### **Paraparesis**

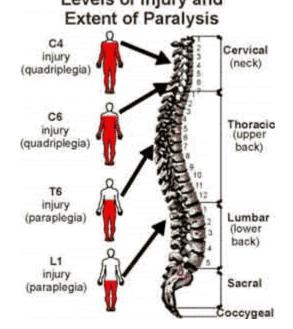
**Differential Diagnosis** 

Ran brauner, Tel Aviv university

#### Definition

Loss of motor power to both legs

 Paraparesis (paraplegia) refers to partial (paresis) or complete (-plegia) loss of voluntary motor function in the pelvic limbs



#### Non-traumatic

- Syndromes that were not obviously caused by harmful external event (injury)
- Less common
- Unspecific neurological symptoms my dominate that may hinder correct diagnosis
  - Partial paresis
  - Motor / sensory
  - Control over bladder and rectum

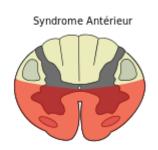
#### First differentiation

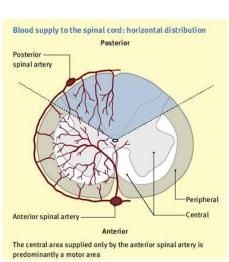
1. Acute onset Vs Subacute

2. Spastic Vs Flaccidic

### Ischemic spinal cord lesions

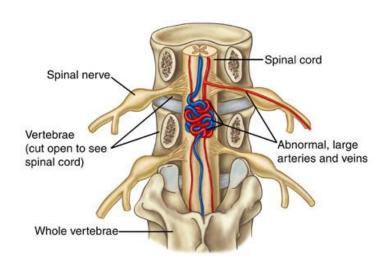
- Anterior spinal artery syndrome
- Acute onset
- Flaccid paraparesis progress to spastic
- Loss of pain and temperature sensation
- Primary: atherosclerosis, Lupus, sjorgen
- Secondary: compression (tumor, disc prolapse), aortic dissection
- Decompression sickness





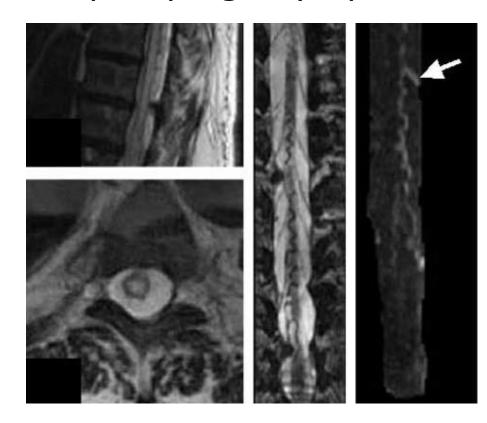
# Spinal hemorrhage and vascular malformation

- Spinal hemorrhage->
  - spinal hematoma
  - Subarachnoid hemorrhage
  - Parenchymal hemorrhage
- Acute onset + Flaccid
- Trauma + hemophilia or spontaneously
- Could by arteriovenus malformation
- Clinically undistinguished from ischemic=>
  MRI



# Spinal hemorrhage and vascular malformation

- Spinal fistula or intramedullary AVM
- Slowly progressive paraplegic symptoms
- Rare



# Acute Inflammatory spinal cord disorders

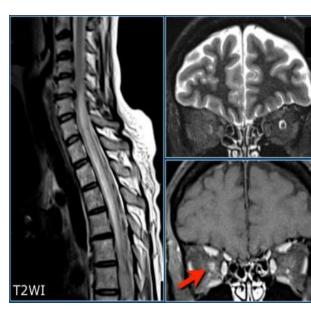
#### Acute transverse myelitis

- Acute segmental spinal cord injury
- Could by infectious process
- Immunologically mediated (NMO)
- post viral or post vaccination (ADEM)
- Spinal cord compression should by ruled out
- The initial symptoms are paresthesia,
  back pain, and weakness of the legs
- risk of MS of 2% 5%



# Acute Inflammatory spinal cord disorders

- Neuromyelitis optica Devic's disease
- simultaneous inflammation and demyelination of the optic nerve (<u>optic</u> <u>neuritis</u>) and the spinal cord (<u>myelitis</u>)
  - Optic neuritis: visual impairment
  - Acute myelitis: severe spastic weakness of the legs
- resembles multiple sclerosis
- antibodies against AQP4
- Associated with collagen vascular diseases, autoantibody syndromes, infections with varicella-zoster virus, Epstein-Barr virus, and HIV



### Acute infectious spinal cord disorders

- Tropical Spastic Paraparesis (HTLV-1)
  - progressive spastic paraparesis
- Herpesviruses radiculomyelopathy
- Poliomyelitis asymmetric weakness
- West Nile virus asymmetric or ascending
- Syphilis meningovasculitis infraction
- AIDS vacuolar myelopathy (progressive symptoms)
- Tuberculosis pott disease (vertebral) with secondary compression of cord



# Chronic inflammatory disorder of the CNS

- Multiple sclerosis
  - Lower extremity weakness can be initial symptom
  - Acute or gradually progressive spastic paraparesis
- Motor neuron diseases:
  - Amyotrophic lateral sclerosis (ALS):
    - rapidly progressive weakness with limb onset
- Systemic diseases such as Behçet's disease
  - Usually flaccid paralysis or incomplete paraplegic symptoms

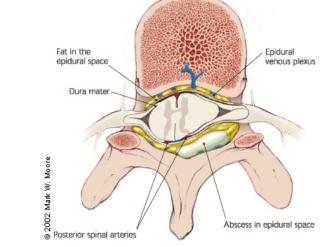
# Space occupying inflammatory disorders – infectious

- Epidural abscess or Spondylodiscitis
- neurological emergency!

