



The University of Jordan

School of Medicine

Lectures in Pictures

Spinal Cord Injuries



Dr. Tareq Kanaan
Director of Neurosurgery Dept.

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.



Etiology:

RTA

Sports

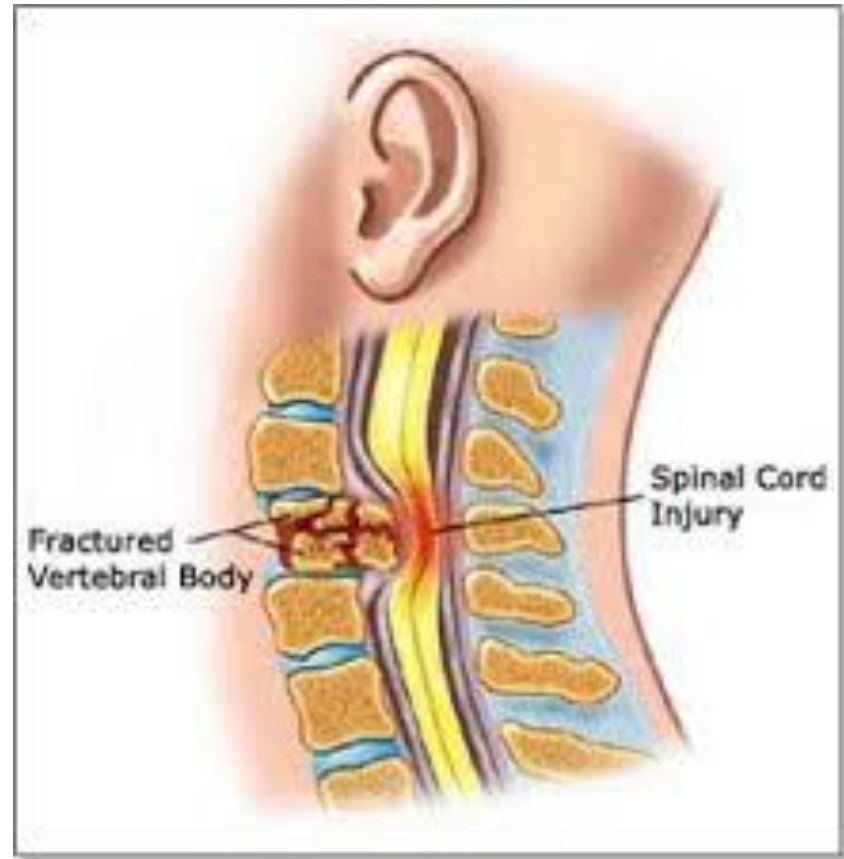
Falling Down

Assaults



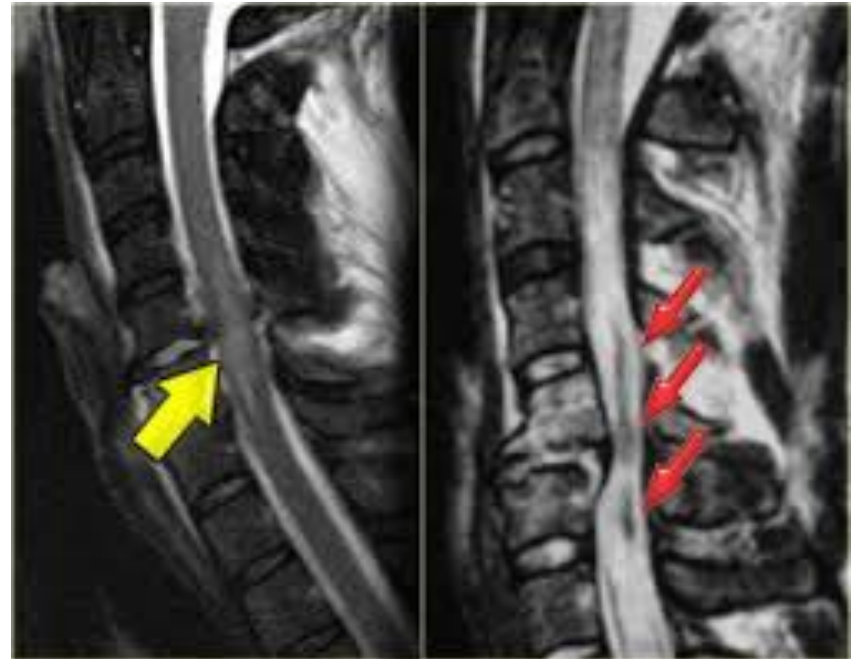
Anatomy:

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



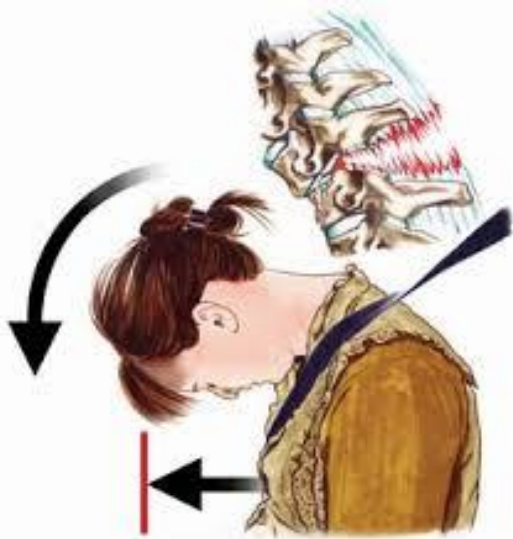
Pathophysiology of spinal cord injury

- 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:

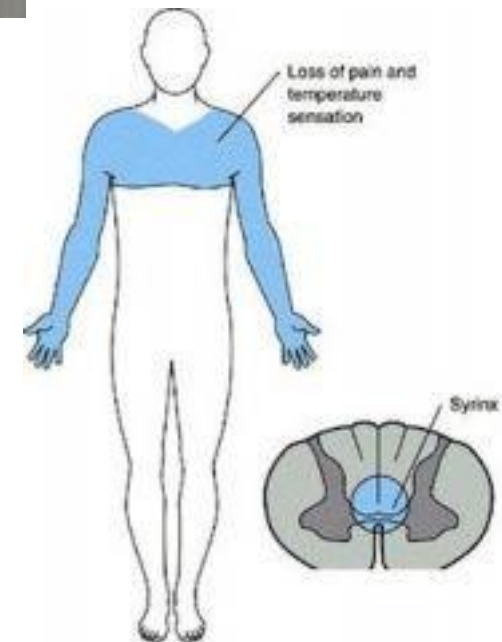
- The classic syndrome of quadriplegia with upper and lower extremity areflexia; anesthesia below the affected level.
- Neurogenic shock (ie, hypothermia and hypotension without compensatory tachycardia);
- Loss of rectal and bladder sphincter tone.
- Respiratory insufficiency ??
- Spinal shock.



B .Incomplete Spinal Cord Injuries

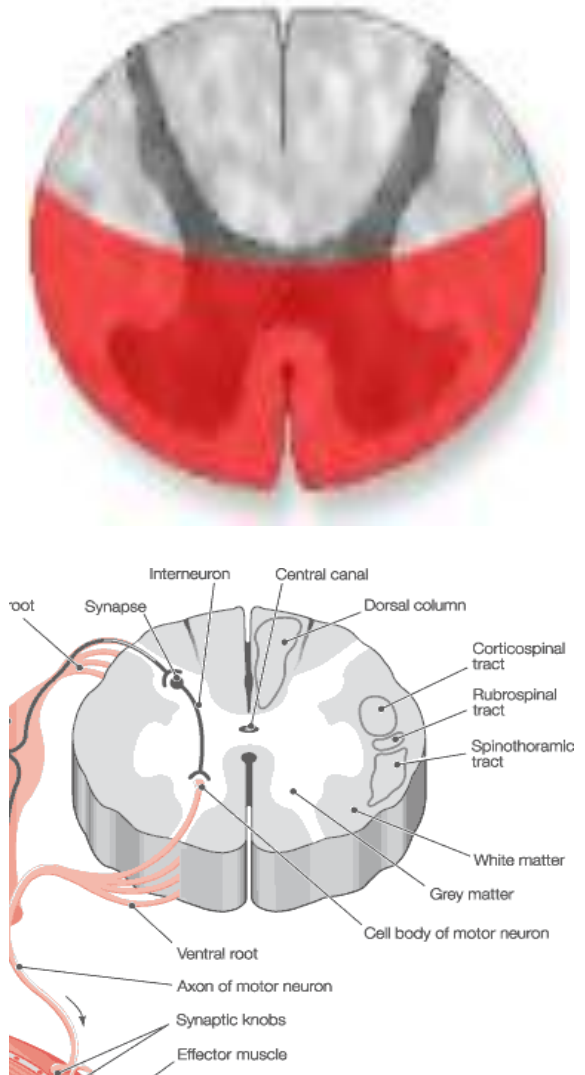
1.central cord syndrome:

- 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



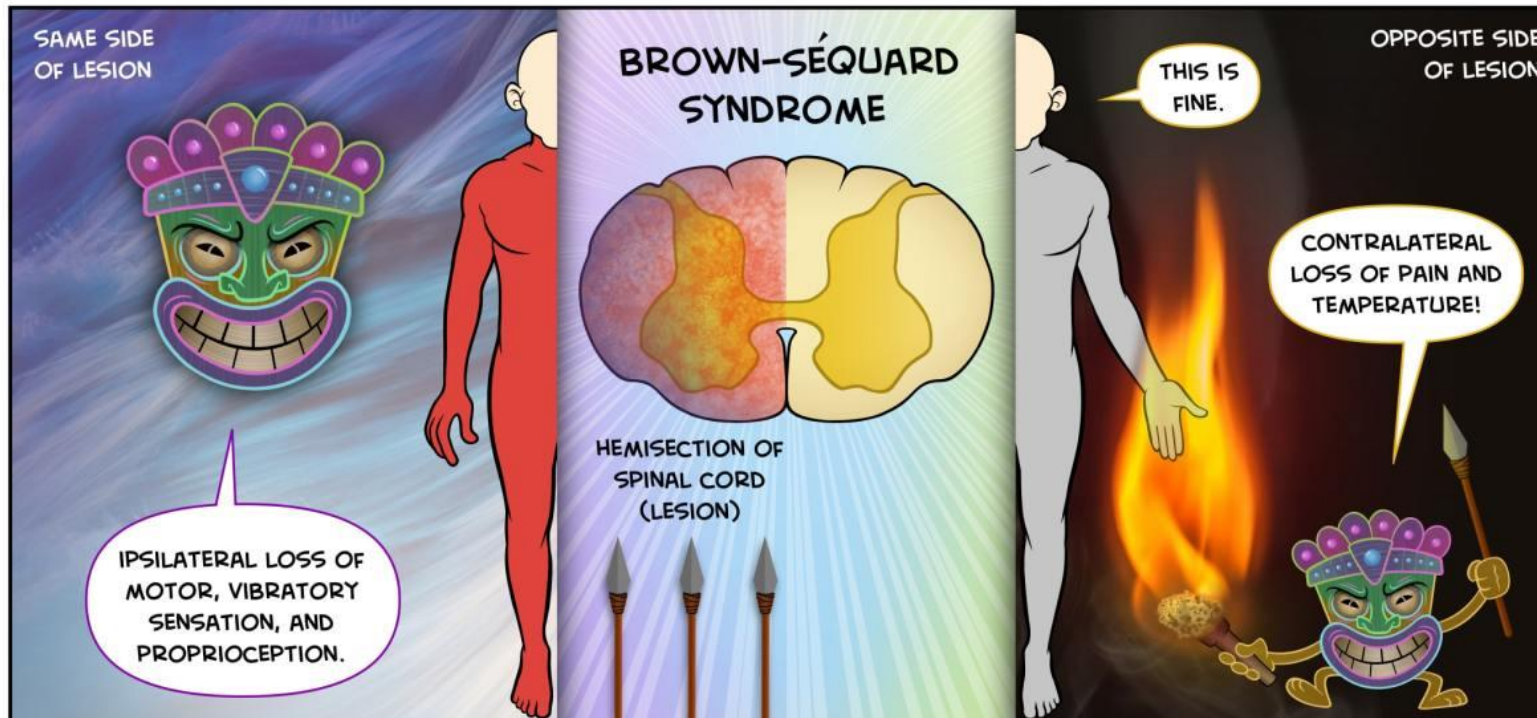
Brown-Séquard syndrome

Hemi trans section of S.C



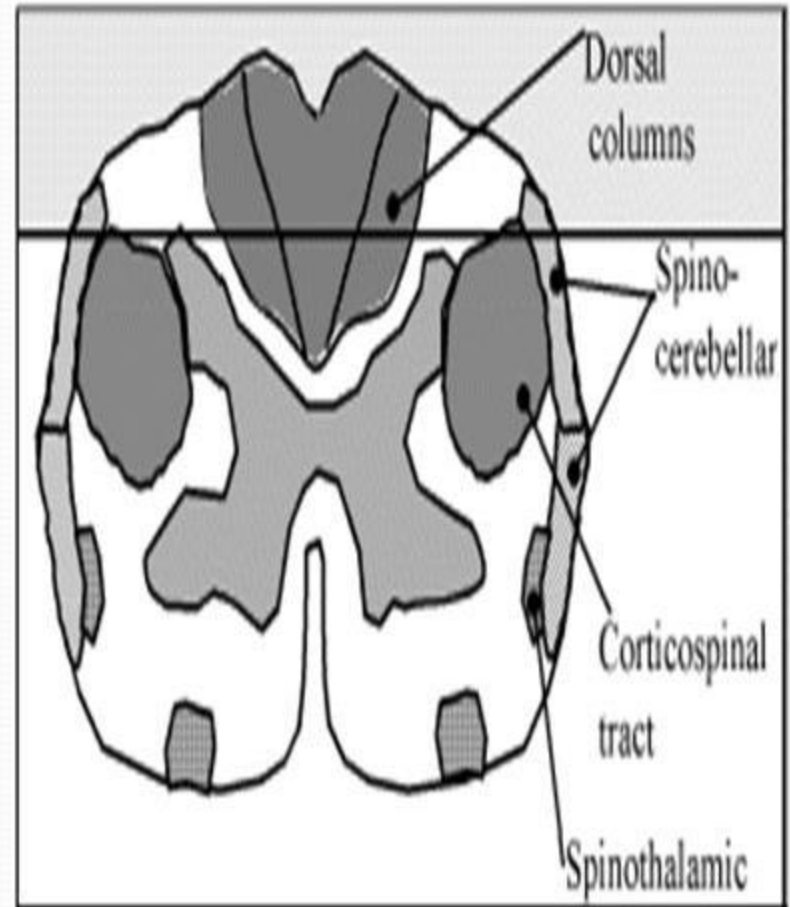
- **Ipsilateral** :paralysis, loss of vibration and position sense below the level of the lesion.

