The University of Jordan

School of Medicine

Lectures in Pictures

Spinal Cord Injuries

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CHRISTOPHER REEVE. ... **Superman was** 42 and has enjoyed a prolific screen and stage career, was thrown from his horse and landed on his head.He sustained a cervical fracture which rendered him paralyzed for the rest of his life.

Epidemiology:

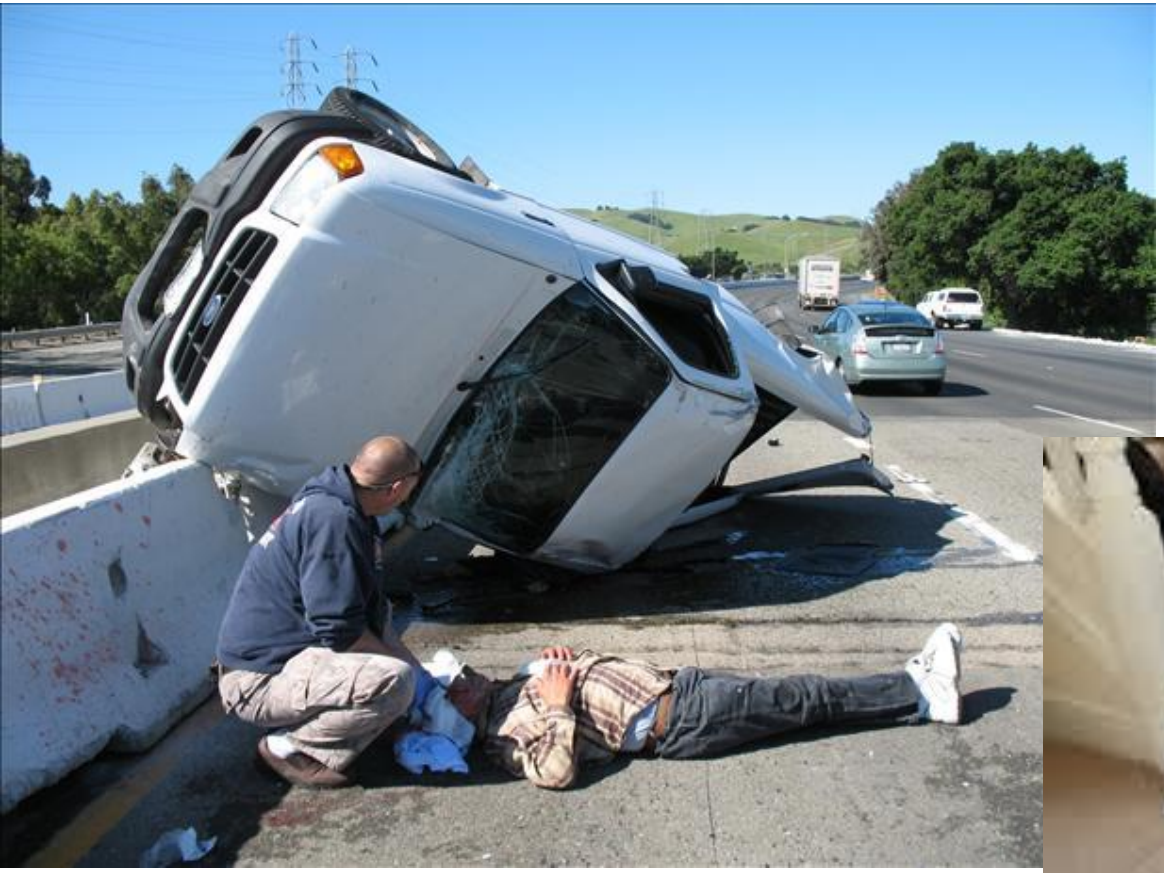
- **Sex:** male-to-female is 4:1
- **Age:** 60% in people aged 15-25 years.

