



July 2002

# Extra-Pulmonary Tuberculosis

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# Our First Patient

- 32 year old man from Brazil
- Remote history of gunshot wound
- **One month history of:**
  - Bilateral lower extremity pain
  - Progressive ataxia
  - Sensory Loss
  - Night sweats
  - Weakness
  - Urge Incontinence



# Physical Exam

- Spastic Legs
  - Hyper-reflexia
  - Sensory Loss
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- Cord Lesion (upper motor neuron, sensory neuron) at T4



# Possible Imaging Modalities

- **X-ray**
  - Poor sensitivity for spinal injuries
- **CT**
  - Indicated for bony abnormalities and fractures
  - Myelogram - for stenosis or tumors
- **MRI**
  - Spinal cord
  - Blood Clots
  - Disks
  - Soft Tissue Masses
  - Degree of Involvement



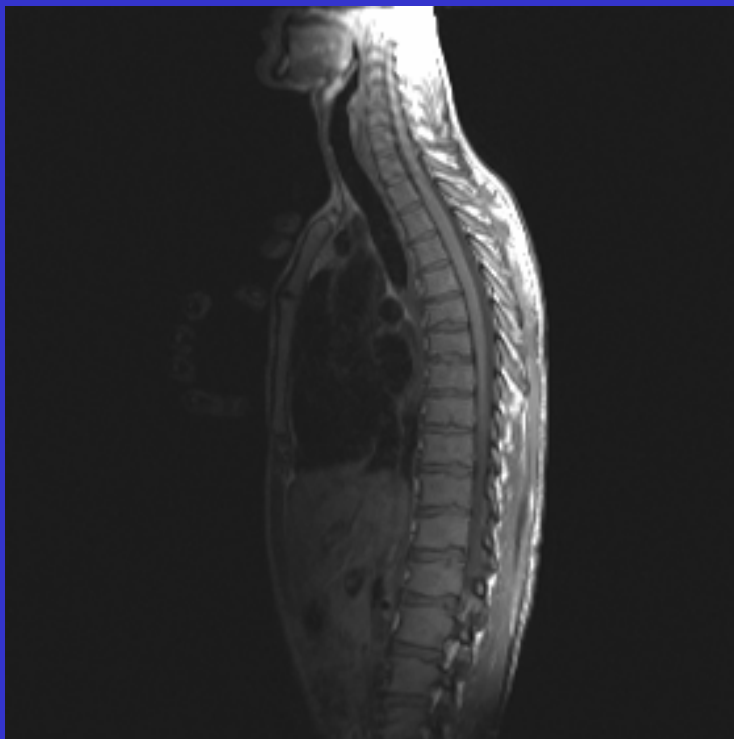
# KUB



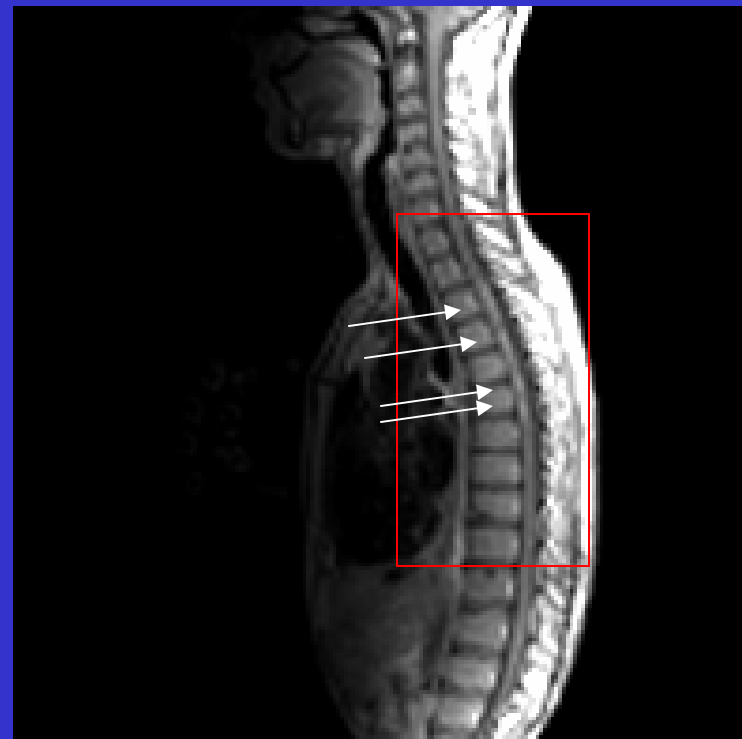
An abdominal film was ordered, to determine the presence and location of the bullet from a previous wound