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



Posterior Cord Syndrome

- 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



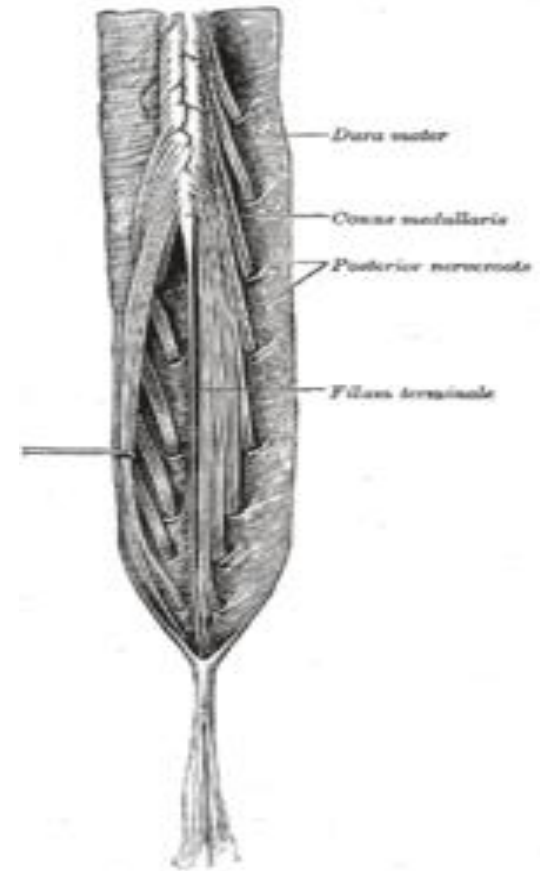
Management in the field:

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



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.