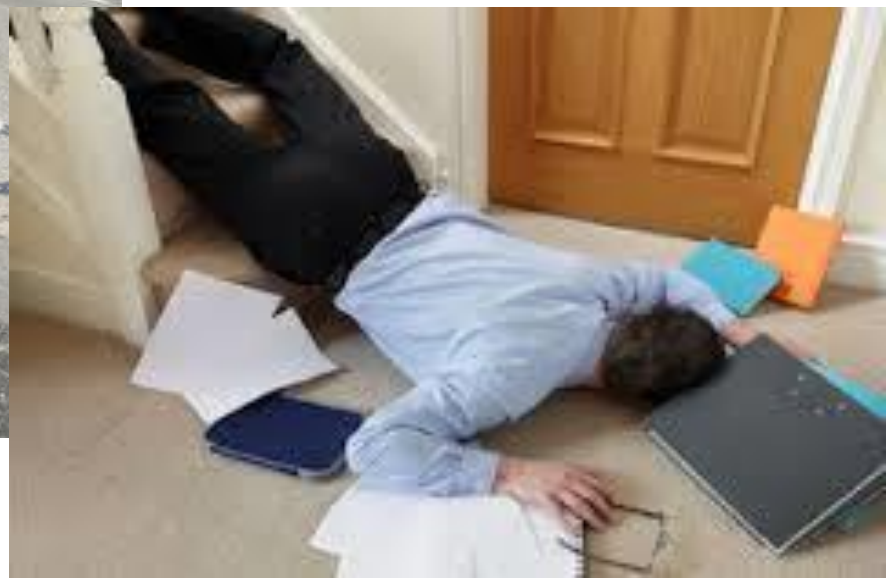
- Head injury:5-15% have spinal injury.
- Spinal injury: 5% have head injury.
- Distribution :
  - 55% cervical
  - 15% thoracic(1/3 each)
  - 15% thoracolumbar junctio
  - 15% lumbar
- Injuries above clavicle:15% have C.spine injury.
- 5-15% of C.spine fractures have second vertbral column fracture.
- Slightly >50% of cervical spine trauma have neurologic injury.

C4 and above injury = phrenic N. injury causing respiratory depression

Etiology:

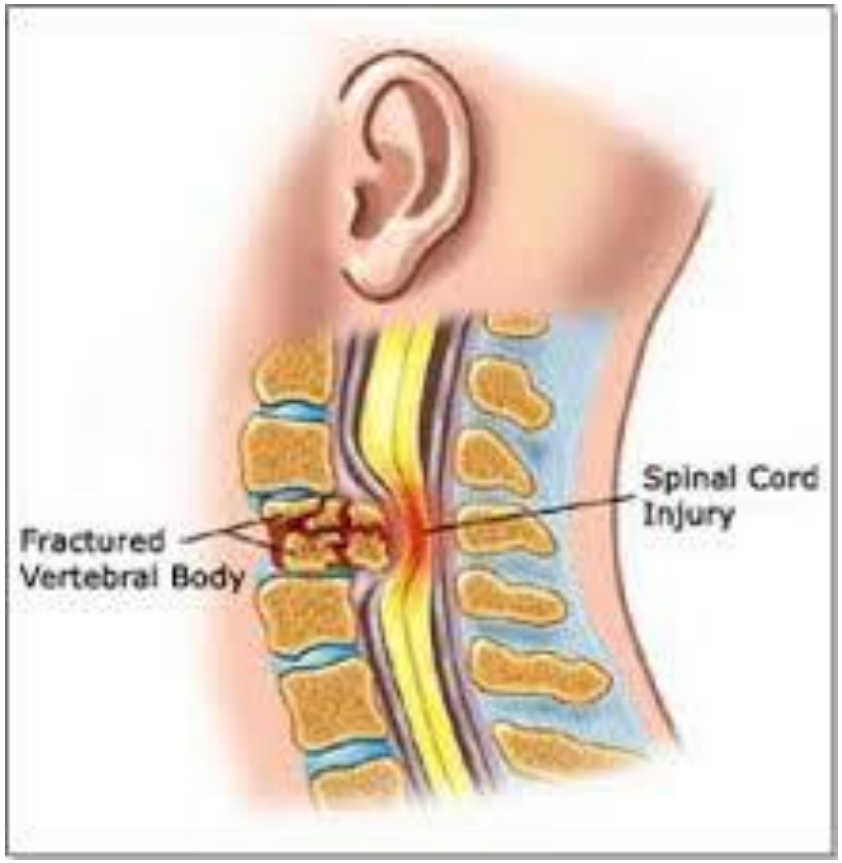
RTA
Sports
Falling Down
Assaults





Anatomy:

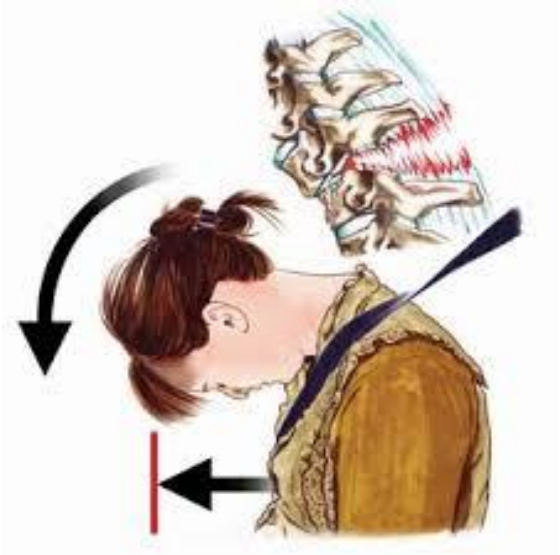
- Spine
  - Bony components
    - Fracture vertebra
    - Dislocations
    - Ligamentous injury
  - Spinal cord
    - Complete
    - incomplete



Pathophysiologyof spinal cord injury

- traction and compression forces.
- Loss of auto regulation
- spinal shock
- ischemia.

Mechanism of injury



1. ***Hyperflexion***
2. ***Hyperextension***
3. ***Axial loading Direct trauma***
4. ***Penetrating injuries***

Clinical syndromes of SCI:

A. Complete spinal cord transection syndrome:

complete loss of sensory, motor, and sphincters

- The classic syndrome of quadriplegia with upper and lower extremity areflexia; anesthesia below the affected level.
- Neurogenic shock (ie, hypothermia and hypotension without compensatory tachycardia);
- Loss of rectal and bladder sphincter tone.
- Respiratory insufficiency ??
- Spinal shock.

above C4
Phrenic maybe intact

B .Incomplete Spinal Cord Injuries

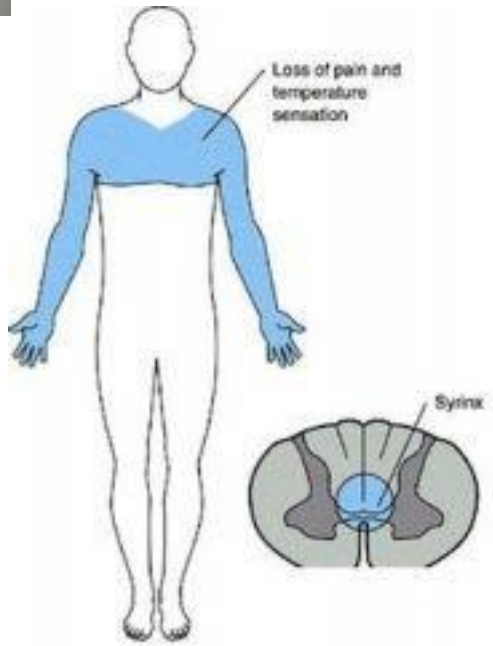
1.central cord syndrome:

Most common

- caused by severe neck hyperextension.
- more arm weakness than leg weakness
- variable sensory deficits
- mostly pain and temperature