# MRI - T1 Weighted



T1 Weighted Image Without Contrast



T1 Weighted Image With Contrast



# MRI - T2 Weighted



At around T1 (arrow) we see enhancement of the spinal cord, indicating fluid within the cord itself.



# Differential Diagnosis

- Patchy Enhancement/Thickening on MR
  - Extrinsic Compression
    - Disk
    - Tumor
  - Infectious
    - TB/Brucellosis/Fungal
  - Inflammatory
    - MS
    - Myelitis
  - Neoplasm
    - Ependymoma, astrocytoma
  - Syringomyelia, Hydromyelia
- Next Step:
  - Cord Biopsy and Culture



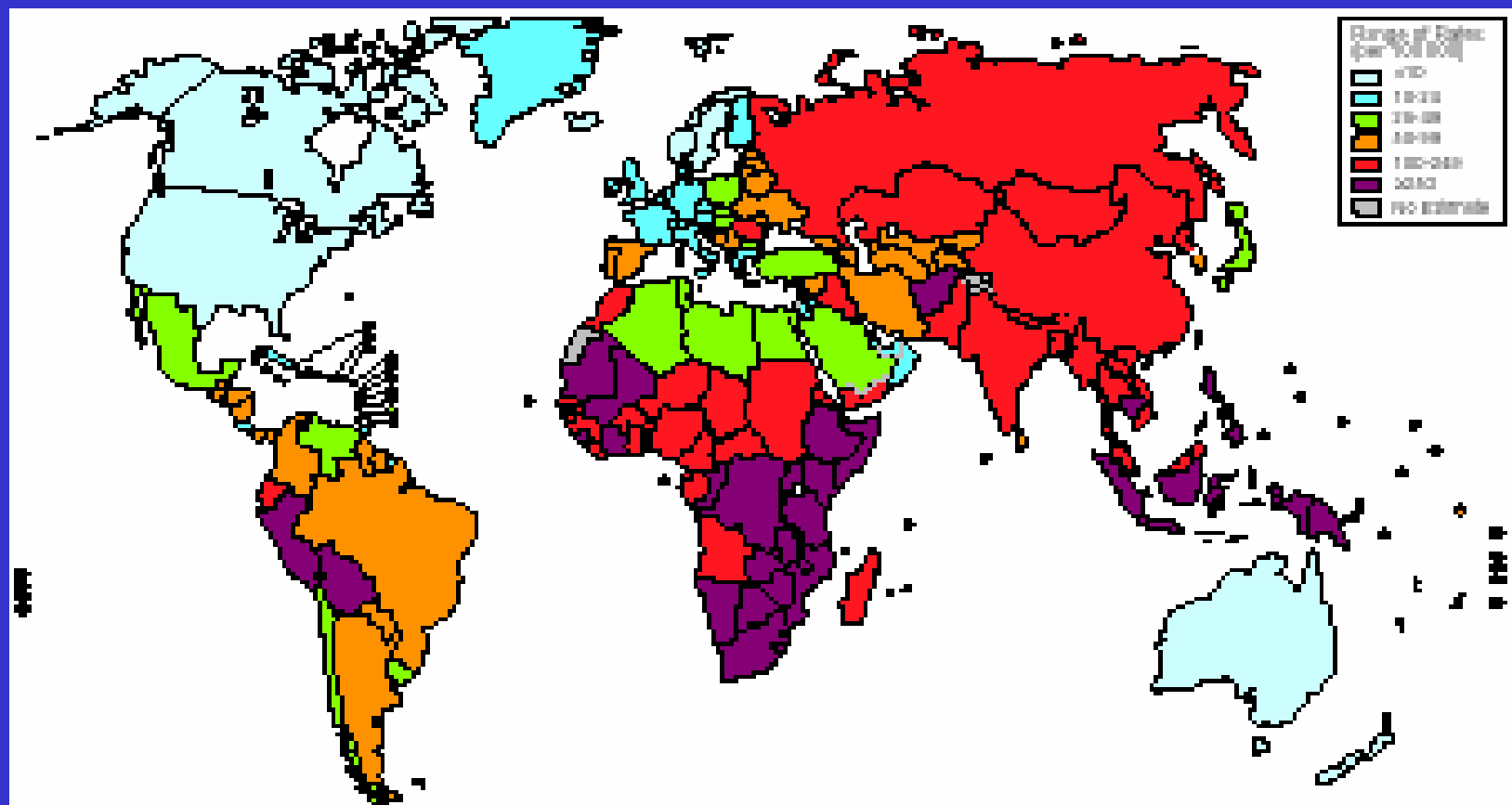


# Diagnosis: Pott's Disease

- Tuberculosis involving the Vertebral Bodies
- Interesting Information about Pott's Disease
  - Evidence of Pott's Disease has been found in the vertebrae of Egyptian mummies dating from 3000 BC
  - 1-5% of TB cases have skeletal involvement
  - 50% of patients with Pott's disease have no pulmonary manifestations
- TB is clinically relevant in the U.S.
  - 2-8% of people with HIV will contract TB (CDC)
- TB is clinically relevant worldwide



# Global Prevalence of TB





# Extrapulmonary TB - page 1

- Abdominal
  - Peritonitis
  - Hepato-Splenic
- Genito-Urinary
  - Renal
  - Urethral
  - Bladder
  - Genital
- Lymph Nodes
- Breast



# Extrapulmonary TB - page 2

- CNS
  - Meningitis
  - Parenchymal (Tuberculomas)
- Musculoskeletal Involvement
  - Spondylitis (Pott's Disease)
  - Osteomyelitis
  - Dactylitis
  - Arthritis

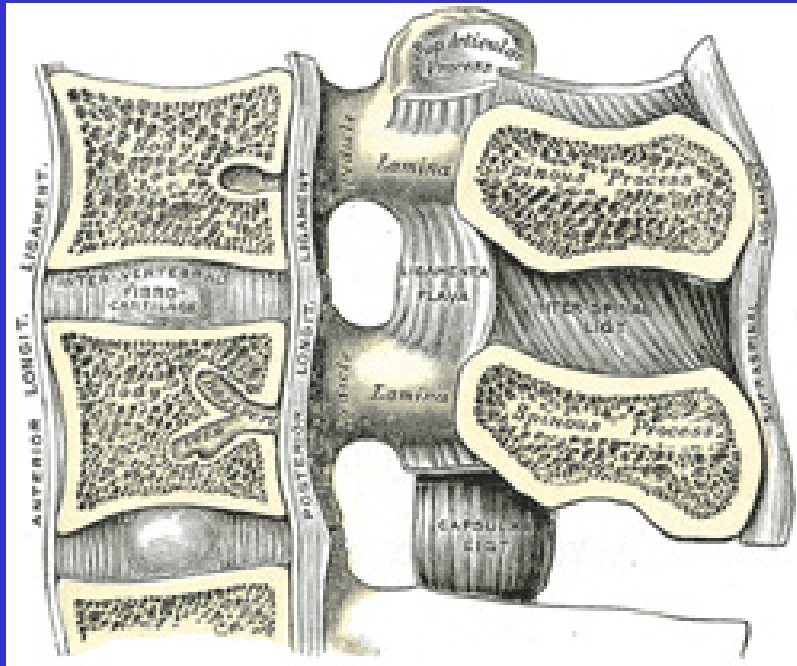


# Etiology of Musculoskeletal TB

- Hematogenous spread through vertebral arteries
- Soft tissue involvement will result in
  - Abscess (quite large in TB, versus other infections)
  - Phlegmon



