

An anatomical illustration of a human spine, viewed from the back. A yellow band is wrapped around the lower back, highlighting the cauda equina region. The spine is shown in a light blue color, and the surrounding muscles and ligaments are depicted in various shades of brown and pink.

# Cauda equina syndrome and other emergencies

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# Definition

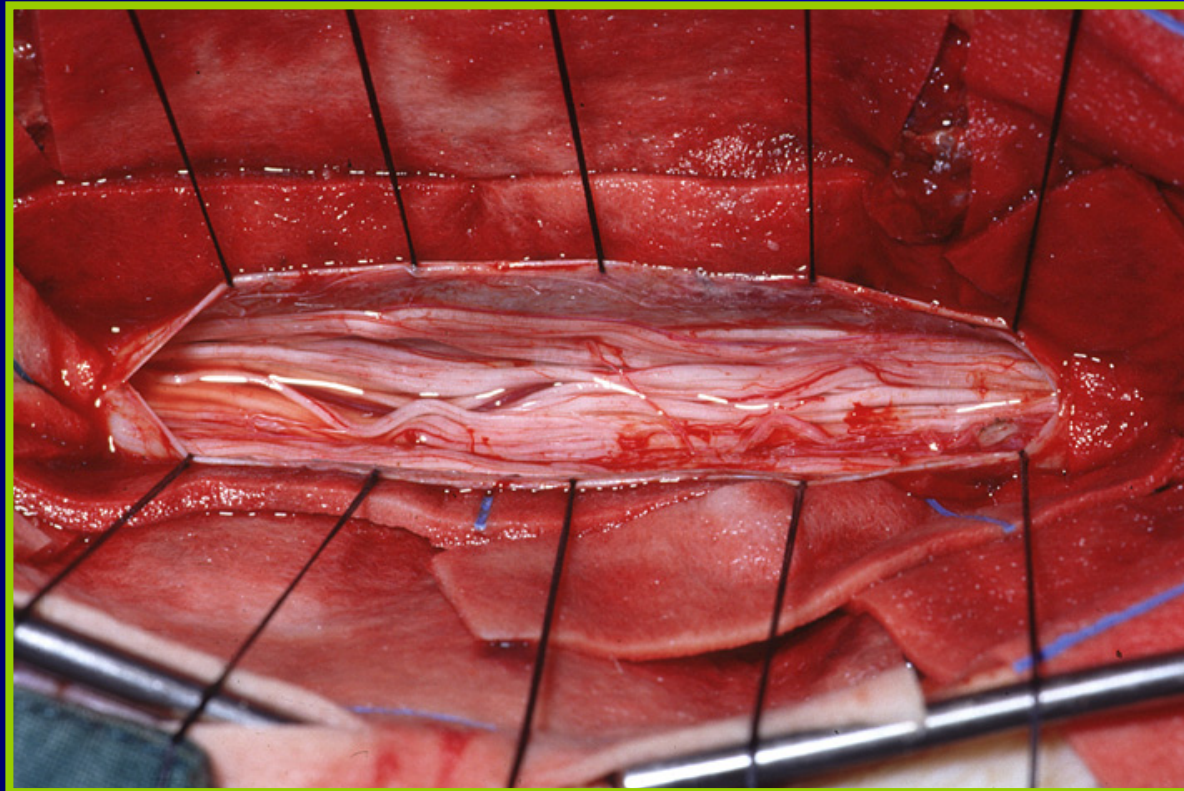
- A neurosurgical spinal emergency is any lesion where a delay or injudicious treatment may leave.....
- The patient
- The surgeon
- and the barristers



# Causes of acute spinal cord and cauda equina compression

- Degenerative
  - Lx / Cx / Tx disc prolapse
  - Cx / Lx Canal stenosis
  - Osteoporotic fracture
- Trauma
  - Instability
  - Penetrating trauma
  - Haematoma
  - Iatrogenic e.g Surgiceloma
- Infection
  - Vertebral body
  - Discitis
  - Extradural abscess
- Tumour
  - Metastatic
  - Primary
- Vascular
  - Spinal DAVF
- Developmental
  - Syring / Chiari malformation

# Cauda Equina Syndrome



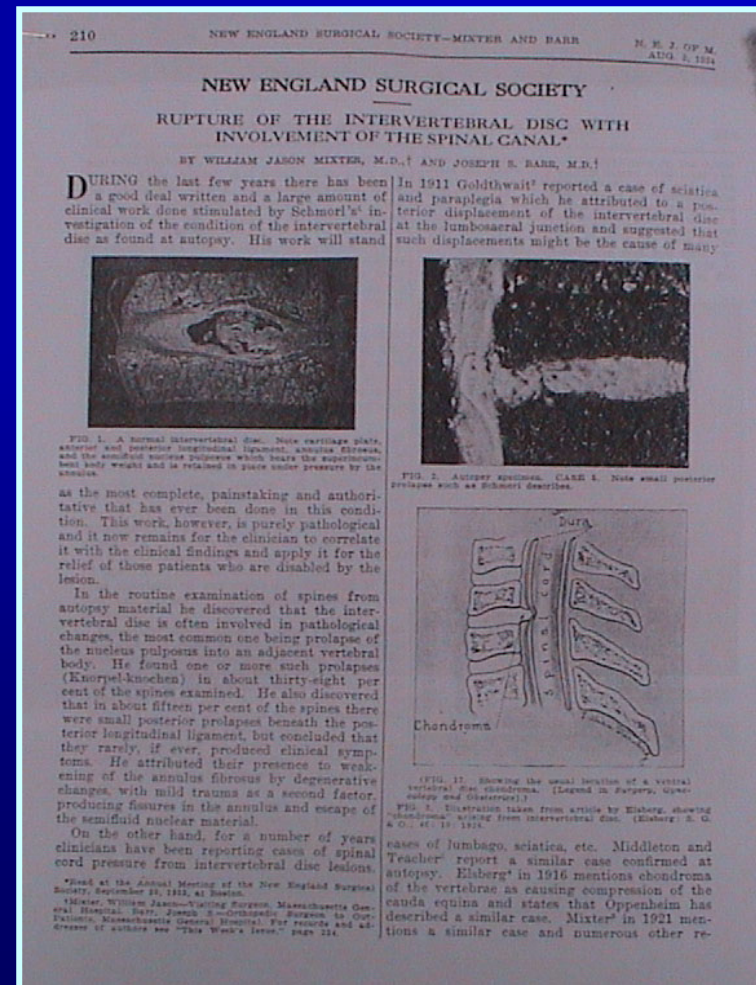
*Kostuik JP. Controversies in cauda equina syndrome. Current Opin Orthopaed. 1993; 4 ; 125 - 8*



# Lumbar disc prolapse



William Mixer



## Cauda Equina Syndrome : Clinical presentation

- Bilateral sciatica
- Saddle anaesthesia
- Sphincter disturbance
  - urinary retention: check post-void residual
    - 90% sensitive ( but not specific )
    - Very rare for pt without retention to have cauda equina
  - urinary / faecal incontinence
  - anal sphincter tone may be reduced in 60 - 80% pts
- Motor weakness / Sensory loss
- Bilateral loss of ankle jerk

# Investigations

## Radiological

Plain X-rays

X

MRI

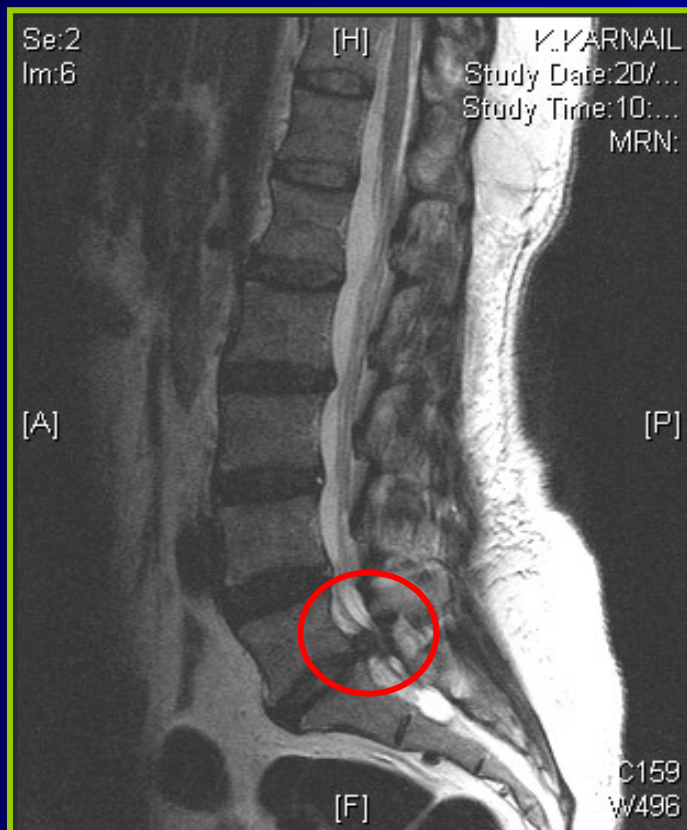
CT

Myelography

You'll be lucky !

