

TRAUMA OF SPINE



By : Morteza Faghih

All patients have an injury until proven otherwise.

Poor immobilization techniques may cause a second neurological insult in up to 25% of patients.





Advanced Trauma Life Support (ATLS)

airway, breathing, and circulation.

شرح حال

PAIN





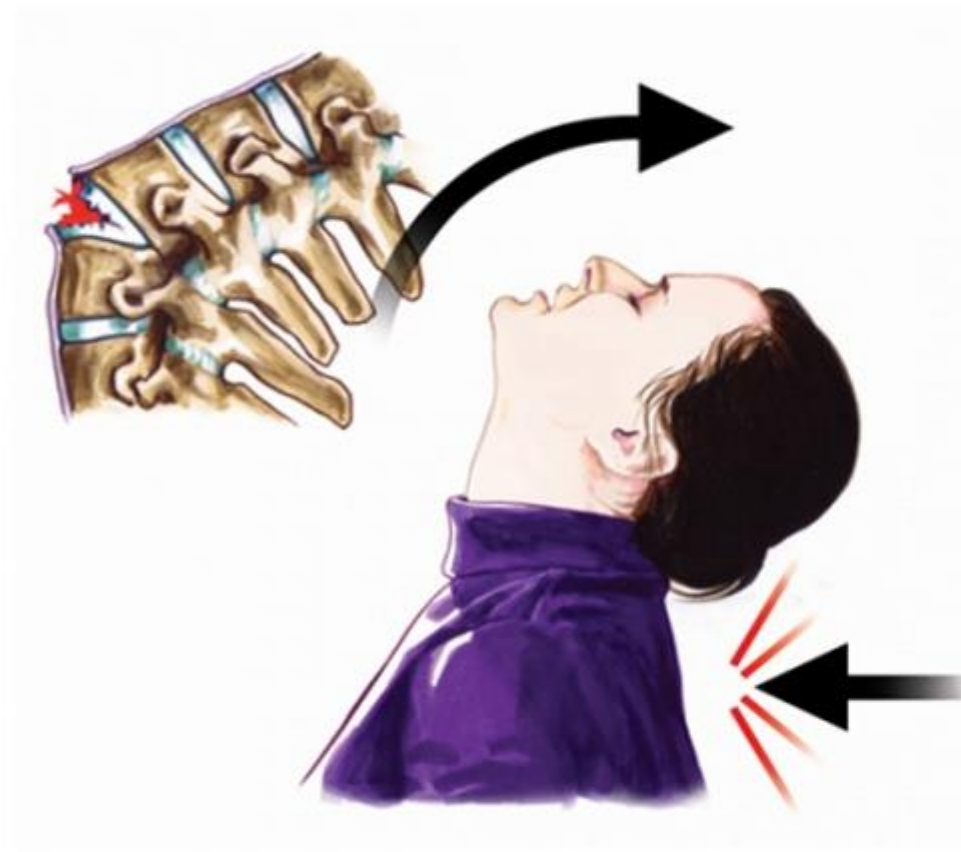
MECHANISM OF TRAUMA



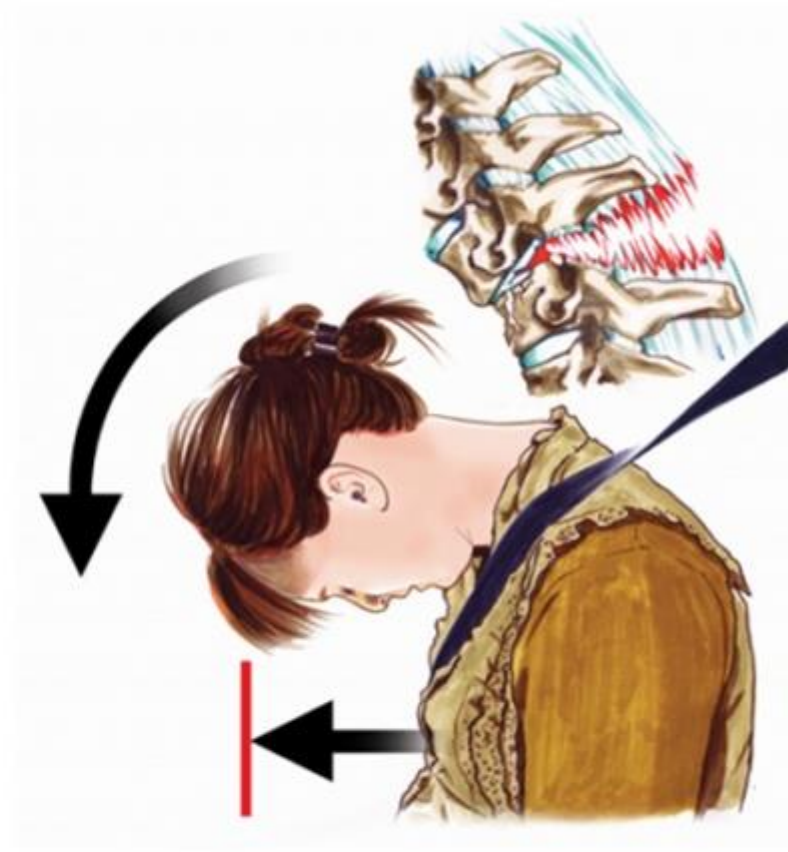








Hyperextension



Hyperflexion

High risk mechanisms:

speed > 60 Kmph

death at the scene

fall from height > 3m

معاینه

Consciousness

unstable, distracting, intoxicated

Neurological Deficit

Tenderness





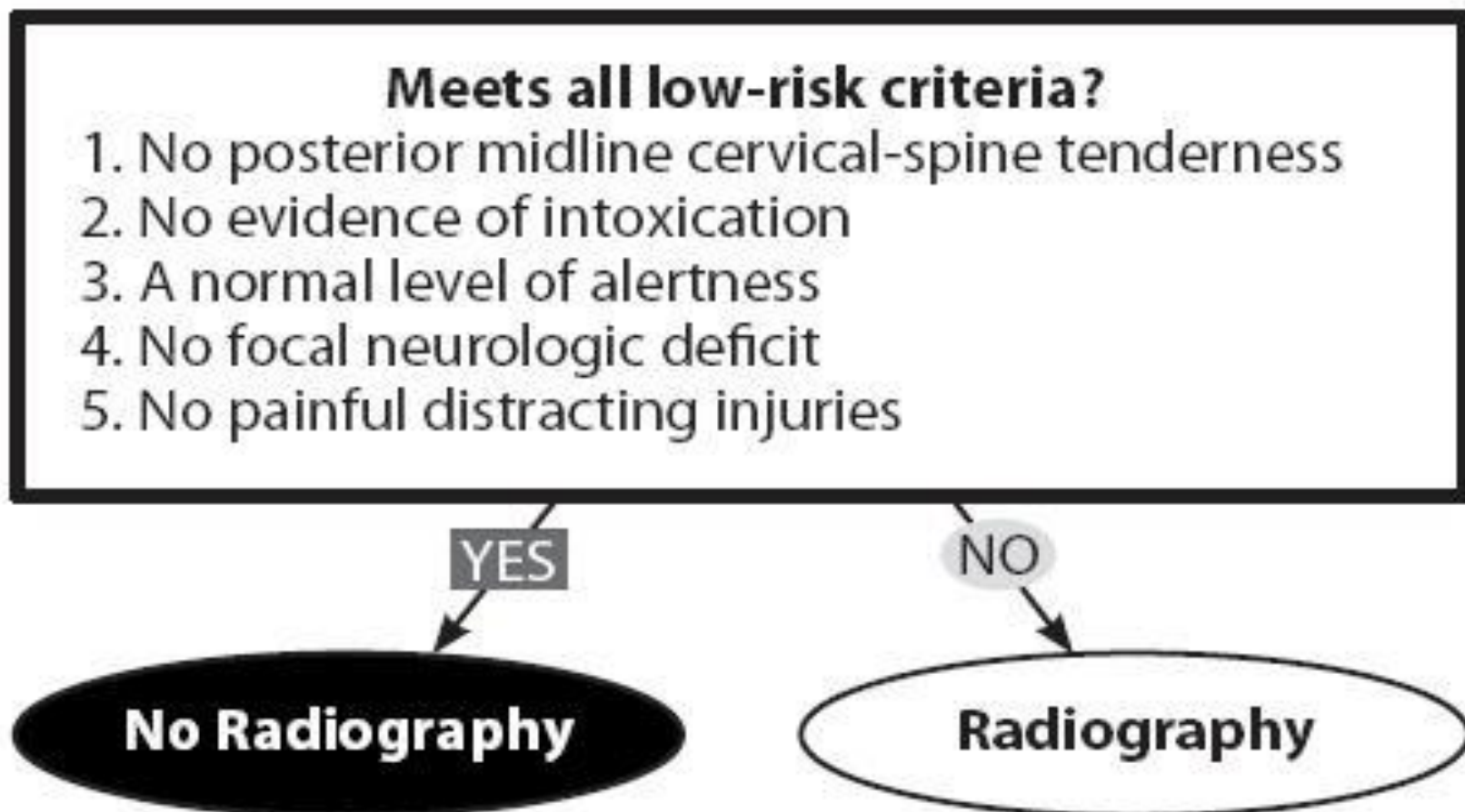








Figure 11. National Emergency X-Radiography Utilization Study (NEXUS) Criteria



Any High Risk Factors?

ANY of the following:

- Age \geq 65 years
- Dangerous Mechanism
- Paresthesias in extremities

Pt has high risk factor?

Well... then you should get...

None?

You may proceed...

Any Low Risk Factors?

ANY of the following:

- Simple rear-end MVC
- Sitting position in ED
- Ambulatory at ANY TIME
- Delayed (i.e. not immediate) onset of neck pain
- Absence of midline C-spine tenderness

Not even one?

Then... they aren't low risk!

One of the above?

Excellent... proceed with ROM

Able to Rotate Neck actively?

i.e. Rotate neck 45 degrees left & right.

Can't move their neck?

Then... they aren't low risk!

Great!

Based on the CCR...