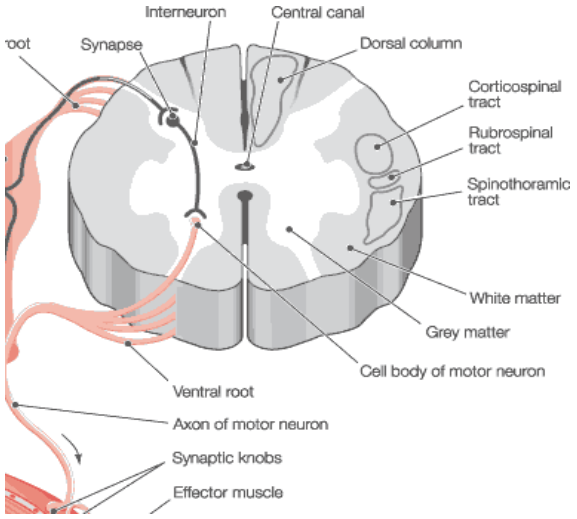
(*because the lateral spinothalamic tract fibers cross just ventral to the central canal)*

- This is sometimes referred to as
  - *dissociated sensory loss*
  - present in a **cape** like distribution.



2.Anterior cord syndrome:

The anterior cord syndrome is typically observed with anterior spinal artery infarction and results in paralysis with loss of pain and temperature sensation below the level of the lesion and relative sparing of touch, vibration, and proprioception



