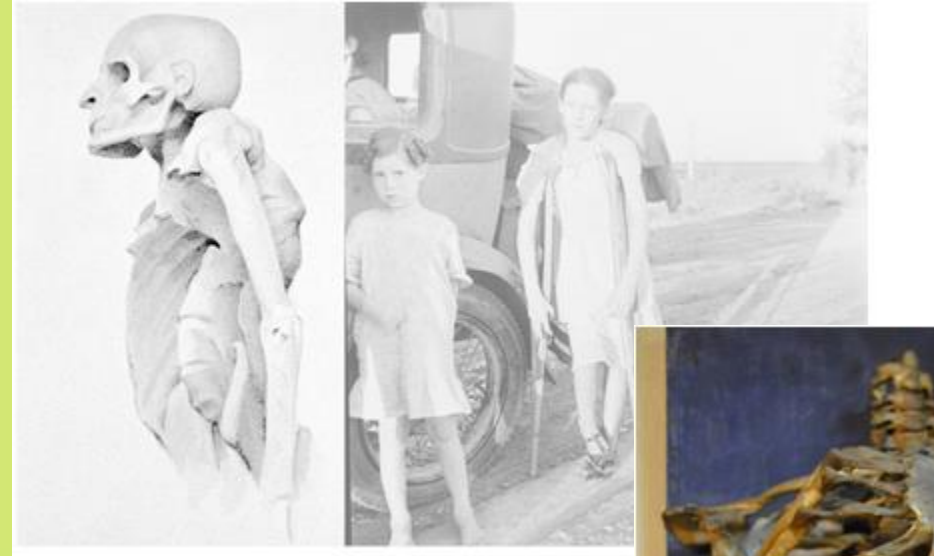
# Weight-bearing joints:

- Spine in 40% of cases
- Hips (13%)
- Knees (10%)



# Spinal TB

- Pott's disease
- Tuberculosis spondylitis
- Spinal tuberculosis
- One of the oldest documented diseases in humanity
- The first documented spinal tuberculosis (TB) cases date back to 5,000-year-old Egyptian mummies



# Pathogenesis:

1. Reactivation of hematogenous foci
2. Spread from adjacent paravertebral lymph nodes

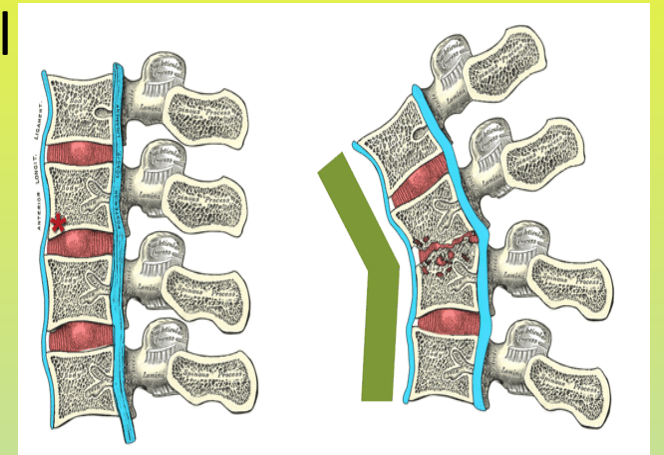
# Tuberculosis spondylitis

- Any part of the spine can be affected
- The lumbar or lower thoracic spine is most often involved
- The upper thoracic spine is the most common site of spinal TB in children
- The lower thoracic and upper lumbar vertebrae are usually affected in adults



# Pathogenesis:

- The disease usually begins in the anterior inferior angle of the vertebral body and spreads beneath the anterior (or posterior) longitudinal ligament to involve adjacent vertebral bodies, and secondarily the intervening disc(s)
- Often involves two or more adjacent vertebral bodies
- The abscess can spread infection to distant vertebral bodies, sometimes without affecting the intervening vertebrae
- Osteonecrosis and wedging of vertebral bodies causes a typical gibbus deformity



# Pathogenesis:

- Spinal TB can include any of the following:
  1. Progressive bone destruction leading to vertebral collapse and kyphosis
  2. Cold abscess formation (due to extension of infection into adjacent ligaments and soft tissues)
  3. spinal canal narrowing by abscesses, granulation tissue or direct dural invasion resulting in spinal cord compression and neurologic deficits



# Tuberculosis spondylitis

- A catastrophic complication of Pott's disease is paraplegia, which is usually due to an abscess or a lesion compressing the spinal cord
- Paraparesis due to a large abscess is a medical emergency and requires rapid drainage

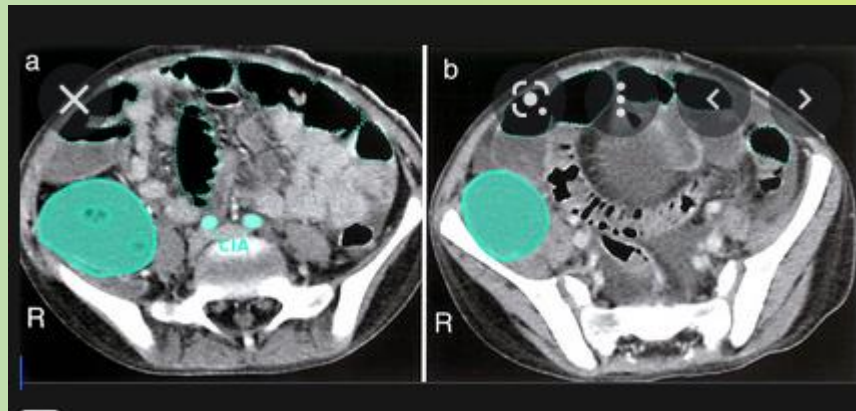
# Pathogenesis:

- A paravertebral “cold” abscess may form in the upper spine, this abscess may track to and penetrate the chest wall, presenting as a soft tissue mass



# Pathogenesis:

- ✓ In the lower spine, it may reach the inguinal ligaments or present as a psoas abscess





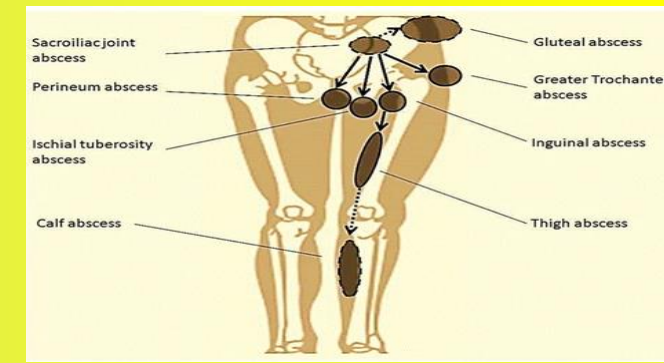
A fluid collection is located in the posterior part of L2 and L3, resulting in the elevation of the posterior ligament



Signal changes within the C5 and C6 vertebral bodies and pedicles consistent with bone edema are seen, along with a small anterior epidural collection consistent with discitis and epidural abscess.



# Tuberculosis spondylitis



- Para spinal cold abscesses develop in 50% or more, in some cases appearing after treatment has been initiated
- The pus, confined by tight ligamentous investments, can dissect along tissue planes for long distances to present as a mass or a draining sinus in the supraclavicular space, above the posterior iliac crest in the Petit triangle, or in the groin, the buttock, or even the popliteal fossa
- The abscess can spread infection to distant vertebral bodies, sometimes without affecting the intervening vertebrae

# Clinical presentation

**TABLE 249.11 Clinical Manifestations of Renal Tuberculosis in Two Series of Patients**

FACTOR OR FINDING	STUDY	
	SIMON ET AL. <sup>445</sup>	CHRISTENSEN <sup>446</sup>
No. of patients	102	78
Primarily genitourinary symptoms	61%	71%
Back and flank pain	27%	10%
Dysuria, frequency	31%	34%
Constitutional symptoms	33%	14%
Abnormal urine, no symptoms	5%	20%
Abnormal urinalysis	66%	93%
Abnormal intravenous pyelogram	68%	93%
Tuberculin positive	88%	95%
Abnormal chest radiograph	75%	66%
Active pulmonary tuberculosis	38%	7%
Other old or active extrapulmonary disease	5%	20%
Urine culture positive		
For tuberculosis	80%	90%
For routine pathogens	45%	12%
Epididymitis, orchitis	19%	17%
Chronic prostatitis	6%	6%

# Clinical presentation

- Evidence of other foci of TB and systemic symptoms are often Absent
- Early complaints may be back pain or stiffness with an initially
- Normal radiograph, and diagnosis may be delayed until signs of advanced disease such as paralysis, deformity, or sinus formation develop

# Brucellar or tuberculosis spondylodicitis

جدول شماره 1: فراوانی علائم و نشانه های بالینی بیماران مبتلا به اسپوندیلودیسکیت بروسلائی و سلی به تفکیک بیماری

علائم بیماران	بیماران بروسلائی فراوانی (درصد)	بیماران مبتلا به سلی فراوانی (درصد)	سطح معنی داری
تب	14 (66.4)	20 (62.5)	0.024
لرز	14 (66.4)	13 (40.6)	0.001
کاهش اشتها	21 (95.5)	30 (93.8)	0.79
کاهش وزن	10 (45.5)	17 (53.1)	0.58
ضعف	14 (66.4)	23 (71.9)	0.20
تورم	18 (81.8)	14 (43.8)	0.005
راه رفتن (Coff)	4 (19.1)	14 (43.8)	0.03
اختلال حس	2 (9.1)	4 (12.5)	0.69
اختلال استفراغ	1 (4.5)	0	0.22
آرتروفی عضلات اندام ها	0	3 (9.4)	0.14
کوزیشی	0	3 (9.4)	0.14
فیستول	0	2 (6.3)	0.23

جدول شماره 2: فراوانی و درصد فراوانی یافته های حاصل از تصویربرداری بیماران به تفکیک بیماری

یافته ها	بیماران بروسلائی فراوانی (درصد)	بیماران سلی فراوانی (درصد)	سطح معنی داری
وجود آبسه	2 (9.1)	8 (24.5)	0.14
ضایعات دژنراتیو	17 (57.3)	29 (90.6)	0.007
انفرکشنری بر مطلق نخاعی	6 (27.3)	7 (21.9)	0.85
دیسکریته	4 (13.8)	13 (40.6)	0.08
نوع آسیب اسکروئیک	12 (37.5)	6 (18.8)	0.006
پینیک	10 (35.5)	26 (81.3)	0.006
مهره درگیر گردنی	0	4 (12.5)	0.12
سینه ای	1 (3.5)	15 (46.9)	0.009
کمری	15 (47.2)	6 (18.8)	0.009
ساکرال	1 (3.5)	1 (3.1)	0.97
چندگانه	5 (15.2)	6 (18.8)	0.006
تعداد مهره های درگیر	2.4±1.09	2.3±1.05	0.72

# Diagnosis

- Differentiating spinal TB from pyogenic and fungal vertebral osteomyelitis as well as primary and metastatic spinal tumors may be difficult when only clinical and radiographic findings are considered
- Biopsy plays a valuable role in the diagnosis of spinal TB infection
- The diagnosis should rely on the presence of *M. tuberculosis* on stain or culture of a biopsy specimen.
- The use of DNA amplification techniques (polymerase chain reaction or PCR) may facilitate rapid and accurate diagnosis of the disease.
- Culturing the organisms is slow and may be inaccurate.

# Therapy

**Table 1.** WHO recommended treatment regimens for different disease categories [50]

Disease category	Tuberculosis patient definition	Treatment regimen	
		Initial phase (daily or three times weekly)	Continuation phase (daily or three times weekly)
I	New smear-positive New smear-negative with extensive parenchymal involvement New severe extra-pulmonary tuberculosis or severe concomitant HIV infection	2 HRZE	4 HR or 6 HE daily
II	Previously treated sputum Smear-positive pulmonary tuberculosis - Relapse - Treatment after interruption - Treatment failure	2 HRZES/1 HRZE	5 HRE
III	New smear-negative pulmonary tuberculosis Extra-pulmonary tuberculosis	2 HRZE	4 HR or 6 HE daily
IV	Chronic and MDR tuberculosis	Specially designed standardized or individualized regimens	

# Therapy

- A 6- to 9-month course of therapy that contains INH and RIF
- Adjunctive surgical debridement or resection of the involved bone plus bone grafting did not improve outcome compared with antituberculosis therapy alone



## The indications for surgery in Pott's disease

- Cases with neurologic deficit
- Paravertebral abscess
- Spine instability due to kyphotic deformity (especially in kyphotic angles of 50 to 60 degrees or more which is likely to progress)  
resistance to the current antituberculosis drugs (which is more encountered nowadays in association with the presence of human immunodeficiency virus [HIV] infection)
- To prevent/treat complications such as late-onset paraplegia

# Peripheral Osteoarticular Tuberculosis

- A chronic, slowly progressive monoarthritis (90% of cases) Often without systemic symptoms
- Most frequently in the hip or knee
- Tuberculous osteomyelitis can affect any bone, including the ribs, skull, phalanx, pelvis, and long bones
- Other causes of osteomyelitis of the rib are rare, and TB is the most common infectious cause of single or multiple osteomyelitic rib lesions

# Peripheral Osteoarticular Tuberculosis

More recent reports suggest a shift to an older population with a different clinical picture, including more systemic symptoms, multiple joint involvement, and periarticular abscess formation

- Tenosynovitis of the hand, arthritis of the wrist, and carpal tunnel syndrome can be caused by TB



**Thanks a lot for your attention**