

Spinal Injury Initial management

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SpineClass 2010



- ATLS guidelines
- Protection spine and spinal cord
(Manual immobilisation when securing an air way)



Spinal Injury until proven otherwise



Prevent secondary injury

- Optimisation of oxygenation and hemodynamic stability
- Aim of resuscitation is to restore cord perfusion without oedema

Shock in SCI

- 20% hypotensive
- 75% Neurogenic shock----Bradycardia

History

- Mechanism of injury (Thoracic injuries in motorcyclist)
- History of Ankylosing spondylitis or DISH High risk of fracture

Physical clues

- Abdominal ecchymosis from seatbelt injuries (Flexion-distraction)
- Inspection of Back
- High index of suspicion with head or facial injuries or altered consc.

Neurological Evaluation

- Initially AVPU
- 2nry Survery--Full neurological evaluation

Investigation

- AP/Lateral and Odontoid views
- CT scan (cervicothoracic junction and C1/2 rotation or subluxation)
- MRI: Fractures not well visualised. Good for soft tissue



Cervical Spine Clearance

- ↑ Complication with prolonged immobilisation
- X-Ray: AP-Lat and odontoid views.
- Even with adequate radiography 15-17% of injuries are missed

When to remove the collar? Alert patient

- Flex-Ext. views
- MRI may be oversensitive
- NPV >99% with 3 view radiograph and CT or flexion-Extension radiograph

Obtunded patients

- MRI--no correlation between findings and significant injury
- Patients with low risk can be cleared on basis of radiograph and CT

Obtunded patients

Patients requiring further imaging

- High velocity < 35mph
- Fall from height more than 10ft
- Neurological deficit
- Closed head injury
- # pelvis or extremity

Examination

ASIA

STANDARD NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

| MOTOR | | SENSORY | |
|----------------------------|--------------------|-------------------------|--------------------|
| KEY MUSCLES | KEY SENSORY POINTS | KEY MUSCLES | KEY SENSORY POINTS |
| C2: Neck flexion | C2: Light touch | C2: Neck extension | C2: Pain |
| C3: Shoulder abduction | C3: Light touch | C3: Shoulder adduction | C3: Pain |
| C4: Elbow flexion | C4: Light touch | C4: Elbow extension | C4: Pain |
| C5: Wrist extension | C5: Light touch | C5: Wrist flexion | C5: Pain |
| C6: Wrist flexion | C6: Light touch | C6: Elbow flexion | C6: Pain |
| C7: Elbow flexion | C7: Light touch | C7: Elbow extension | C7: Pain |
| C8: Hand grip | C8: Light touch | C8: Hand grip | C8: Pain |
| T1: Finger abduction | T1: Light touch | T1: Finger adduction | T1: Pain |
| T2: Finger extension | T2: Light touch | T2: Finger flexion | T2: Pain |
| T3: Finger flexion | T3: Light touch | T3: Finger extension | T3: Pain |
| T4: Wrist extension | T4: Light touch | T4: Wrist flexion | T4: Pain |
| T5: Wrist flexion | T5: Light touch | T5: Wrist extension | T5: Pain |
| T6: Elbow extension | T6: Light touch | T6: Elbow flexion | T6: Pain |
| T7: Elbow flexion | T7: Light touch | T7: Elbow extension | T7: Pain |
| T8: Forearm pronation | T8: Light touch | T8: Forearm supination | T8: Pain |
| T9: Forearm supination | T9: Light touch | T9: Forearm pronation | T9: Pain |
| T10: Hip extension | T10: Light touch | T10: Hip flexion | T10: Pain |
| T11: Hip flexion | T11: Light touch | T11: Hip extension | T11: Pain |
| T12: Ankle plantar flexion | T12: Light touch | T12: Ankle dorsiflexion | T12: Pain |

ASIA IMPAIRMENT SCALE

A = Complete: No motor or sensory function preserved in the sacral segments S4-S5.

B = Incomplete: Sensory but not motor function preserved below the neuroanatomical level and includes the sacral segments S4-S5.

C = Incomplete: Motor function is preserved below the neuroanatomical level and more than half of key muscles below the neuroanatomical level have a muscle grade less than 3.

D = Incomplete: Motor function is preserved below the neuroanatomical level and at least half of key muscles below the neuroanatomical level have a muscle grade of 3 or more.

E = Normal: Motor and sensory function are normal.

CLINICAL SYNDROMES

Central Cord
 Cervical Cord
 Conus Medullaris
 Cauda Equina

FRANKEL SCALE

- A Complete Paralysis
- B Sensory preservation below level of injury
- C B+useless motor function
- D B+usefull motor function
- E Normal function

Examination

- Sacral sensory sparing
- Spinal Shock----absent reflexes
Bulbocavernosus reflex first to recover
Total deficit >24hr----limited recovery

Classification

- Complete
- Incomplete: N.root injury, Anterior cord syndrome, Brown Sequard synd., central cord synd.



Initial Treatment

- Corticosteroids

Yes or No

Corticosteroids

- Initial studies showed encouraging results
Prevent Oedema and improve outcome

Ref: NASCIS (1984) J AM Med Assoc 25(1):45-53

Corticosteroids

- Later studies (NASCIS II) outcome is better if
ttt within 8hrs.

• Ref: NASCIS IIN Engl J Med 322(20):1405-11

Corticosteroids

- Recent studies did not confirm this
- Most centres in UK no longer use steroids.



Re-align Quickly

- Reduction in less than 4hrs is best but not often possible
- MRI prior to skeletal traction to excluded extruding disc fragment

Initial Management

- Re-assess patient because neurological picture keeps changing
- D/W Spinal or neurosurgical unit.