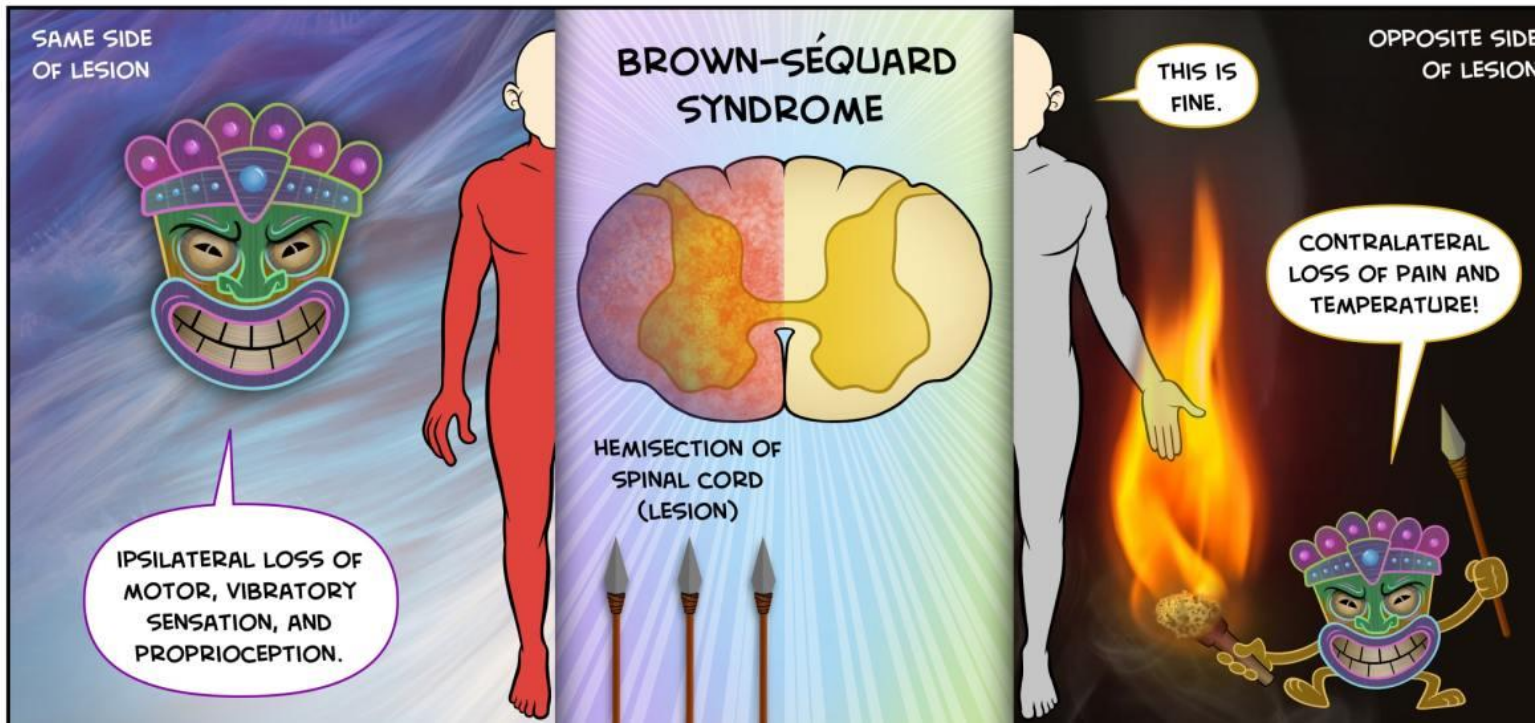
Causes: trauma, disc prolapes

Brown-Séquard syndrome

Hemi trans section of S.C

- **Ipsilateral** :paralysis, loss of vibration and position sense below the level of the lesion.

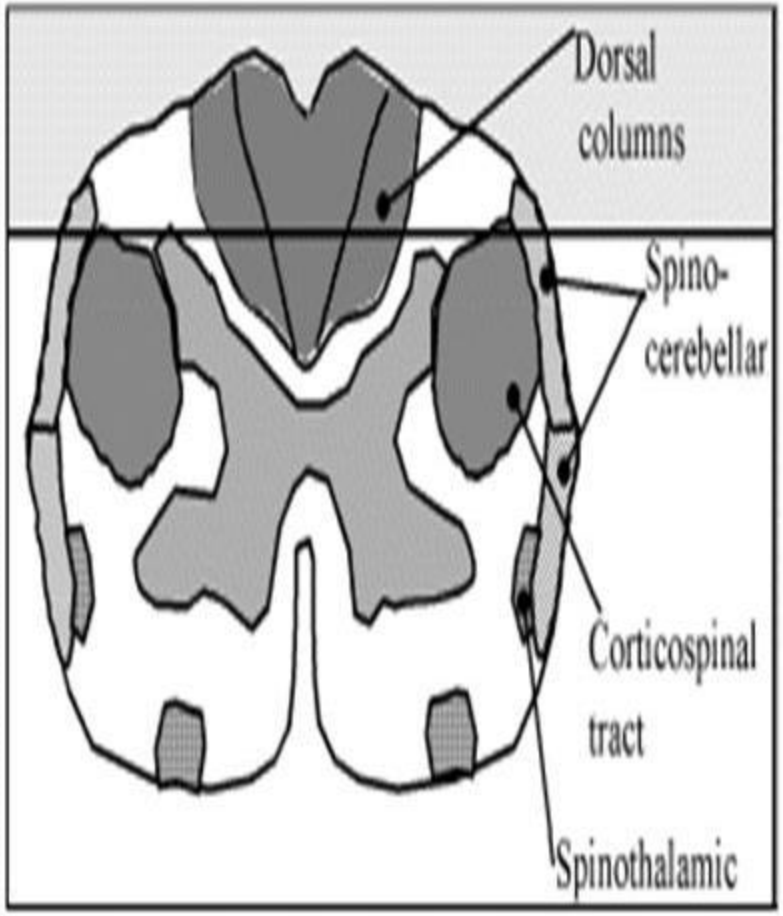
Contra lateral *:loss of pain and temperature sensation occurs below the level of the lesion.*



Posterior Cord Syndrome

DDx: vitamin B12 deficiency

- Least frequent syndrome
- Injury to the posterior (dorsal) columns
- Loss of proprioception
- Pain, temperature, sensation and motor function below the level of the lesion remain intact
- Proprioception affected – ataxia and faltering gait
- Usually good power and sensation



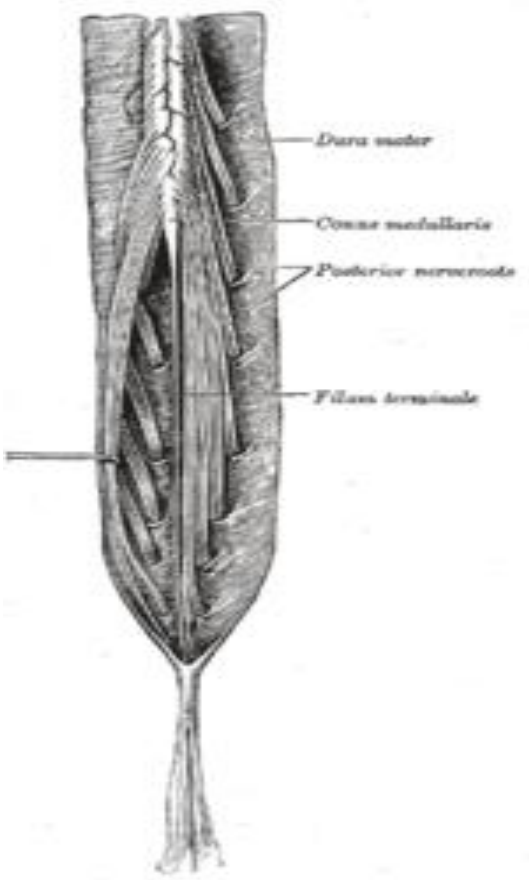
Management in the field:

1. Immobilization : **m.i** cervical spine
2. Maintain blood pressure.
3. Maintain oxygenation.
4. Brief motor examination

Maintain active bleeding
Awake? immobilize, Unconscious might need CPR

Cauda equina and conus medullaris syndromes:

- Patients with lesions affecting only the cauda equina can present with a polyradiculopathy with pain, radicular sensory changes, asymmetric lower motor neuron–type leg weakness, and sphincter disturbances.
- Lesions affecting only the conus medullaris cause early disturbance of bowel/bladder function.



Cauda equina = below L1/L2

Equina starts with pain then bladder Sx, opposite in conus

In hospital acute Management :

Including:

- Immobilization.
- Systemic measures.(CVS,respiratory,GIT,bladder and tempreture)
- Detailed neuro evaluation.
- Radiological evaluation.
- Steroids..

Most important: thorax
Airway > bleeding > ...