# Central disc prolapse

35 yr female acute cauda equina syndrome

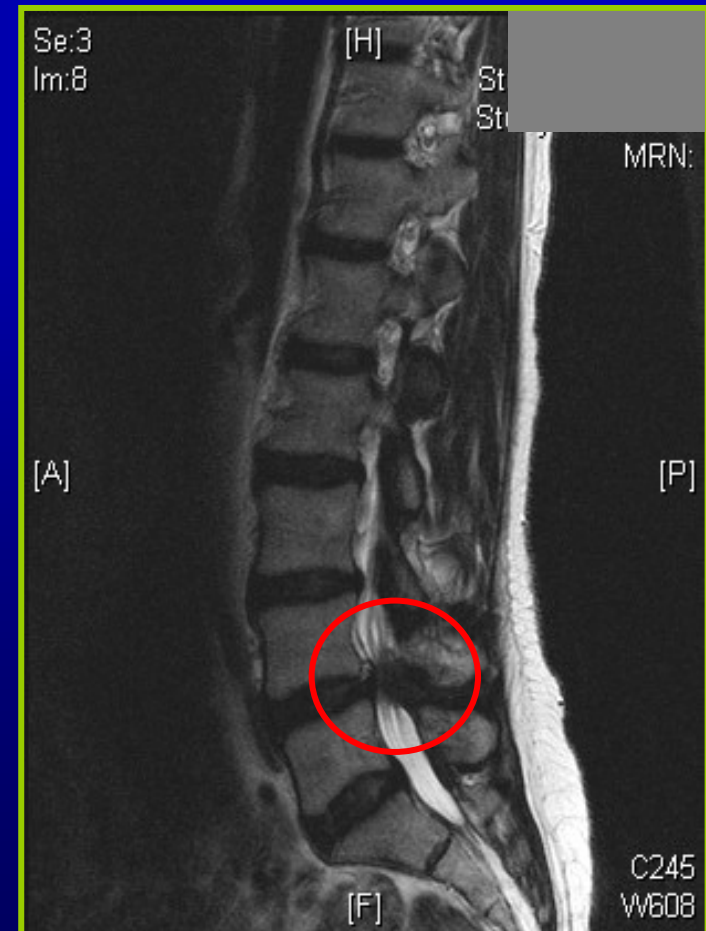
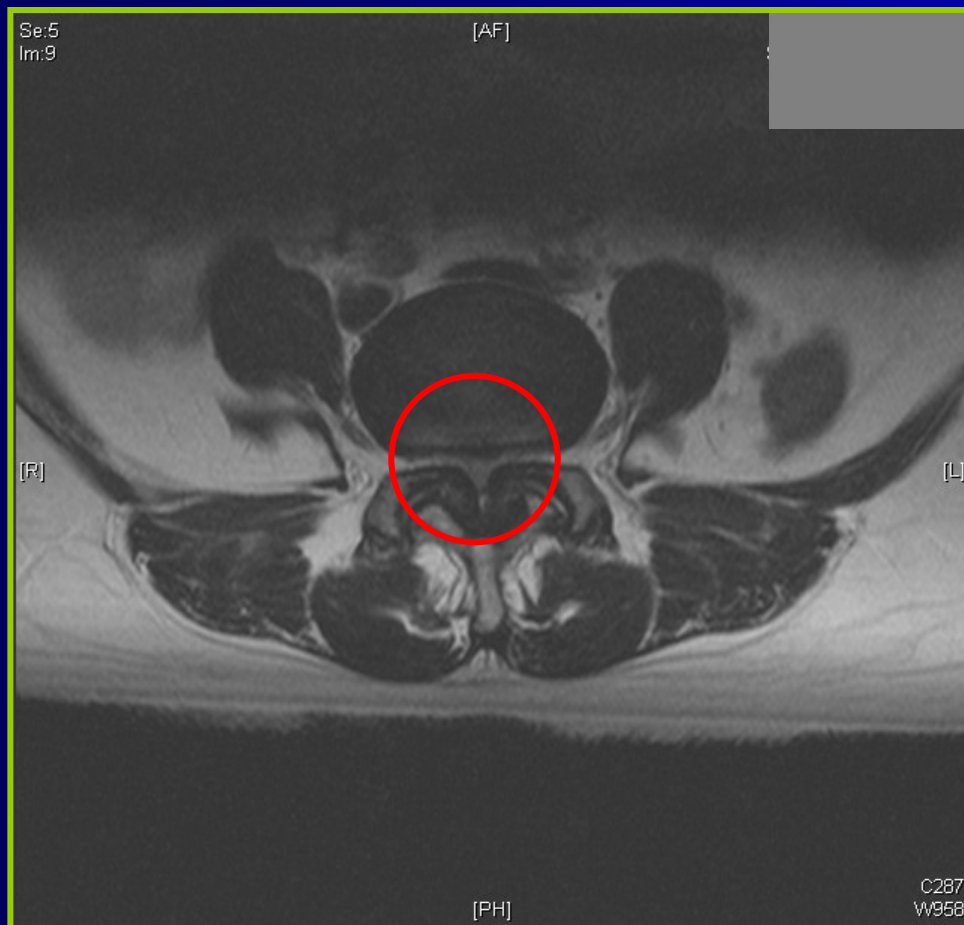




# Lumbar Canal Stenosis

50 yr female with acute on chronic cauda equina syndrome

Congenital narrow canal + PID



# Management

- Decompression
  - Lx Laminectomy
  - Hemilaminectomy
  - Microdiscectomy
- Complications
  - Incomplete decomp.
  - CSF leak



# Outcome and relationship to time of onset to surgery

Cauda equina syndrome secondary to lumbar disc herniation : a meta-analysis of surgical outcomes.

*Ahn UM et al . Spine 2000 : 25; 1515 – 1522*

*‘ a significant advantage to treating patients within 48 hrs versus more than 48 hours after the onset of CES’*

*Loss of bladder function is associated with poor prognosis*

# Outcome and relationship to time of onset to surgery

Cauda equina syndrome: the timing of surgery probably does influence outcome

*Todd N.V. Br. J. of Neurosurgery. 2005; 19 : 301 – 306*

Patients treated earlier than 24hrs after the onset of CES are more likely to recover bladder function than those treated beyond 24 hrs

Patients treated earlier than 48hrs after the onset of CES are more likely to recover bladder function than those treated beyond 48 hrs

# Cervical disc prolapse and spinal cord compression

- Usually traumatic
  - Axial loading with flexion
- Cord injury
  - Complete
  - Incomplete

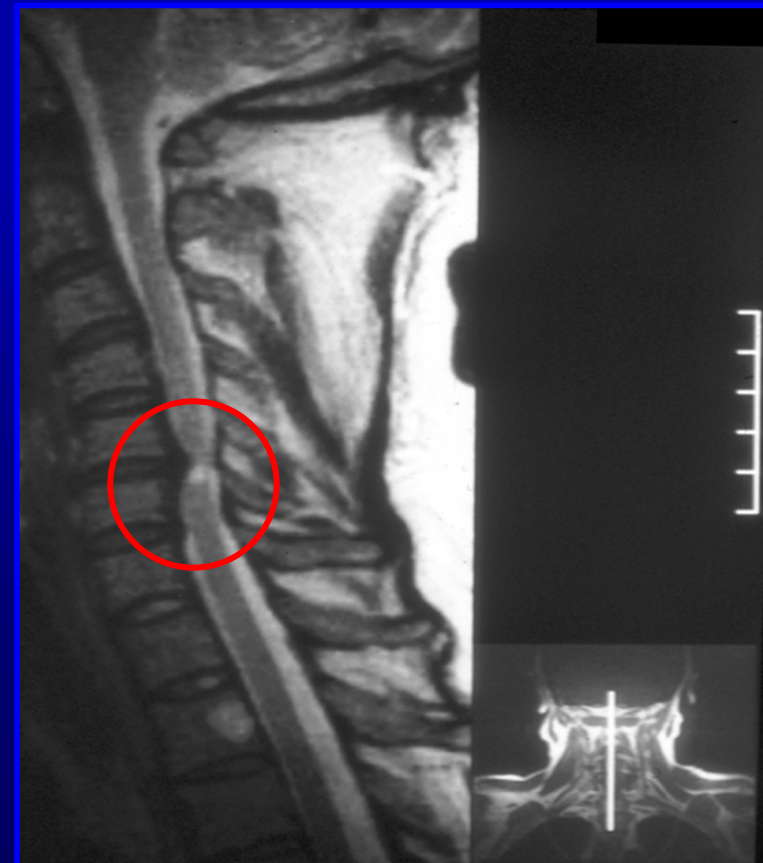
Anterior cord syndrome  
Central cord syndrome





# Acute cervical disc prolapse

33 yr male rugby player with acute tetraparesis following scrum collapse ( in front row but not a prop with contested scrum)