Skin infection, LP, back trauma, vertebral osteomvelitis or

hamatogeneic spread (I.V drug abuse, DM)

- Progressing Symptoms:
  - > Fever, backache, headache and malaise
  - > rapidly progressive paraparesis
  - > sensory disturbances
  - > loss control of bladder



Spondylodiscitis may be clinically silent until paraplegic symptoms develop

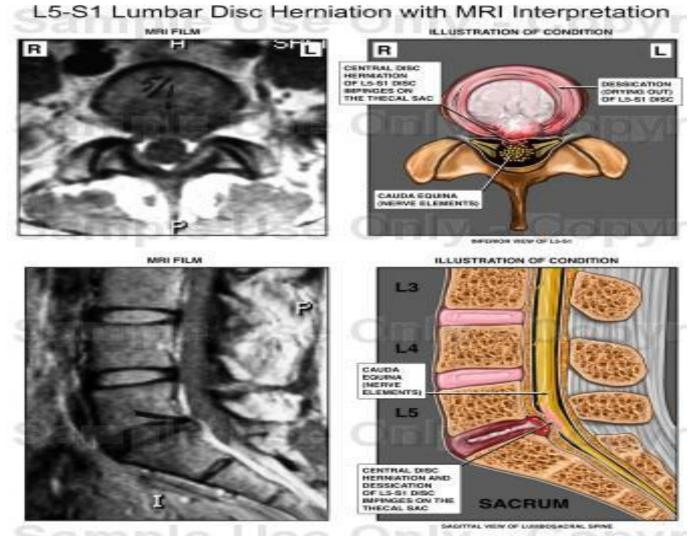
# Non-inflammatory spinal space occupying lesions

 Slowly progressing or fast growing tumors(metastases or secondary vertebral fracture)

Secondary spinal cord ischemia or compression of spinal vessels

Sub acute or Acute (respectively)

- Also in median disc prolapse->
  - Local back pain followed by acute paraparesis (flaccid), impaired sensation and loss control of bladder/rectum

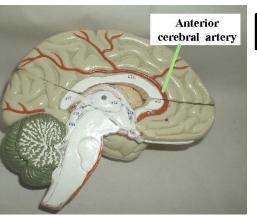


### Hereditary spastic paraplegia (HSP)

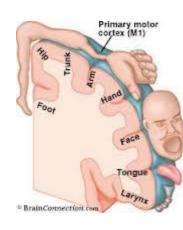
- group of clinically and genetically diverse disorders
- lower extremity weakness and spasticity
  - defects in the mechanisms that transport proteins and other substances through the cell

### Non spinal disorders

- Disorders not primarily affect the cord but symptoms create false impression
- Guillain-Barré syndrome:
  - Acute, ascending flaccid pareses
  - Impaired sensitivity and Areflexia
- Acquired hypo/hyperkalemic paralysis
  - Acute or subacute flaccid paraparesis and areflexia. No sensory impairment



### Non spinal disorders



 Bilateral ischemia of the anterior cerebral arteries can mimic acute paraplegic symptoms

- Psychogenic parparesis
  - Acute onset
  - Reflexes and muscle tone remain normal

#### **Leading symptom** Acute or subacute neurological deficit, consistent with damage to cervical spine, thoracic spine, or conus-cauda area (i.e. motor and/or sensory deficits in both arms and/or legs, impaired function of bladder/rectum History and physical investigation Confirmation of paraplegic syndrome, distinction from non-spinal disorder Targeted search for signs of infection, systemic disease, vascular risk factors, and generalized atherosclerosis, tumor, accident Elicit information about preceding infection or vaccination **First priority** Exclusion of spinal cord compression Spinal magnetic resonance scan with administration of contrast medium within 4 hours Urgent presentation to (neuro)surgeon Spinal cord compression with damage Maybe intravenous administration to myelon Yes of methyl prednisolone No Second priority Exclusion or confirmation of imflammatory spinal cord disorder Lumbar puncture Non-inflammatory spinal cord damage likely, e.g.: Spinal cord ischemia Cerebrospinal fluid pleocytosis or contrastmedium enhancement in magnetic resonance Arteriovenous malformation imaging or increased IgG index Caution: In the early stages of an inflammatory spinal cord disorder, cerebrospinal fluid may still be inconspicuous, hence control after 2-7 days Third priority Search for multiple demyelinations Magnetic resonance scan of the skull, evoked potentials Possible diagnoses Multiple sclerosis and special forms Multiple demyelinations Neuroborreliosis Yes

Acute transverse myelitis

Vasculitis

#### reference

- Schwenkreis, P., et al. Non-traumatic acute transverse spinal cord syndromes. Praxis (Bern 1994). 2005 Jul 27;94(30-31):1151-9.
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- WIKIPEDIA