In hospital acute Management :

Including:

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

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

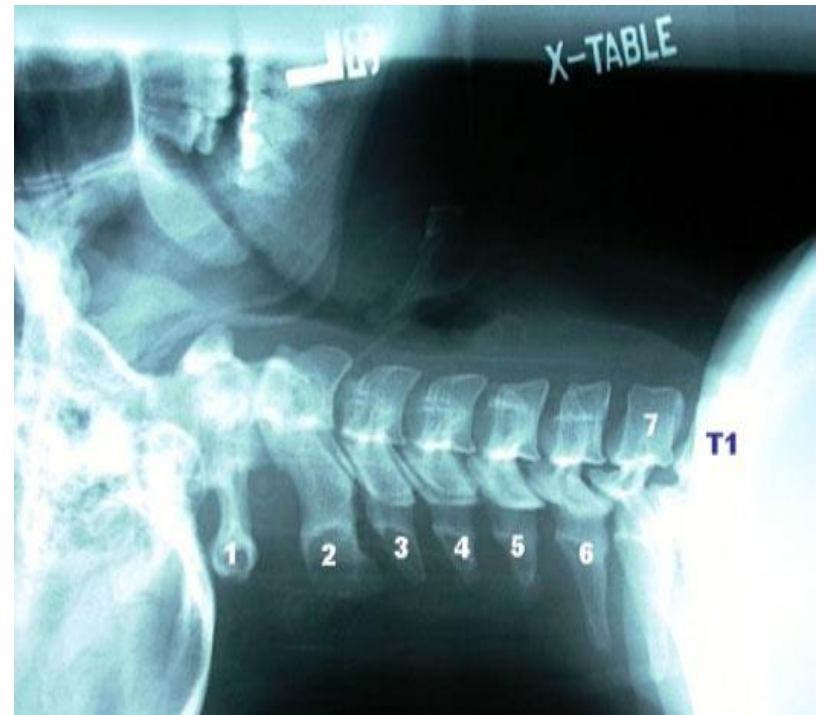
? edema

? ischemia

? inadequate immobilization

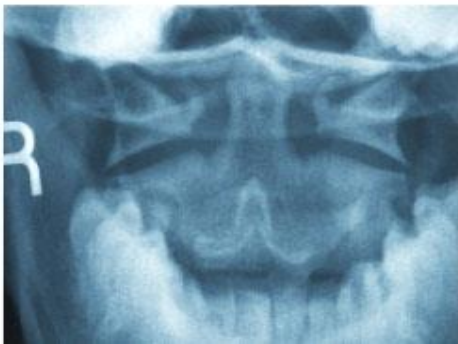
X-ray:

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



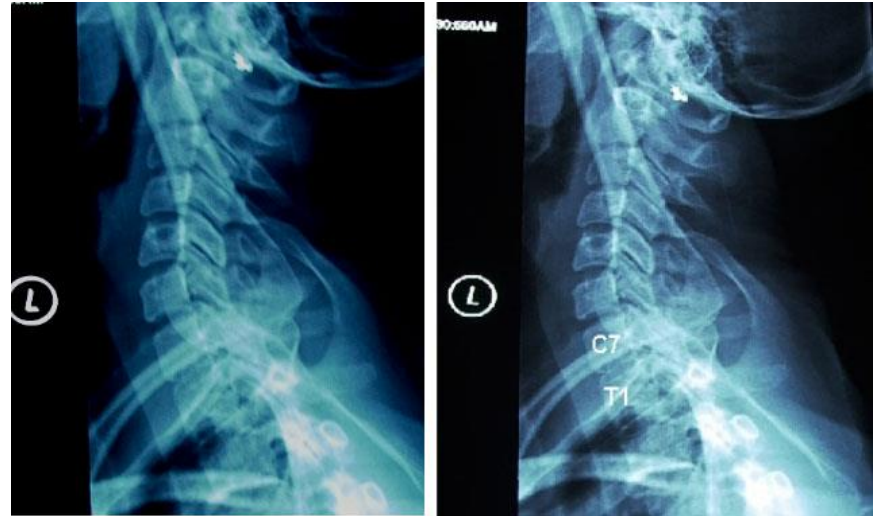
X-RAY:

- AP/Lat.:92% sensitivity.