# Anterior Cervical Discectomy



# Tumours

If you are  
wondering the  
scale is cm not  
inches



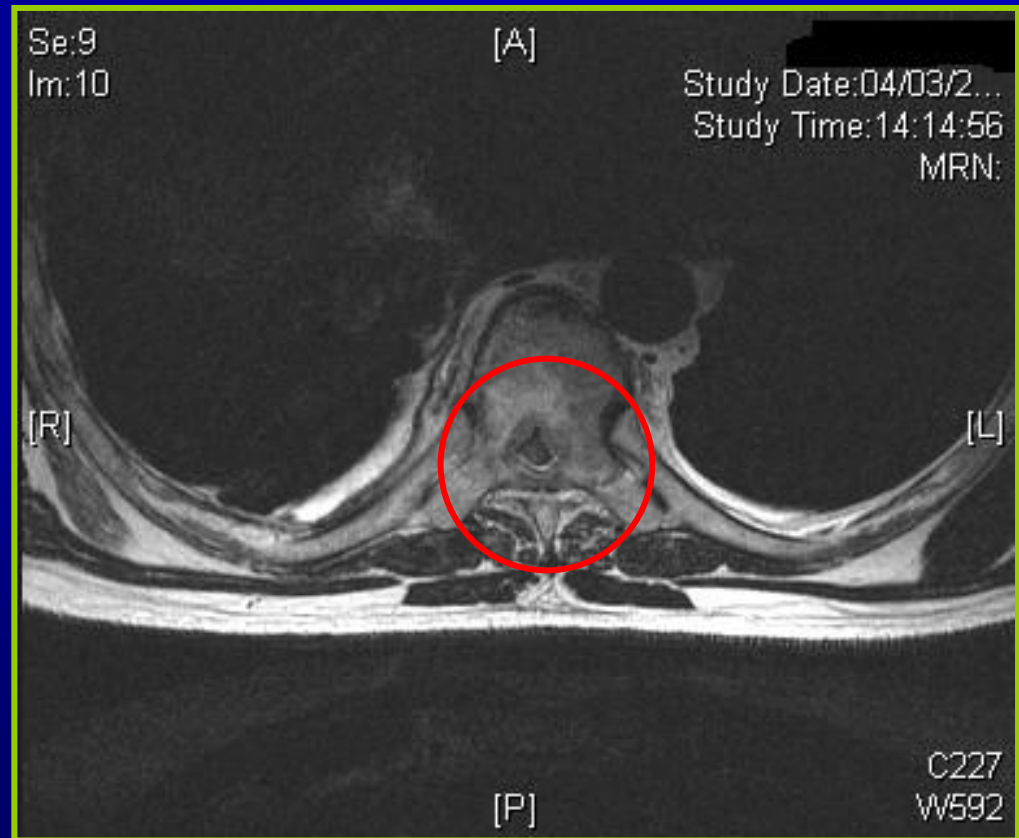
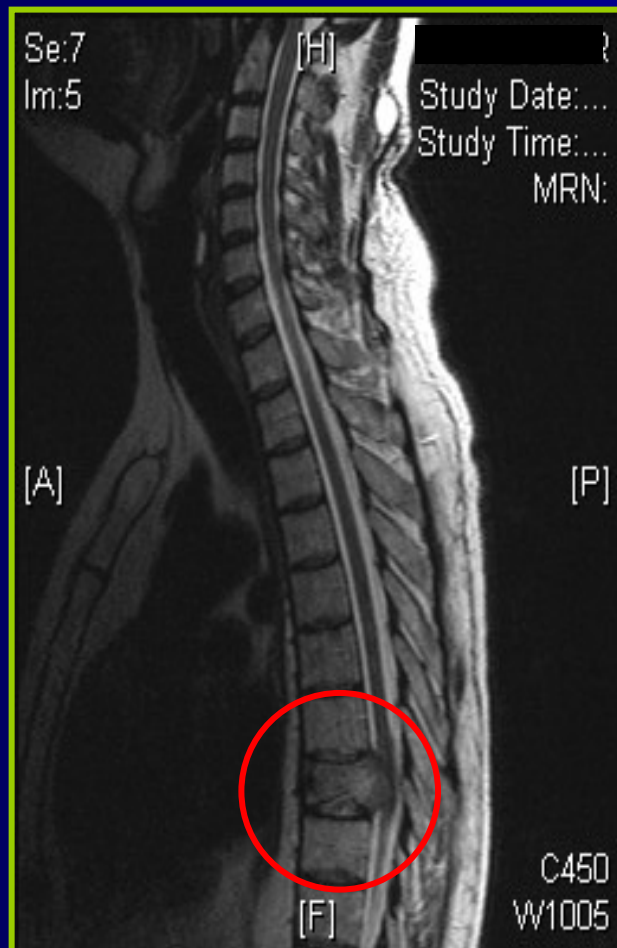
# Tumour - Metastasis

- Occur in 10% of cancer patients
- 5 - 10% cancer present with cord compression (the primary is often unknown)
- Pain is first symptom in 95% of pts
  - Localised, **radicular**
- 75% have neurological deficit at time of diagnosis
- Median time from symptoms to diagnosis is 2 months
- Referral is usually 4.59pm Friday night



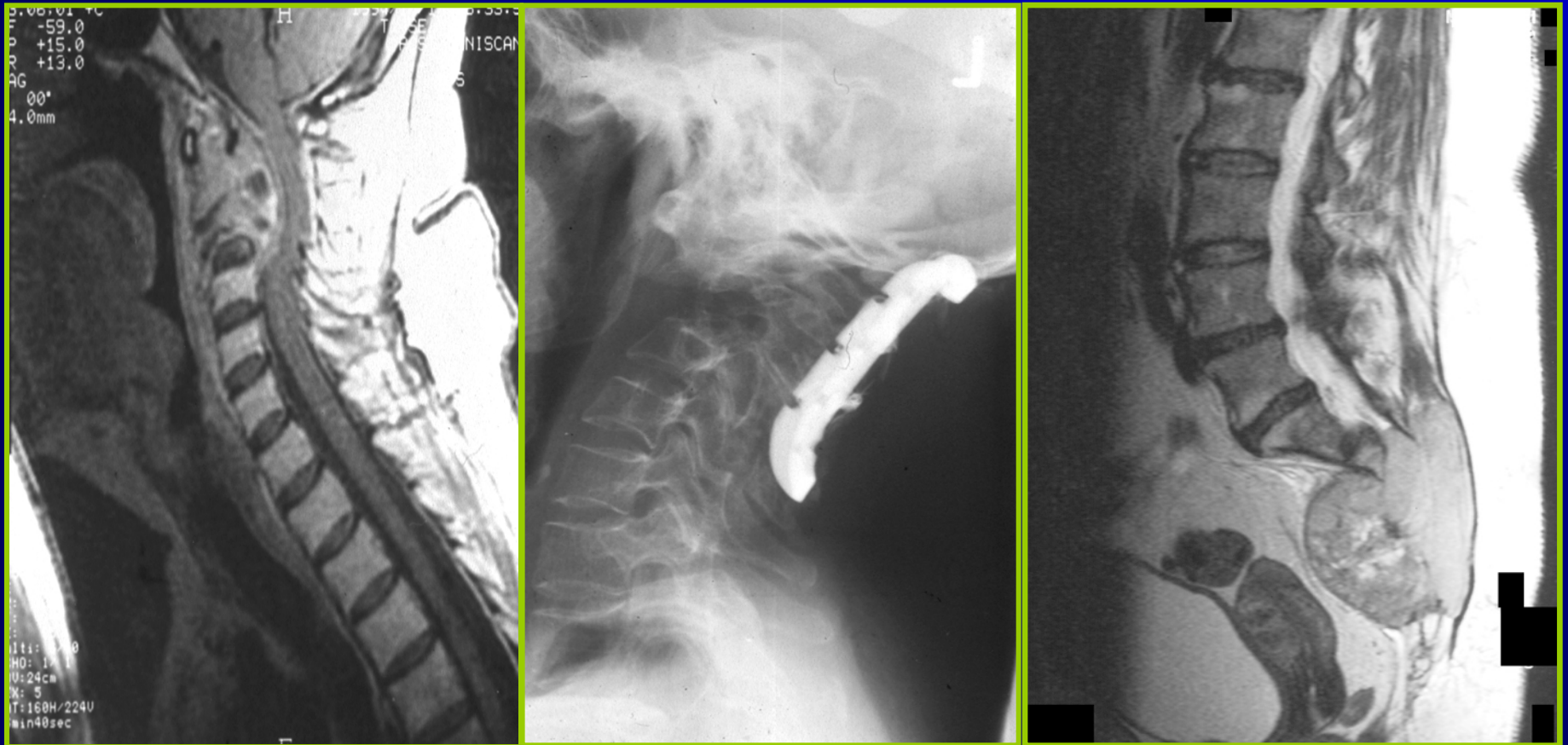
# MRI : Metastasis

Small cell carcinoma : 60 yr male with acute paraparesis with 8/52 history of back pain with radiation into abdomen



# Metastasis – can be anywhere

## Breast carcinoma





# Management

- Medical
  - Steroids
  - Radiotherapy : External beam, Cyberknife
  - Conservative