No Radiography

Radiography

NEUROLOGICAL DEFICIT:

MOTOR
SENSORY

Patient Name _____ Date/Time of Exam _____
Examiner Name _____ Signature _____

RIGHT

MOTOR KEY MUSCLES

Light Touch (LTR) Pin Prick (PPR)

UER
(Upper Extremity Right)

Elbow flexors C5
Wrist extensors C6
Elbow extensors C7
Finger flexors C8
Finger abductors (little finger) T1

Comments (Non-Key Muscle? Reason for N7? Pain? Non-SCI condition?):

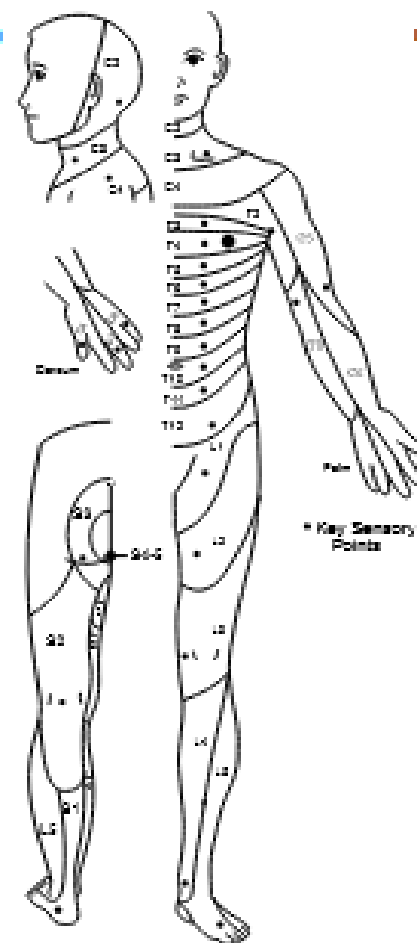
LER
(Lower Extremity Right)

Hip flexors L2
Knee extensors L3
Ankle dorsiflexors L4
Long toe extensors L5
Ankle plantar flexors S1

(VAC) Voluntary Anal Contraction
(Yes/No) ☐

RIGHT TOTALS
(MAXIMUM)

C2			
C3			
C4			
C5			
C6			
C7			
C8			
T1			
T2			
T3			
T4			
T5			
T6			
T7			
T8			
T9			
T10			
T11			
T12			
L1			
L2			
L3			
L4			
L5			
S1			
S2			
S3			
S4-5			



SENSORY KEY SENSORY POINTS

Light Touch (LTL) Pin Prick (PPL)

MOTOR KEY MUSCLES

LEFT

UEL
(Upper Extremity Left)

Elbow flexors C5
Wrist extensors C6
Elbow extensors C7
Finger flexors C8
Finger abductors (little finger) T1

Comments (Non-Key Muscle? Reason for N7? Pain? Non-SCI condition?):

LEL
(Lower Extremity Left)

Hip flexors L2
Knee extensors L3
Ankle dorsiflexors L4
Long toe extensors L5
Ankle plantar flexors S1

(DAP) Deep Anal Pressure
(Yes/No) ☐

LEFT TOTALS
(MAXIMUM)

C2			
C3			
C4			
C5			
C6			
C7			
C8			
T1			
T2			
T3			
T4			
T5			
T6			
T7			
T8			
T9			
T10			
T11			
T12			
L1			
L2			
L3			
L4			
L5			
S1			
S2			
S3			
S4-5			

MOTOR SUBSCORES

UER ☐ + UEL ☐ = UEMS TOTAL ☐
MAX (25) (25) (50)

LER ☐ + LEL ☐ = LEMS TOTAL ☐
MAX (25) (25) (50)

SENSORY SUBSCORES

LTR ☐ + LTL ☐ = LT TOTAL ☐
MAX (56) (56) (112)

PPR ☐ + PPL ☐ = PP TOTAL ☐
MAX (56) (56) (112)

NEUROLOGICAL LEVELS

Steps 1-5 for classification as on reverse

1. SENSORY ☐ ☐
2. MOTOR ☐ ☐

3. NEUROLOGICAL LEVEL OF INJURY (NLI) ☐

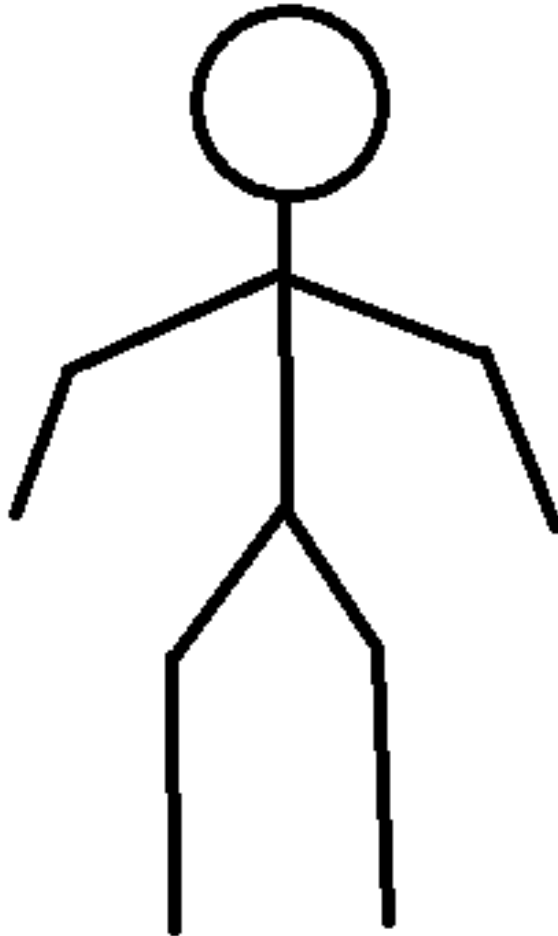
4. COMPLETE OR INCOMPLETE? ☐
Incomplete = Any sensory or motor function in S4-5

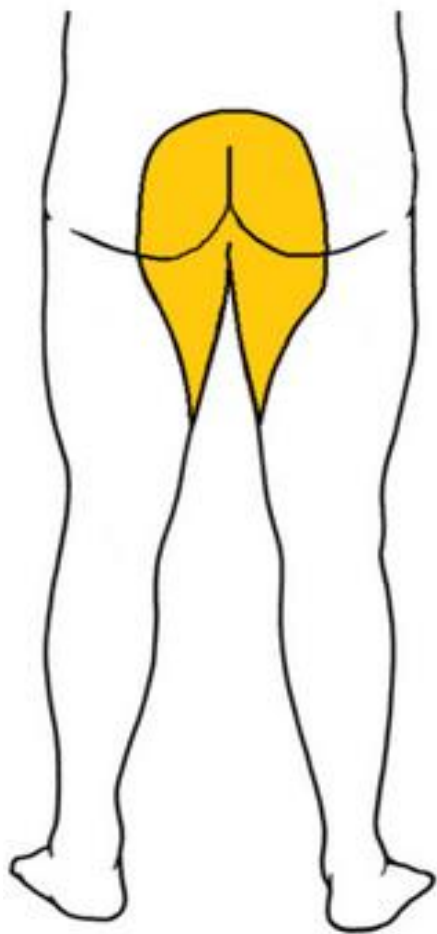
5. ASIA IMPAIRMENT SCALE (AIS) ☐

6. ZONE OF PARTIAL PRESERVATION ☐
(In injuries with above motor OR sensory function in S4-5 only)
Note sacral levels with any innervation