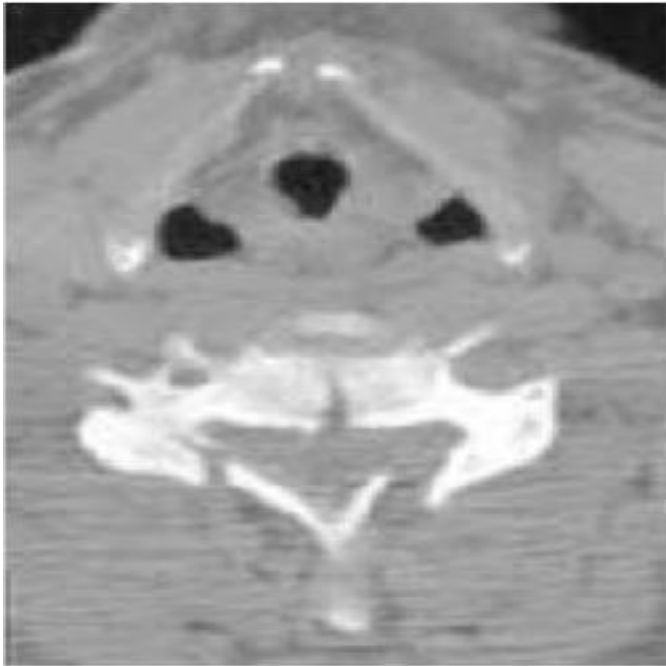


X-RAY:

- Swimmer's view for C7-T1.
- Flexion.-Extension

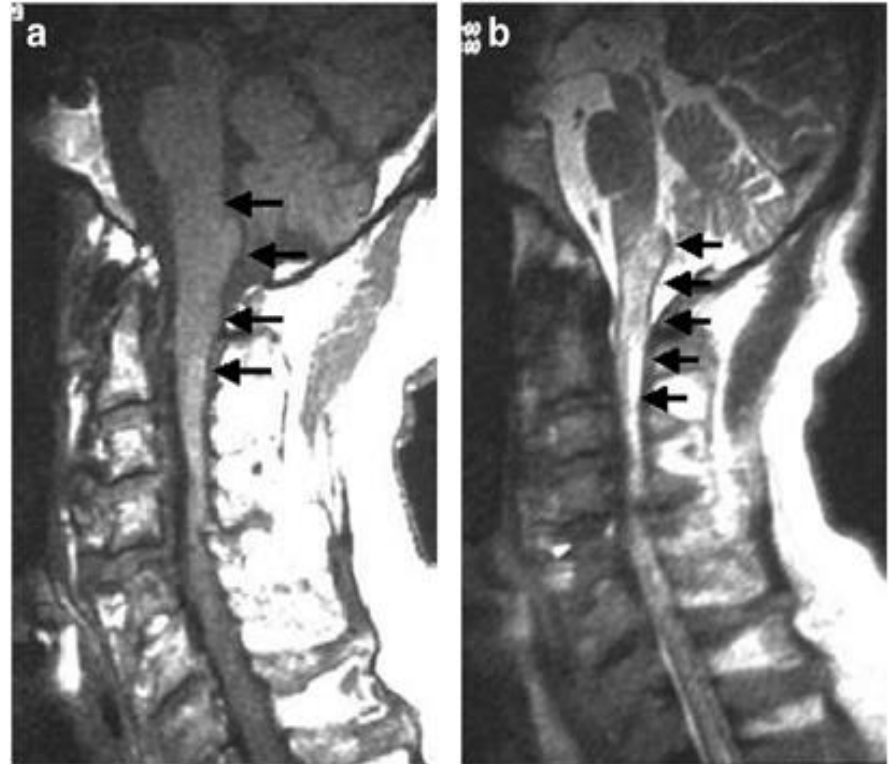


CT-scan :

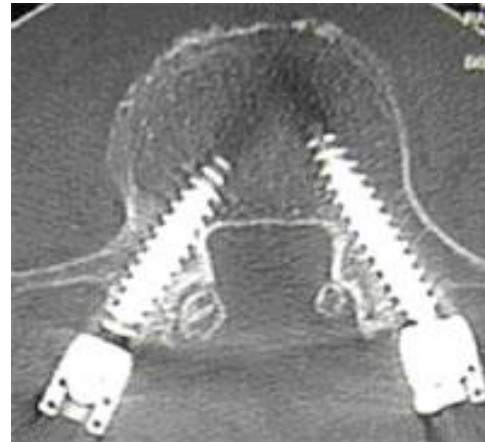


MRI:

Most useful for
visualizing *soft tissue*
structures



Spinal instrumentations:



Rehabilitation:

