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**
  - Syrinx / Chiari malformation
Cauda Equina Syndrome

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

William Mixter
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
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.


‘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


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
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 13 days)
– 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.
70 yr female with tetraparesis and dysphagia

Delay in diagnosis until it became an acute problem
Spinal intradural tumour: Ependymoma

30 yr male with 48 hr of ‘excruciating’ back pain with background back ache
INFECTION
Infection

- Vertebral body, disc space, epidural
- Risk factors
  - Postop, IVDU, DM, haemodialysis, immunosupression, 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