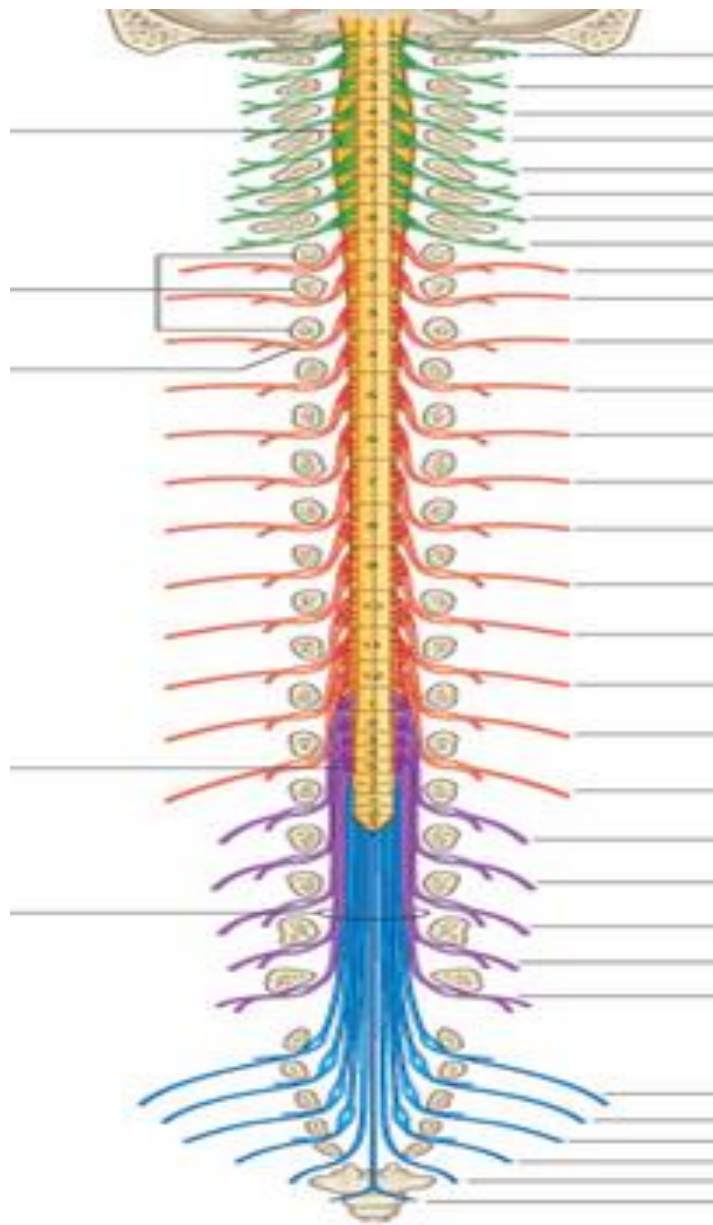
7. SENSORY ☐ ☐
MOTOR ☐ ☐

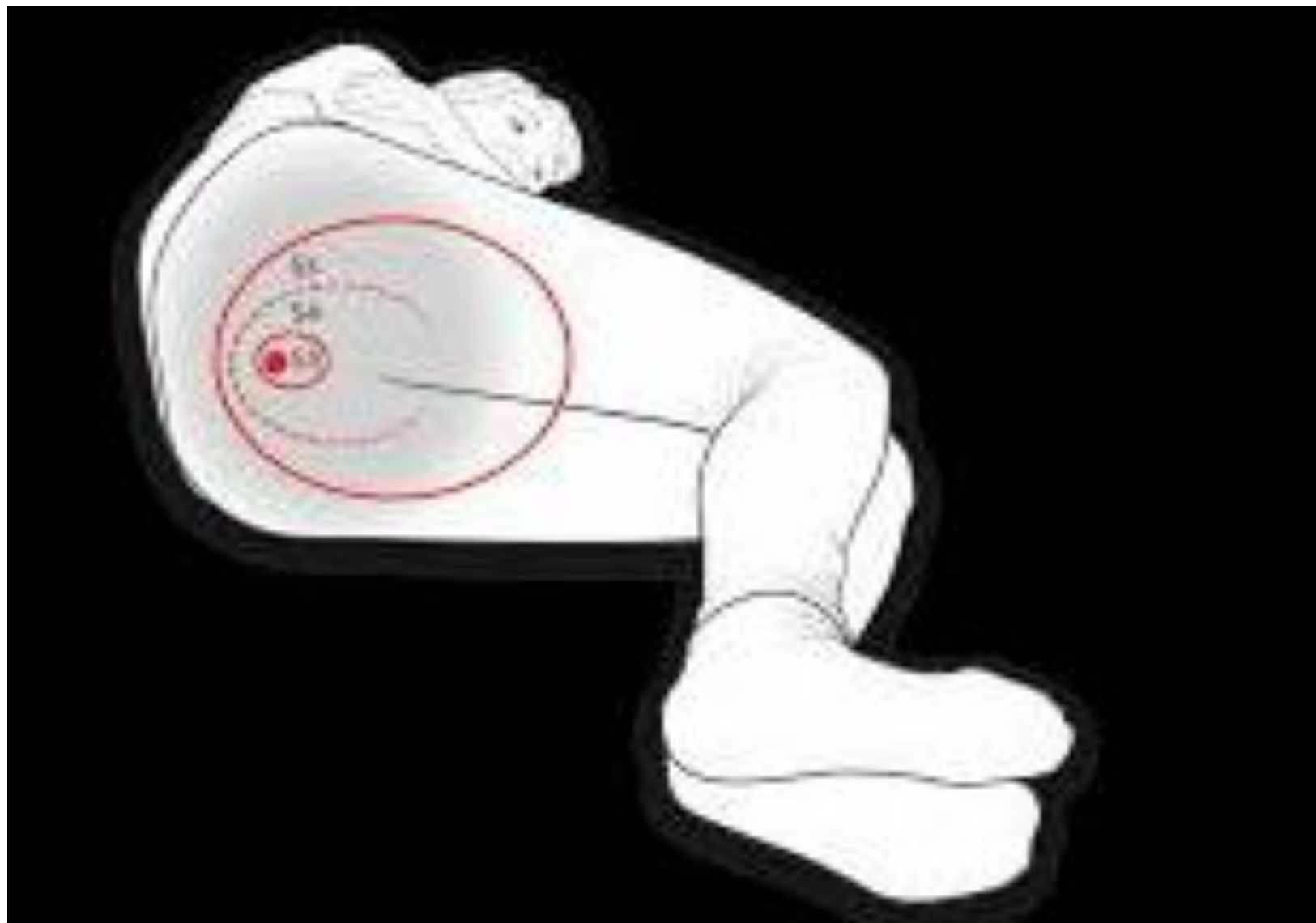
NEUROLOGICAL DEFICIT





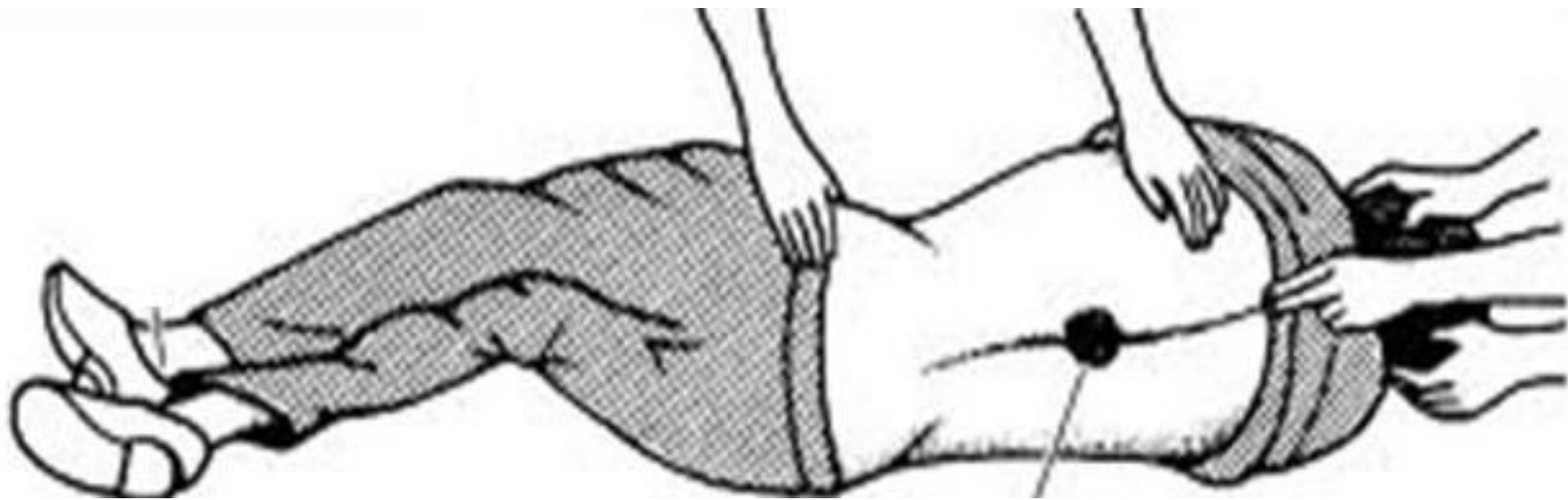
SADDLE





TENDERNESS





Attending Physician :	پرستش معالج :	Ward :	بخش :	Name :	نام :	Family Name :	نام خانوادگی :
Admission Date :	تاریخ پذیرش :	Room :	اتاق :	Date Of Birth :	تاریخ تولد :	Father's Name :	نام پدر :
		Bed :	تخت :				

Presenting Symptoms : نشانه های فعلی بیمار :

MECHANISM

History of Present Illness : تاریخچه بیماری فعلی :

PAIN

GCS

Past Disease History : تاریخچه بیماری های قبلی :

sensory, motor, saddle

Current Drug therapy & Other : داروهای در حال مصرف و سایر احتیاجات :

tenderness

Allergy To : حساسیت به :

Family History : سوابق خانوادگی :

CT or X ray ?

**many advocate the use of CT scanning
as initial screening if available.**

Imaging options will depend on availability of particular institutions and include radiography and CT.

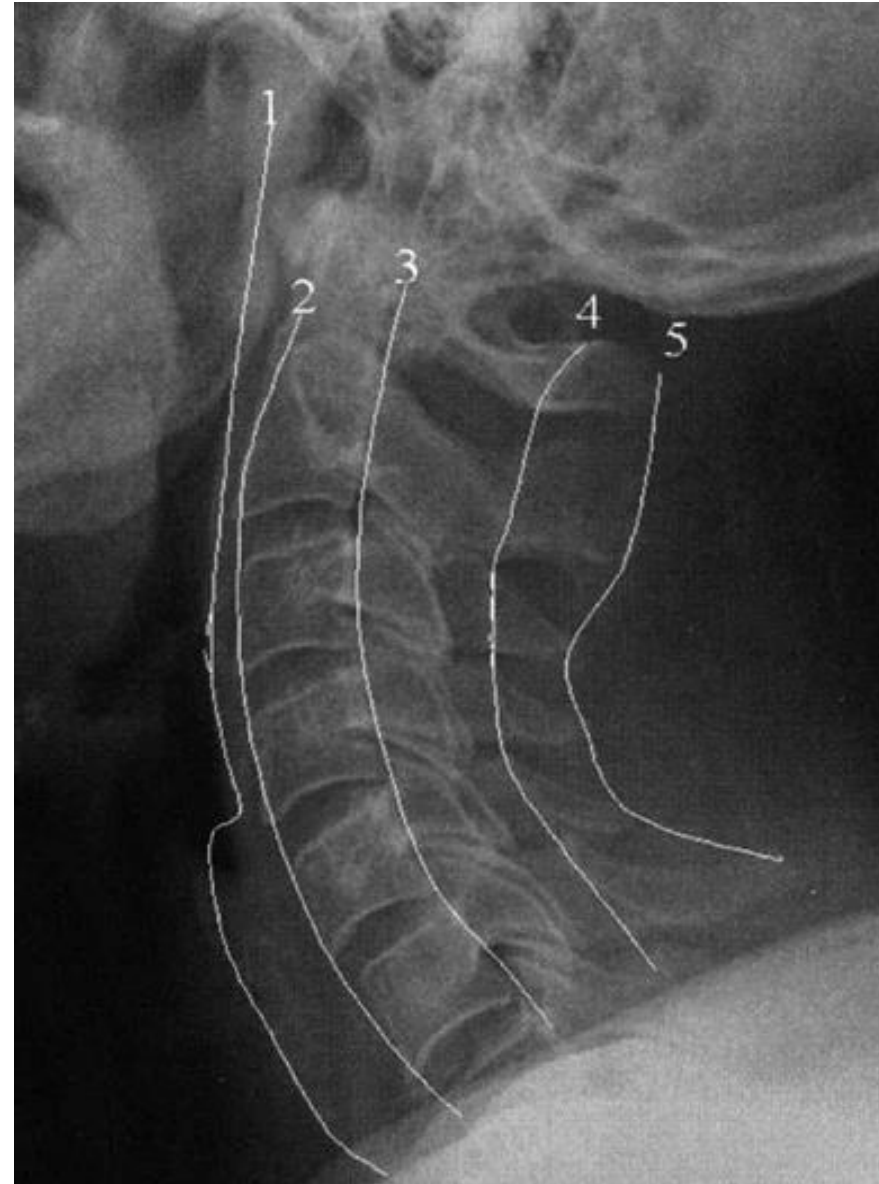
MRI is indicated in patients with a neurological deficit

Lateral flexion-extension radiographs

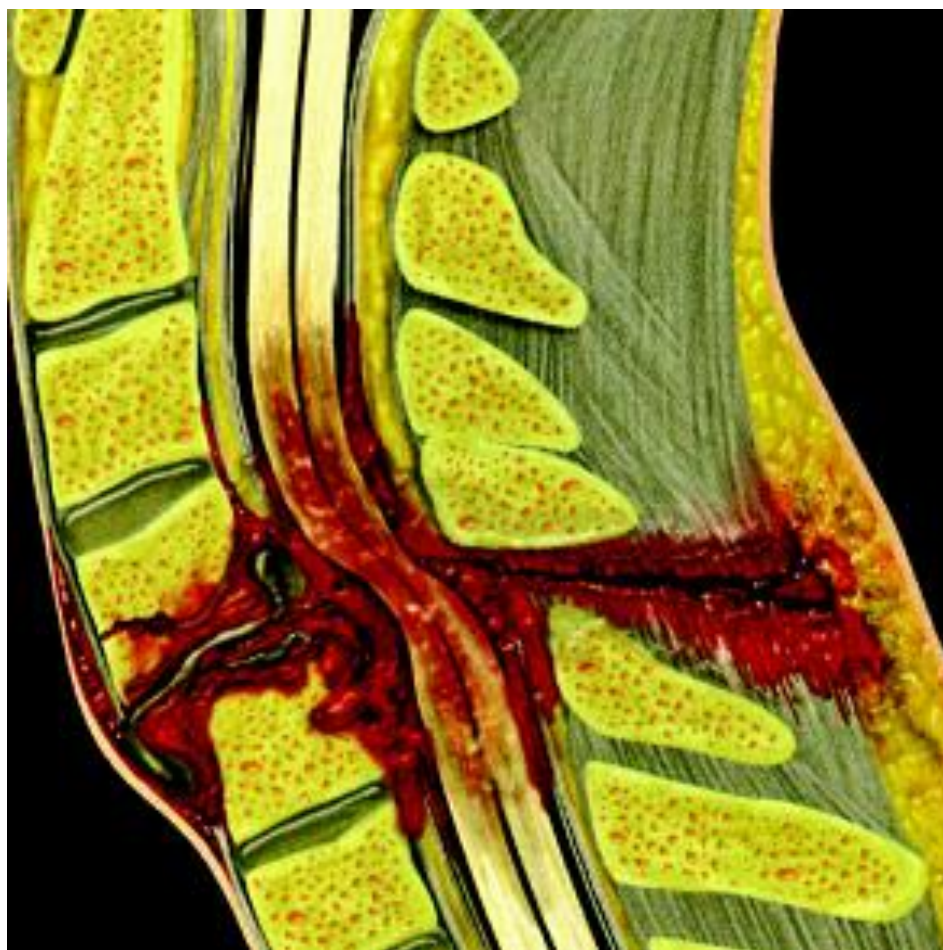
no findings on physical examination and radiographs,
with persistent pain
may be indicated in the subacute setting.

However, in the acute setting, the usefulness is limited
because of pain and muscle spasm.

- 1) prevertebral soft tissue line
- 2) anterior vertebral line
- 3) posterior vertebral line
- 4) spinolaminar line
- 5) posterior spinous line