# Access to the Spinal Column



Gray's Anatomy  
<http://www.yahooligans.com/reference/gray/72.html#4>

- Bacteria lodge under the end plate and spread
  - Directly to disk
  - Across the joint space
  - Under the anterior and posterior longitudinal ligaments



# Musculoskeletal TB

- Characteristic features found in our Patient
  - Inflammation of the Spinal Cord
- Other Characteristic Features
  - Preferential Involvement of L1
  - Erosion of Endplates
  - Involvement of multiple vertebral segments
    - Preferentially anterior destruction
    - Resulting in Kyphosis
  - Elongated paravertebral abscess
    - May calcify (Pathognomonic)
  - Narrowing of Joint Space
    - Usually in TB shows relative sparing of joint space, until late in disease



# Our Second Patient

- 25 year old man from Kenya
- **Four month history of:**
  - Pain, tingling, burning of left thigh
- **One month history of:**
  - Lower back pain
- **9 day history of:**
  - Severe left thigh pain
- **5 day history of:**
  - Diarrhea, night sweats



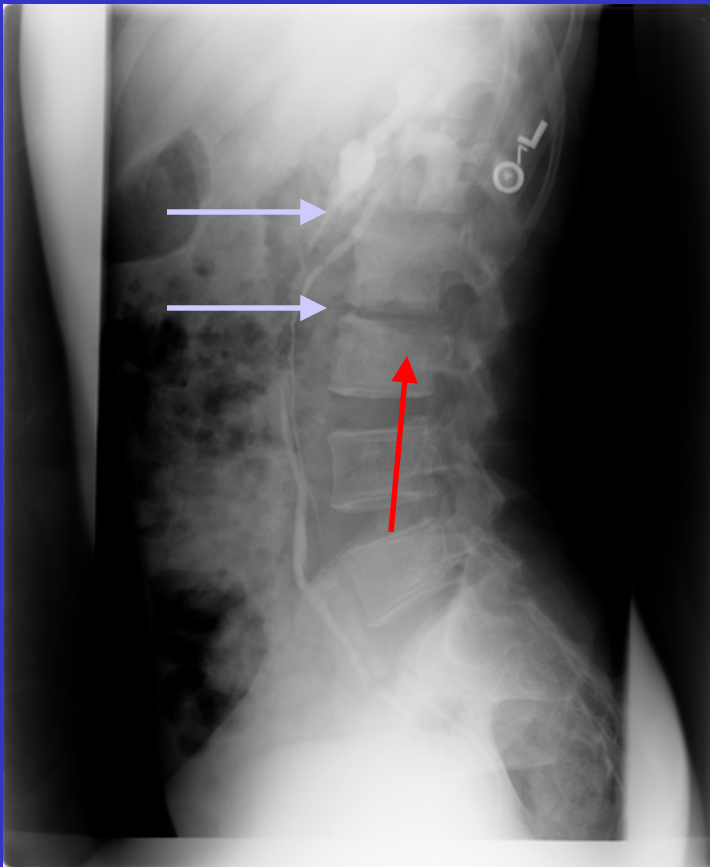


# Our Second Patient

- Other Relevant History:
  - BCG vaccine
  - 2 years ago lived with a cousin who was diagnosed with TB



# Abdominal X-ray

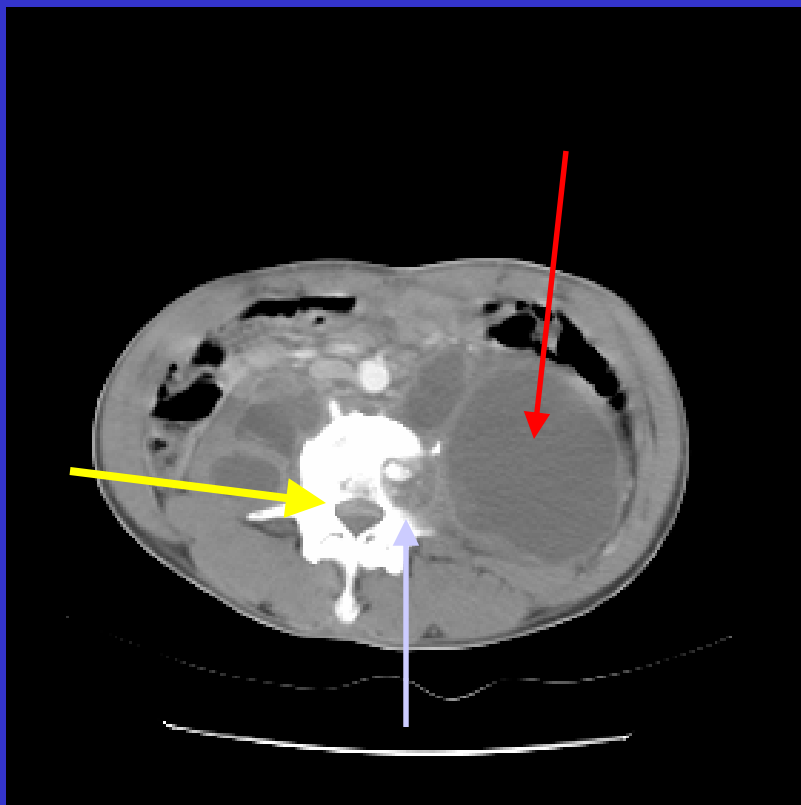


- Characteristic Findings:

Narrowing of disk space  
Involvement of end plate  
Destruction of vertebral body



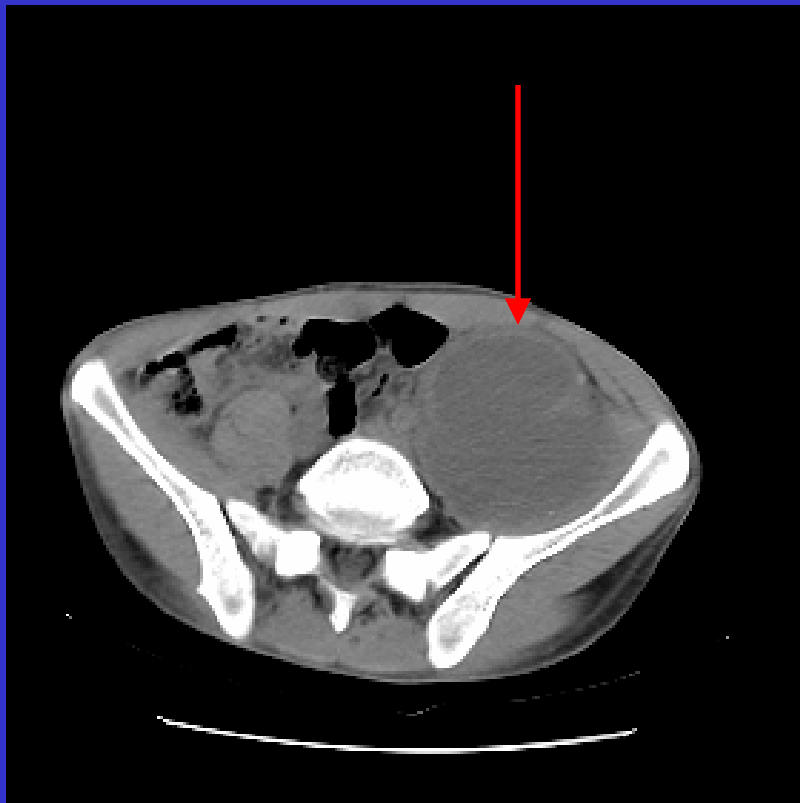
# Characteristic CT Findings



- Destruction of the vertebral body
- Enhancing region within cord
- Large paravertebral abscess



# CT of the Psoas Abscess



Extending into the Pelvis



Extending into the Thigh



# CT Coronal View



- Large paravertebral abscess extending from upper kidney to groin



# Treatment



Drain the Abscess

IV and Oral Antibiotics

L2-L3 Vertebrectomy



# Acknowledgements

Michelle Swire, MD

Phillip Boiselle, MD

Daniel Saurborn, MD

Priscilla Slanetz, MD, MPH

- Larry Barbaras and Cara Lyn D'amour  
our Webmasters
- Gillian Lieberman, MD
- Pamela Lepkowski



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