**Remember:5-10% get worse after arriving the E/R;*

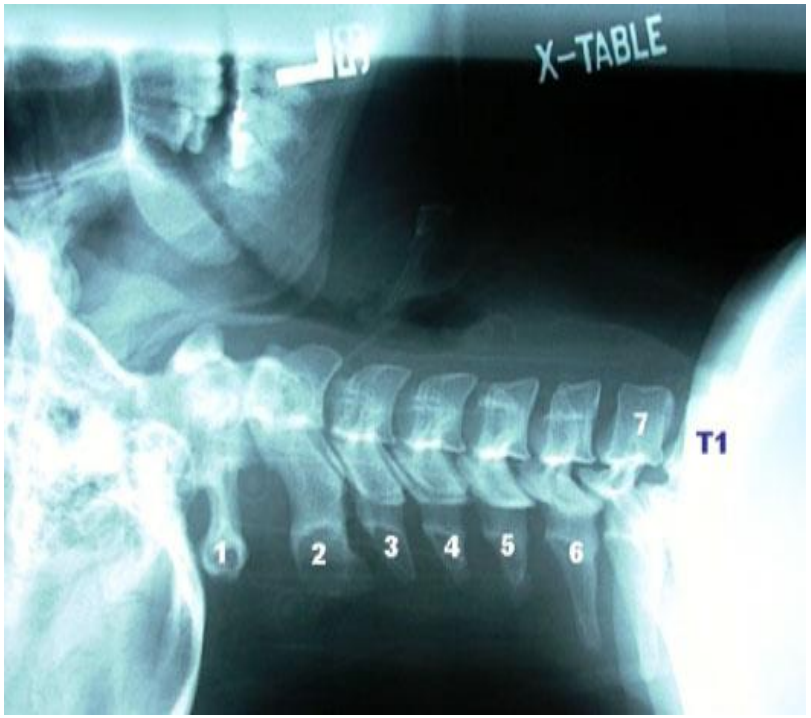
? edema

? ischemia

? inadequate immobilization

X-ray:

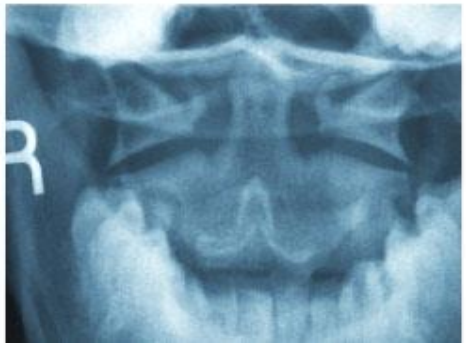
- Cross-table X-ray:85% sensitive.



X-RAY:

- AP/Lat.:92% sensitivity.

For any fracture or dilocation

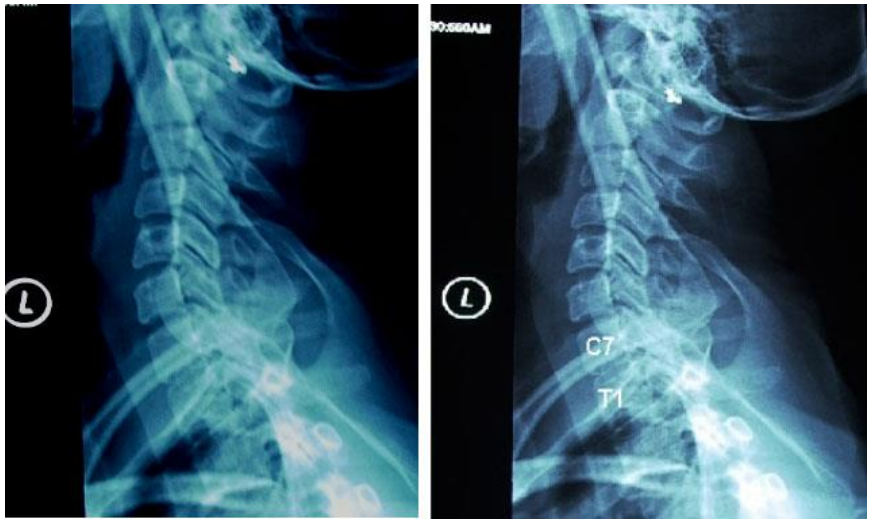


Open mouth view for odontoid fracture

X-RAY:

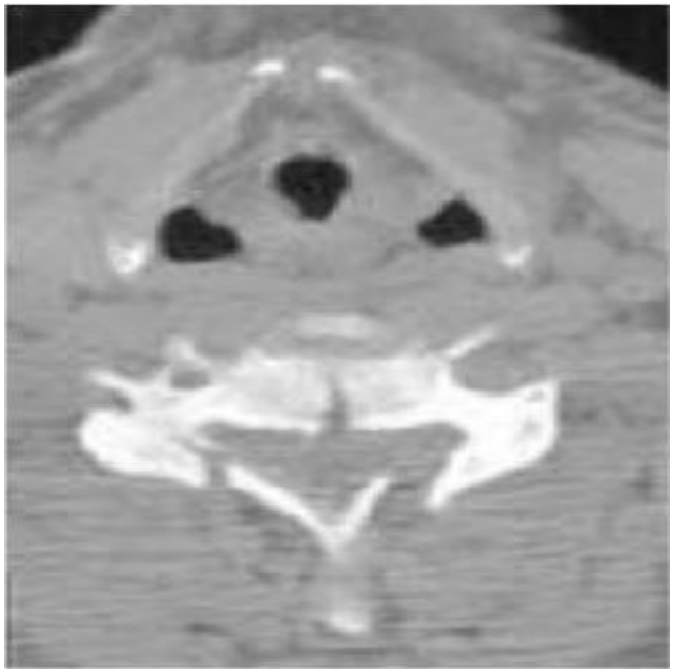
- Swimmer’s view for C7-T1.

Most important



- Flexion.-Extension

CT-scan :

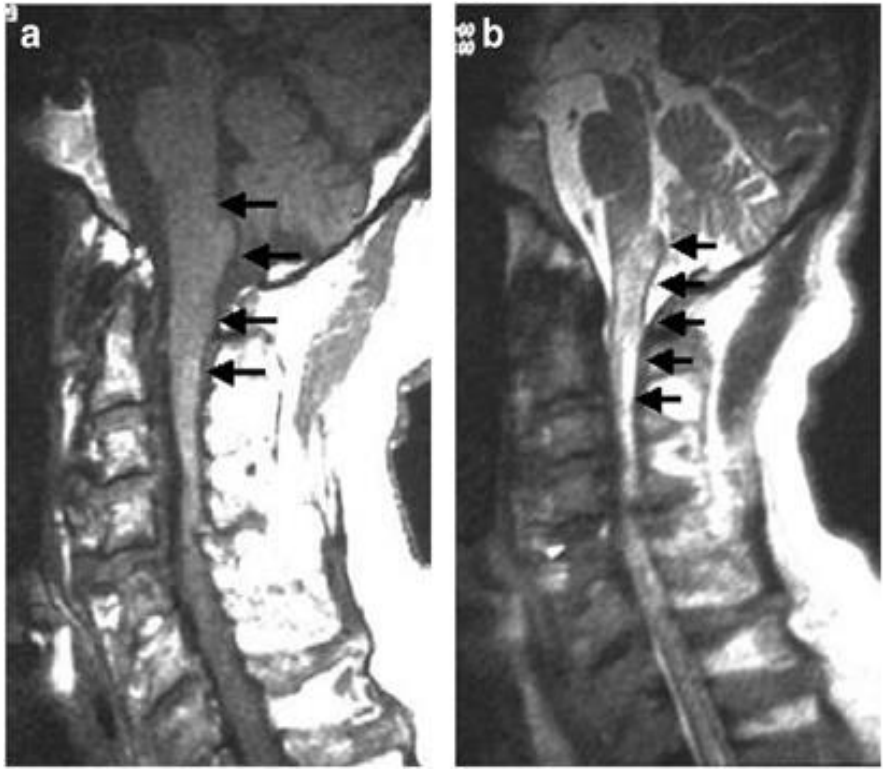


MRI:

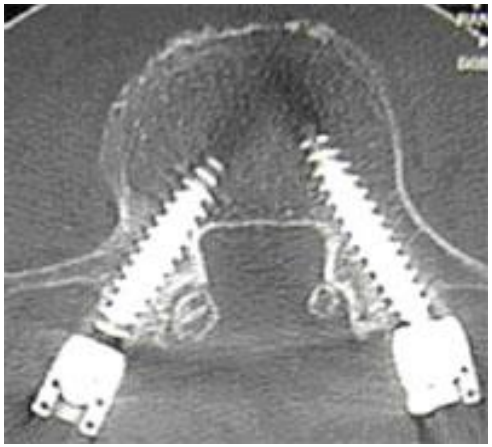
Not used in ER

Most useful for visualizing *soft tissue structures*

For bleeding, disc prolapse,...



Spinal instrumentations:



Rehabilitation:

Qs: whats the first Xray, first step