Hangman's fracture



T11 T12 L1 L2

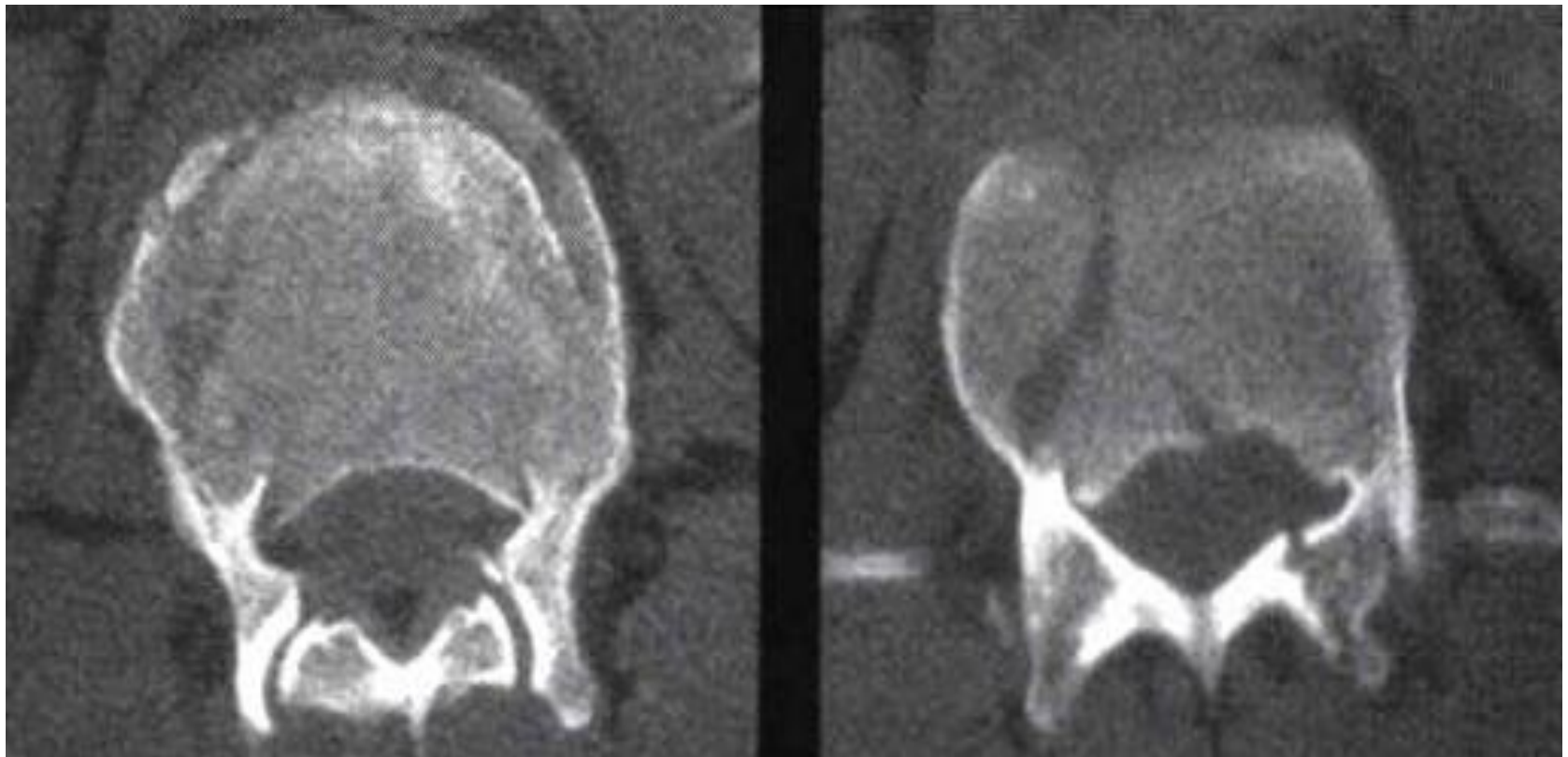


SUPERIOR ENDPLATE



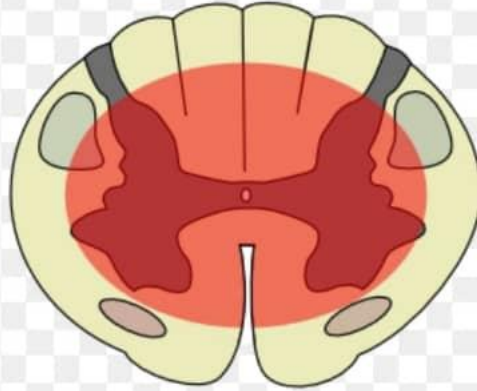


CT scan is ideal for fracture

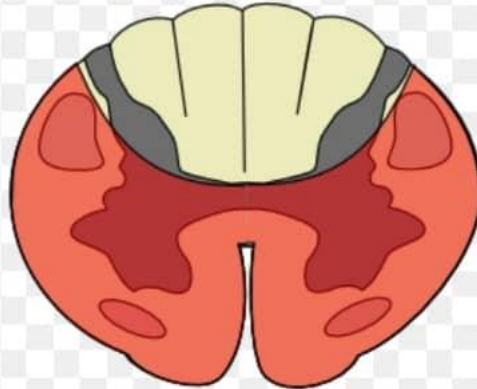




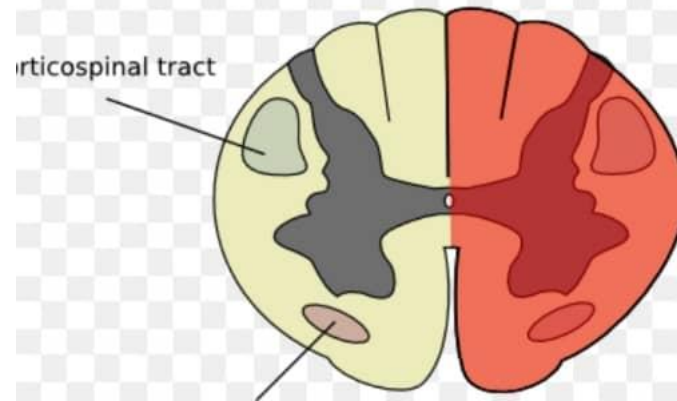
Central Cord Syndrome



Anterior Cord Syndrome



Brown-Séquard Syndrome



TREATMENT

IMMOBILIZATION

BLOOD PRESSURE

CORTICOSTEROID??