# Management

## Indications *to consider* surgery

Acute cord compression and functional deficit

Obtain tissue diagnosis

Radioresistant tumour

Neurological progression after DXT

### Contra – indications

Poor prognosis

Multilevel disease

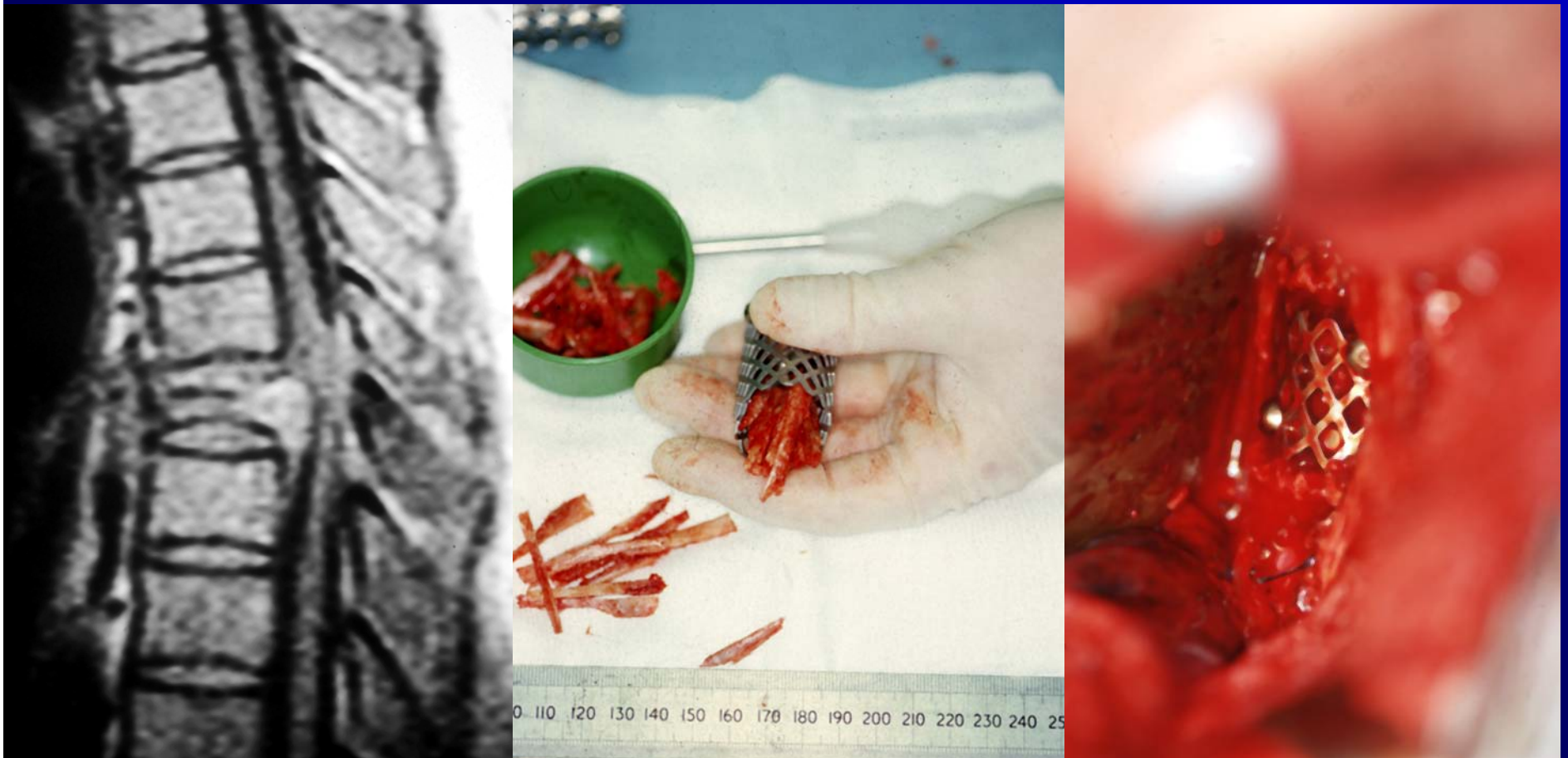
Paraplegia > 24 hrs

## Surgical options

- Decompressive laminectomy
- Vertebrectomy
- Decompression and instrumented stabilisation
- Preoperative embolisation
- ? Vertebroplasty

# Vertebrectomy

46 yr female with isolated breast metastasis with acute pain and cord compression



# Outcome

Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer : a randomised study

*Patchell RA et al. The Lancet 2005; 366 :643-48*

- Surgical decompression + / - fixation cf 30 Gy radiotherapy
- Entry criteria
  - Age > 18 years
  - Proven met with cord compression
  - **Single** lesion on MRI
- Exclusion criteria
  - Radiosensitive tumours, e.g., lymphoma, myeloma, germ cell
  - paraplegia > 48 hours
  - previous spinal irradiation
  - brain mets
  - survival < 3 months

# Outcome

## Surgery

- improves walking (122 vs 13days)
- improves continence (156 vs 13 days)
- improves Frankel score (functional ability)
- need less steroids and opioid analgesia
- live longer (126 vs 100 days) .....
- does not prolong hospital stay (median 10 days)

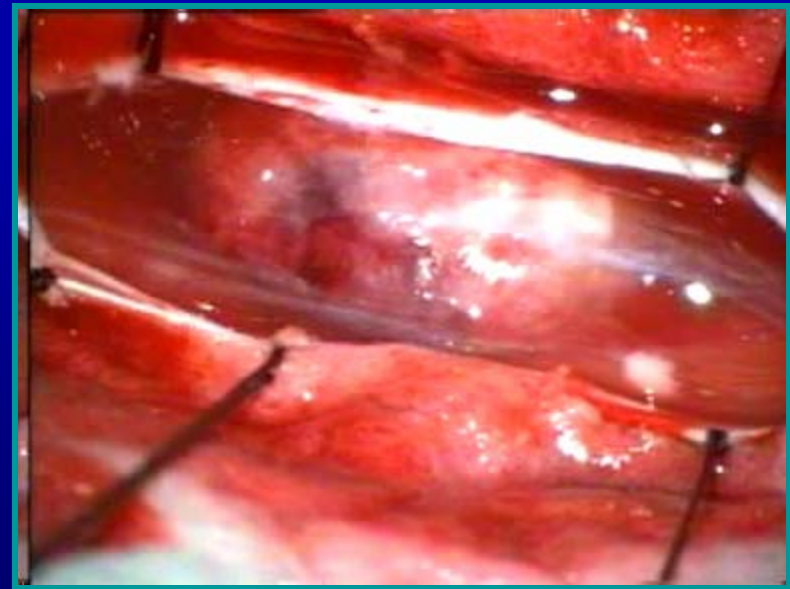


# Tumour - Primary

- Intradural, extramedullary
  - Schwannoma
  - Meningioma
- Intradural, intramedullary
  - Ependymoma
  - Astrocytoma

# Intradural Extramedullary Tumour : Neurofibroma

35 yr male with 18 / 12 persistent back and leg pain, with 48hr history of leg weakness and sacral anaesthesia



## Spinal intradural tumour : Neurofibroma

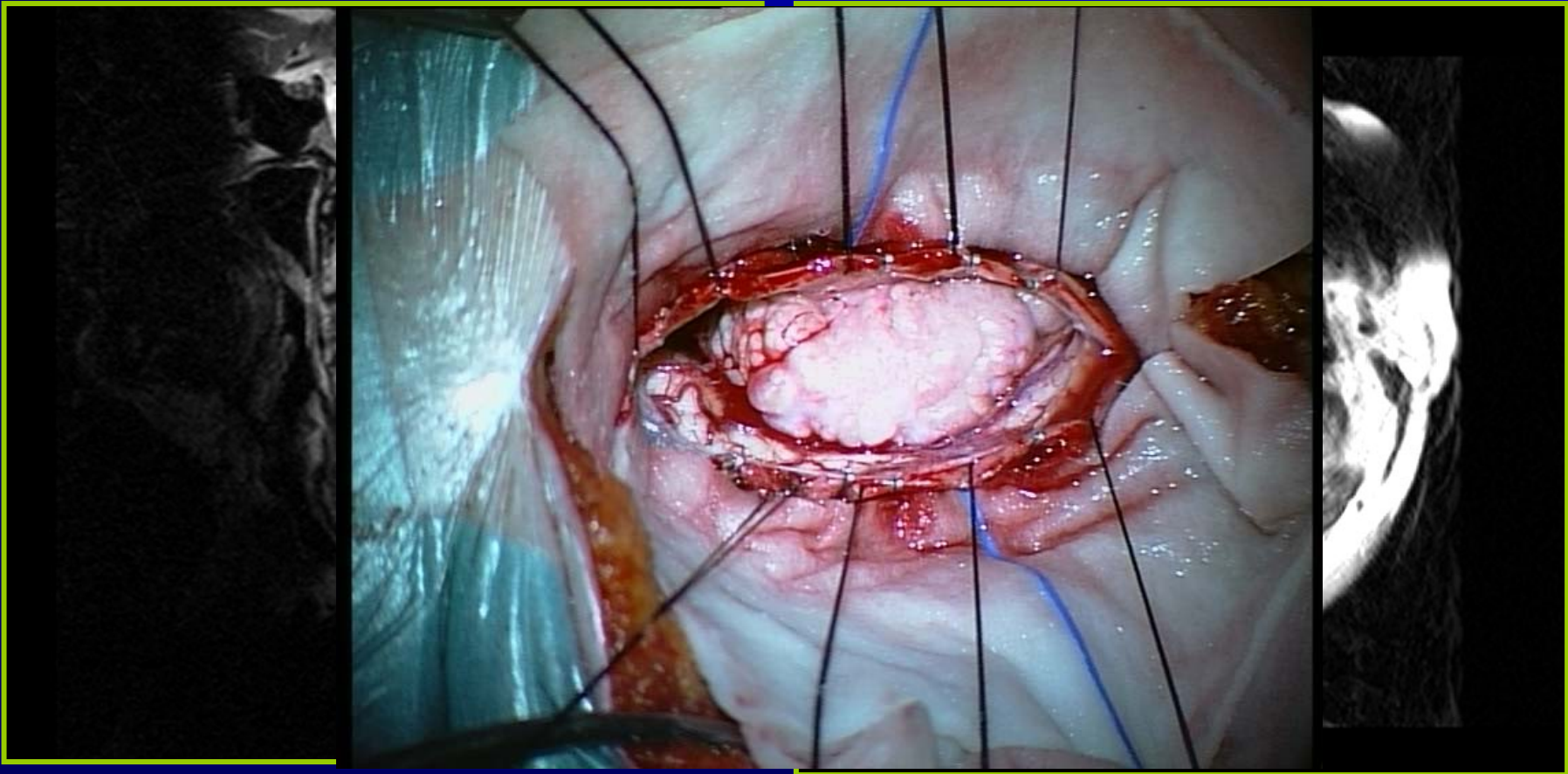
30 yr male with 12 / 12 history of arm pain  
and acute right arm and bilateral leg weakness



## CRANIO – CERVICAL MENINGIOMA

70 yr female with tetraparesis and dysphagia

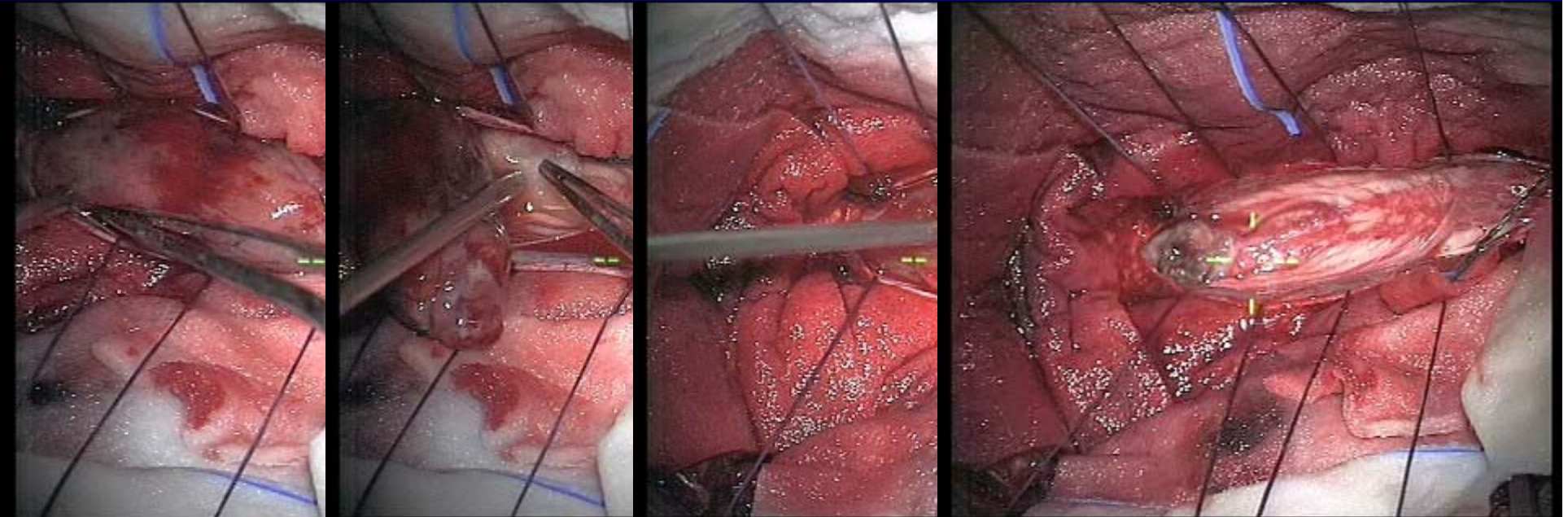
Delay in diagnosis until it became an acute problem





# Spinal intradural tumour : Ependymoma

30 yr male with 48hr of 'excruciating' back pain with background back ache



# INFECTION



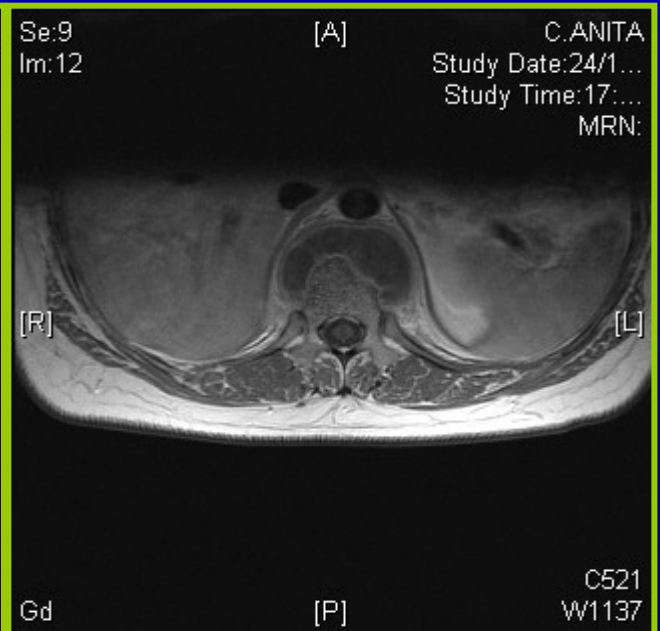
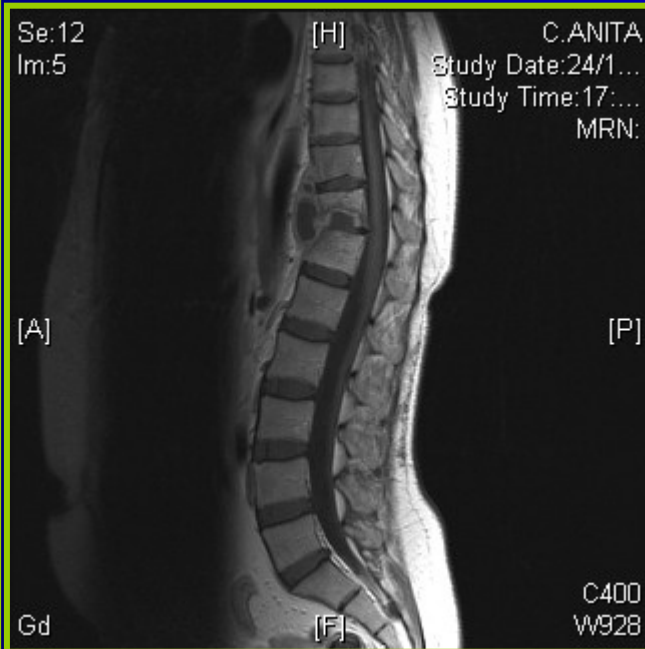
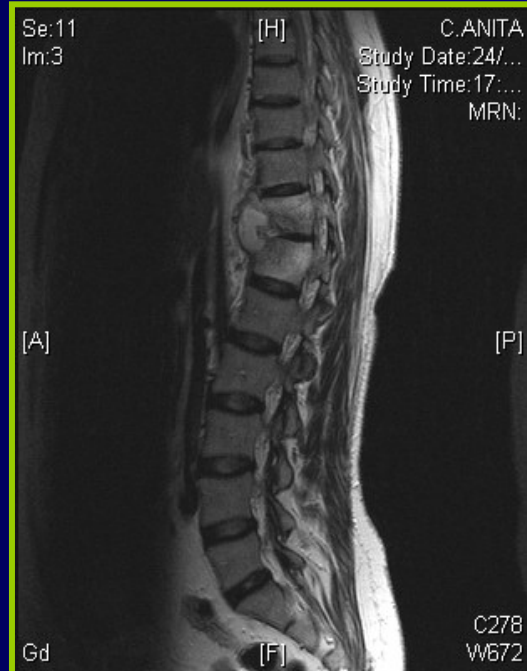


# Infection

- Vertebral body, disc space, epidural
  - Risk factors
    - Postop, IVDU, DM, haemodialysis, immunosuppression, endocarditis
  - Bacterial ( Staph, E.Coli, Salmonella ) / Mycobacterium
  - Clinical presentation : Pain ++, neurological symptoms, pyrexia
  - Imaging – XRay, MRI, CT ( for Bx )
  - Diagnosis – CT Guided Bx ( 50% pos ), MC+S, AAFB, Gram stain
- Treatment
- Urgent decompression if cord compression ( esp. bacterial abscess)
  - Appropriate antibiotics
    - Length of time – ask the microbiologists ( and add or subtract 3 months depending on answer! )
    - Monitor inflammatory markers
    - If no response consider diagnosis – tissue and bacteriological, ?pt taking treatment
    - Response to treatment - CRP, ESR
  - Surveillance imaging
    - Deformity

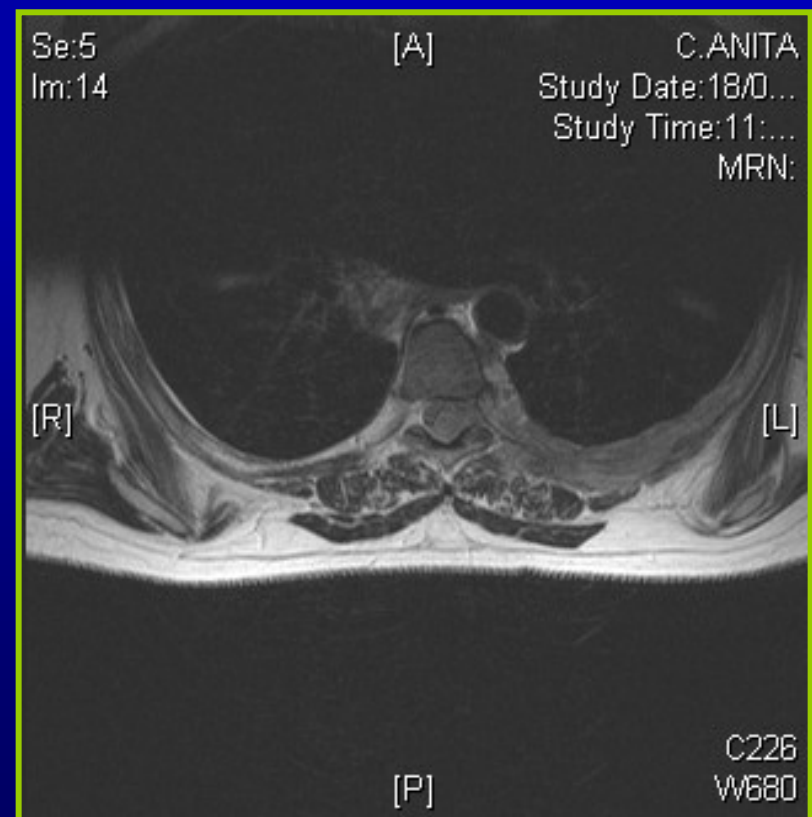
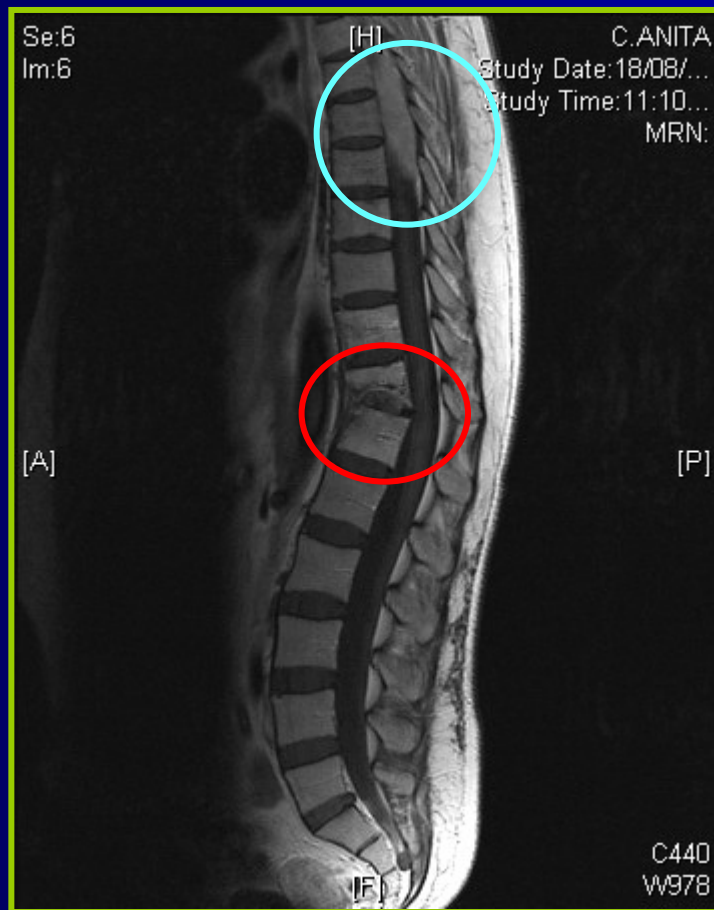
# Spinal TB

43 yr female typical mechanical low back ache : Microcytic anaemia and local tenderness



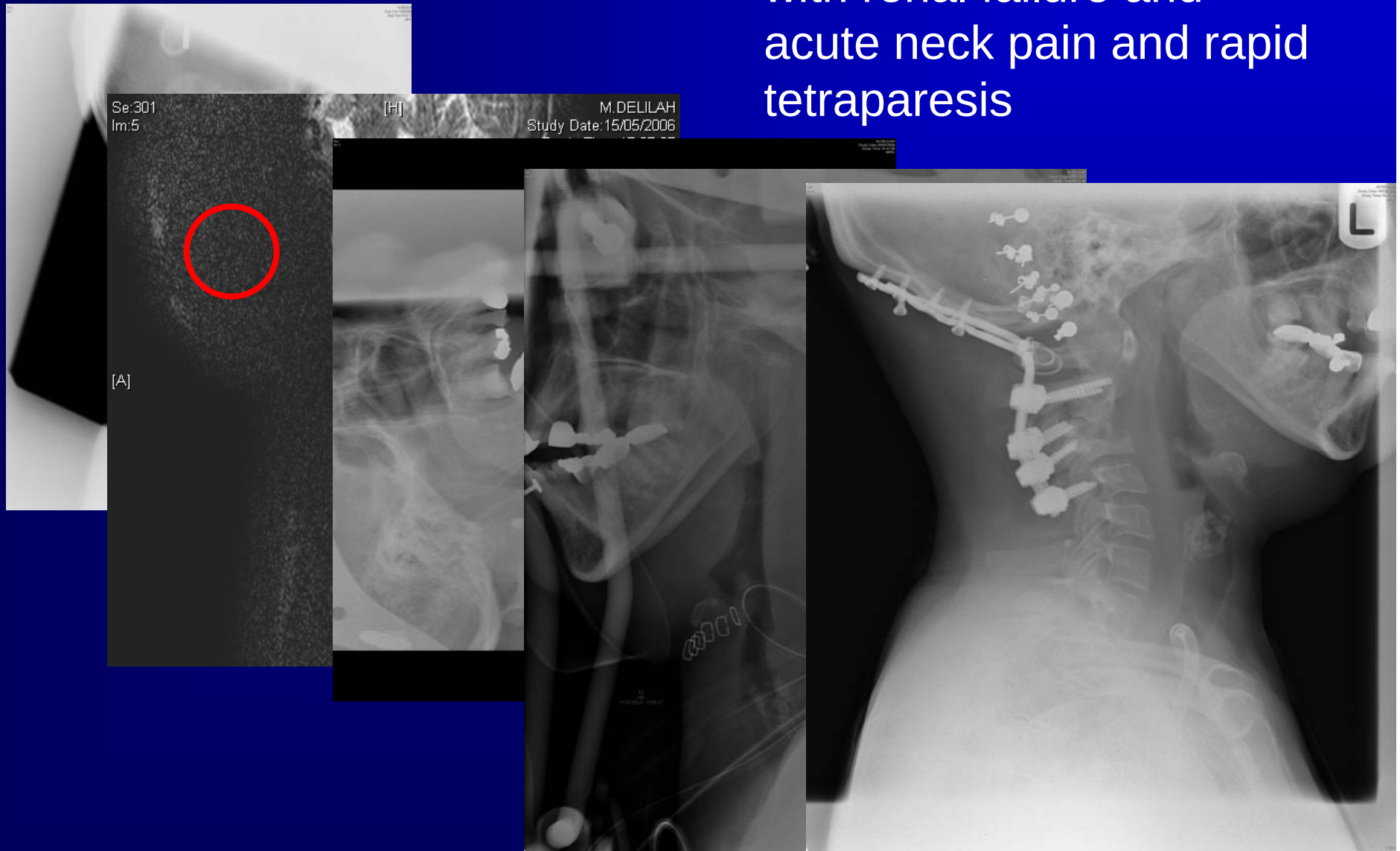
# BEWARE DUAL PATHOLOGY !

## TB AND B CELL LYMPHOMA



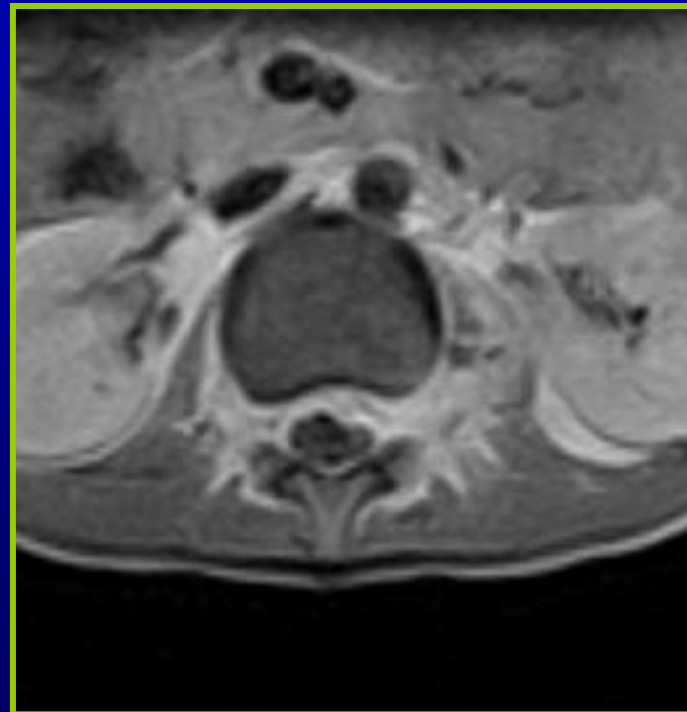
## Bacterial Discitis

34 yr female on steroids  
with renal failure and  
acute neck pain and rapid  
tetraparesis



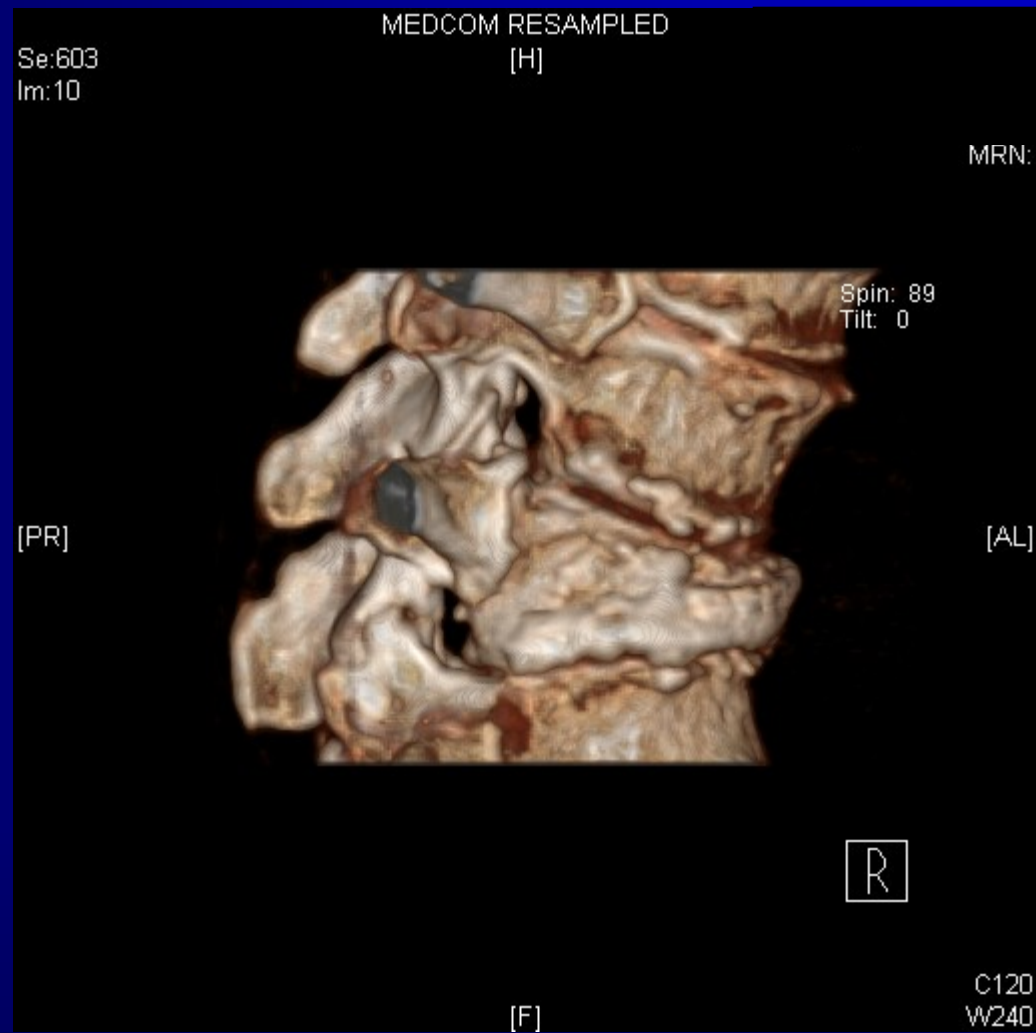
# Epidural Abscess

35 yr male HIV, IV drug abuser with acute back and leg pain, leg weakness and sensory loss

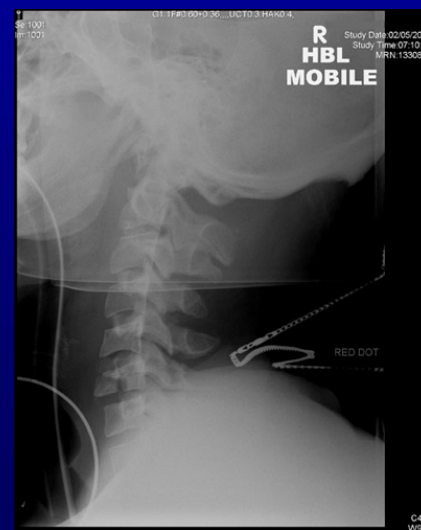
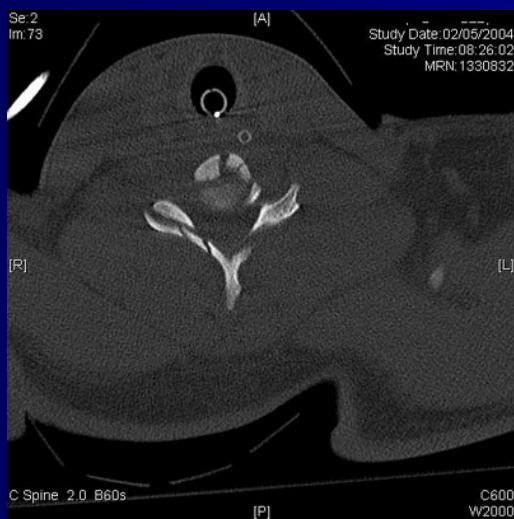




# Trauma

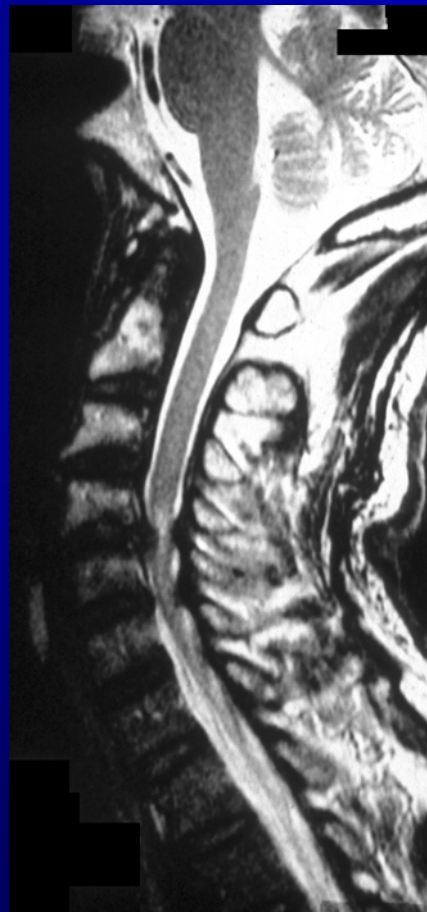


# Cervical Spine Injury

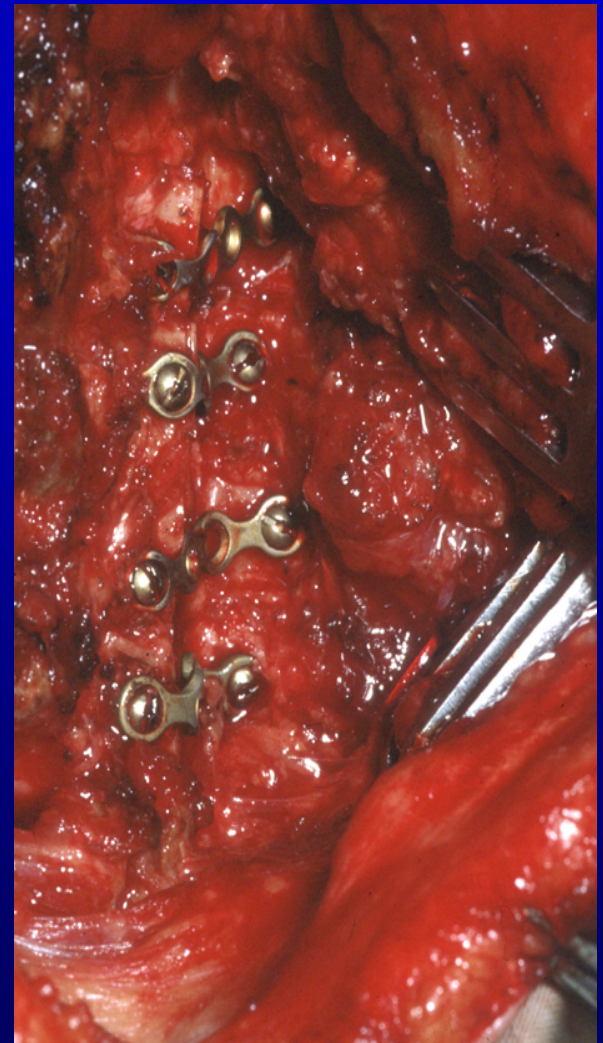


# Central Cord Injury

80 yr male hyperextension injury after fall



Cervical laminoplasty



# Trauma - Penetrating

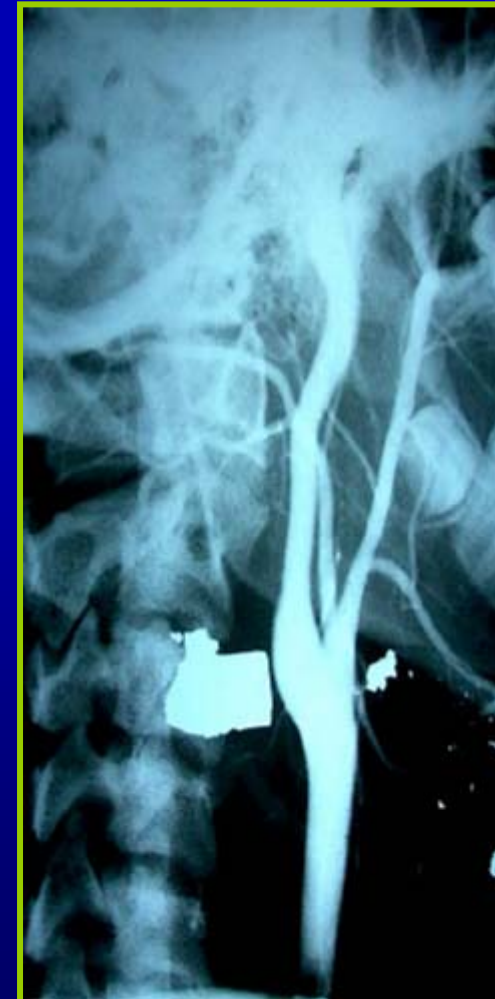
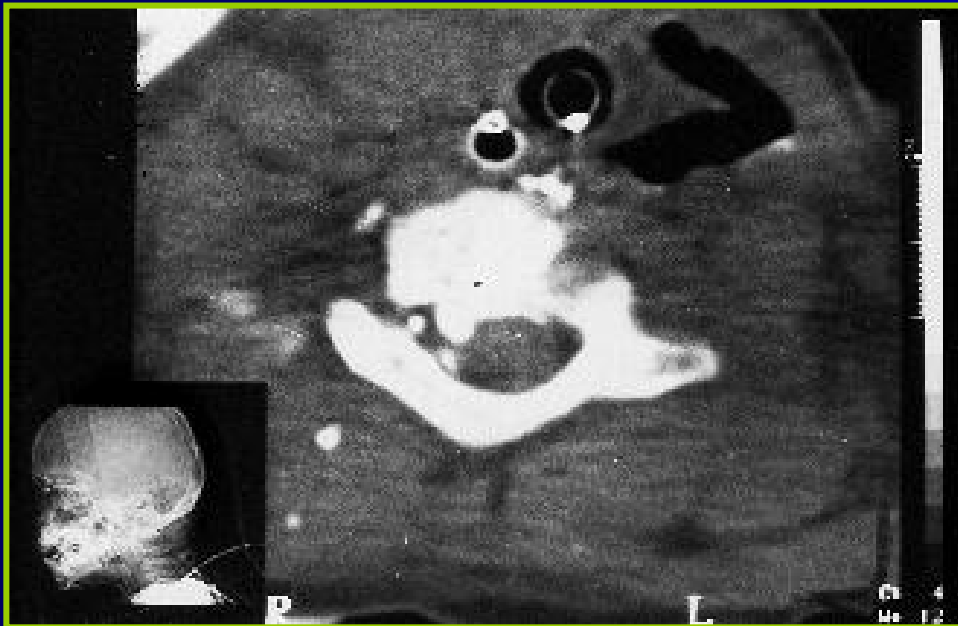
- Gunshot wounds
  - mostly handguns
  - thoracic > cervical > lumbar
  - instability is rare
- Knife wounds
  - increasingly common
  - consider vascular and other organ injury
  - Brown – Sequard syndrome due to cord hemisection

Contralateral : dissociated sensory loss, loss of pain and temperature (1-2 segments below) preserved light touch

Ipsilateral : loss of posterior column, motor paralysis



## Penetrating bullet wound to cervical spine



### Management

? Value of decompression

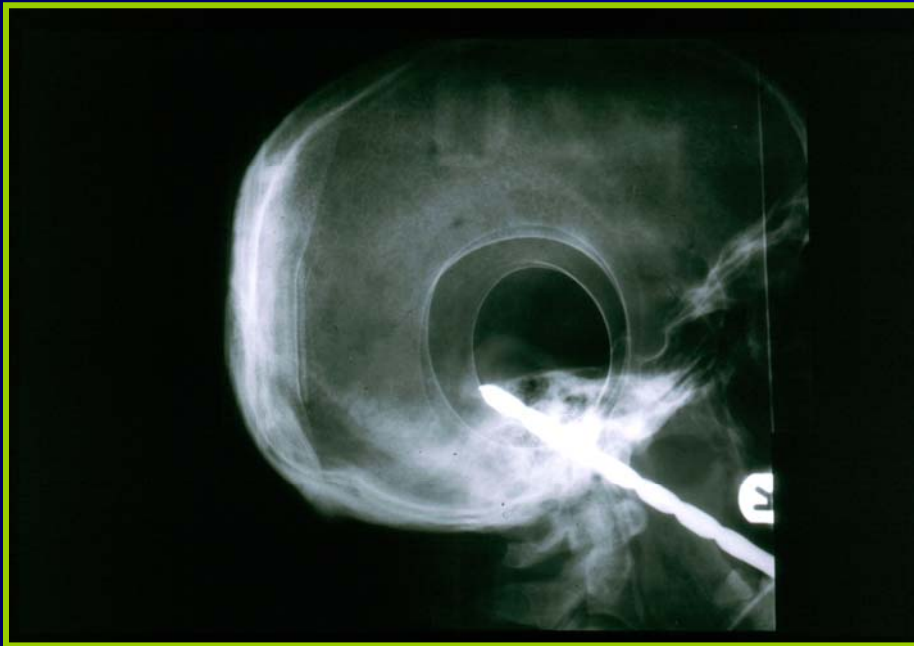
Wound debridement and drainage

CSF leak may need Lx drain



# Trauma - Penetrating

There are somethings that cannot be treated.....

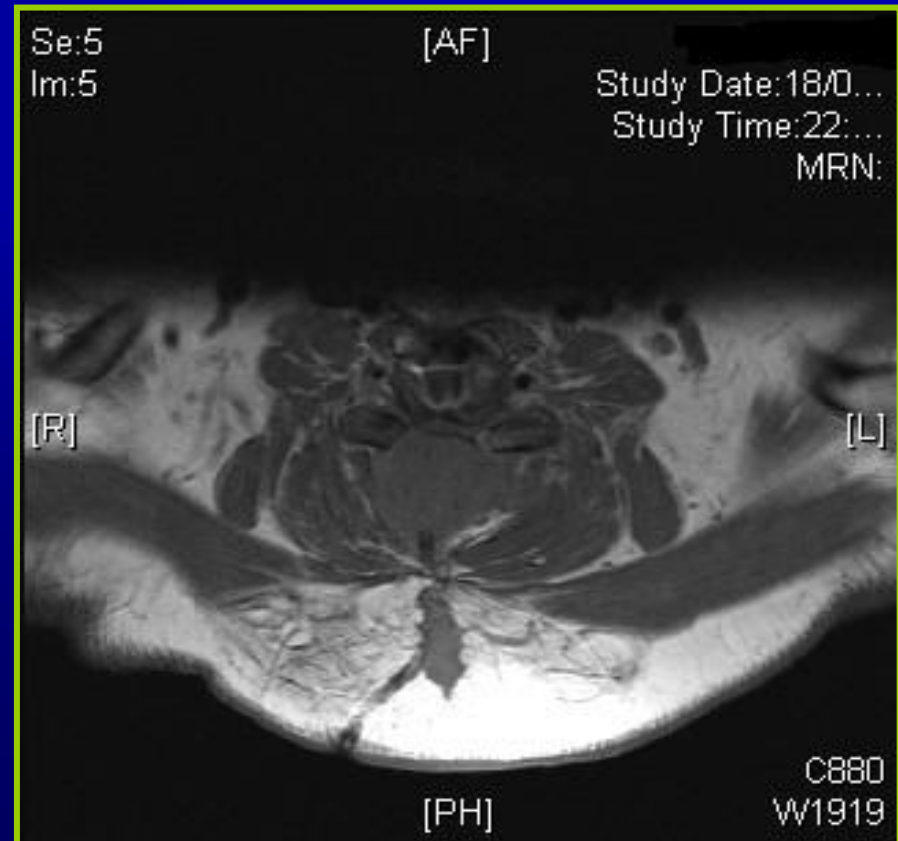


# Epidural Haematoma

- > 30% associated anticoagulation
- Traumatic
  - LP, epidural anaesthesia, surgery
- Spontaneous (rare)
  - AVM, vertebral haemangioma
- MRI
  - Hypointense T1
  - Hyperintense T2

## Epidural Haematoma

50yr female with Cx Myelopathy, prev ACDF, Cx Laminectomy. 2 hours post op tetraparetic ( on aspirin )



Thank you