

Spinal injuries 2

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Incidence of SCI

10 - 15 per million, 18 - 35 years , Male - 3:1, RTA 51% - cars, Domestic 16%, Industrial 11%, Sports 16% - diving incidents, Self harm 5%

Frequency according to site of injury

Cervical 40%, Thoracic 10%, Lumbar 3%, Dorso lumbar 35%, Any 14%

Classifications of SCI

1. By mechanism of injury
2. By level of injury:
 - A. skeletal
 - B. neurologic
3. Completeness or degree of injury

Mechanism of SCI

1. primary insult
2. secondary insult Caused by a multiple chain of events triggered by the original insult (sequelae) leading to Progressive cell death and Progressive inflammation

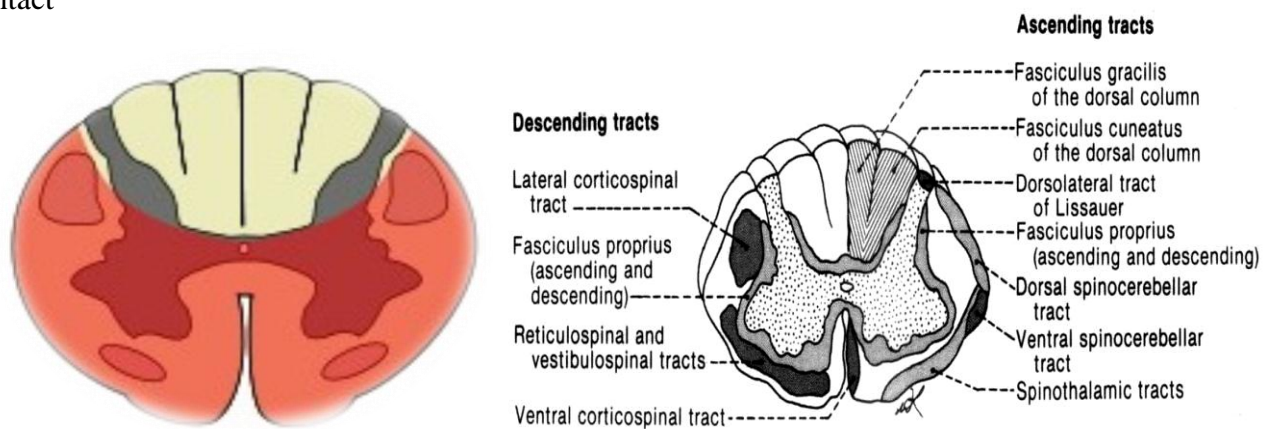
Signs and symptoms (presentation)

Depends on level of injury and degree of spinal cord affection

1. complete SCI: all functions below the injured area are lost (loss of sensory & motor functions) whether or not the spinal cord is severed

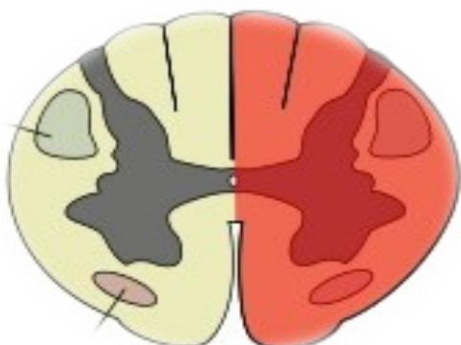
2. incomplete SCI: Involves preservation of motor or sensory function below the level of injury in the spinal cord and usually there must be some preservation of sensation or motion in the areas innervated by S4 to S5 e.g. voluntary external anal sphincter contraction as the nerves in this area are connected to the very lowest region of the spinal cord thus retaining sensation and function in these parts of the body. Incomplete SCI can further be subdivided into

A. Anterior cord syndrome: due to damage to the front portion of the spinal cord or reduction in the blood supply from the anterior spinal artery caused by fractures or dislocations of vertebrae or herniated disks, below the level of injury, motor function, pain sensation, and temperature sensation are lost, while sense of touch and proprioception (sense of position in space) remain intact

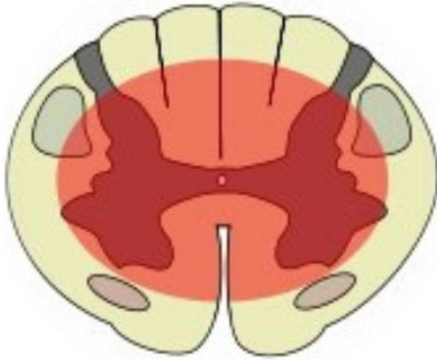


B. Posterior cord syndrome: where just the dorsal columns of the spinal cord are injured, usually occurs in cases of chronic myelopathy and infarction of the posterior spinal artery. This rare syndrome causes the loss of proprioception and sense of vibration below the level of injury with preservation of other spinal cord functions

C. Brown-Séquard syndrome: occurs when the spinal cord is injured on one side much more than the other due to penetrating wounds (such as gunshot or knife wounds) or fractured vertebrae or tumors. On the ipsilateral side of the injury (same side), the body loses motor function, proprioception, and senses of vibration and touch. On the contralateral (opposite side) of the injury, there is a loss of pain and temperature sensations.



D. Central cord syndrome: usually results from neck hyperextension in older people with spinal stenosis. In younger people, it results from neck flexion. Patient usually presented with weakness in the arms (arms are more affected due to their central location in the spinal cord) and relative sparing of the legs (due to their more external location) and spared sensation in regions served by the sacral segments. sensation of pain, temperature, light touch, and pressure below the level of injury are lost as well.



E. Conus medullaris and cauda equina syndromes: In conus medullaris the injury affects the end of the spinal cord, located at about the T12–L2 vertebrae in adults. This region contains the S4–S5 spinal segments, responsible for bowel, bladder, and some sexual functions, which can be affected. With cauda equina syndrome(L2–S5) peripheral nerves already branched off from the spinal cord are affected resulting in low back pain, weakness or paralysis in the lower limbs, loss of sensation, bowel and bladder dysfunction, and loss of reflexes. Unlike conus medullaris syndrome, symptoms often affect only one side of the body

Suspected Spinal Injury

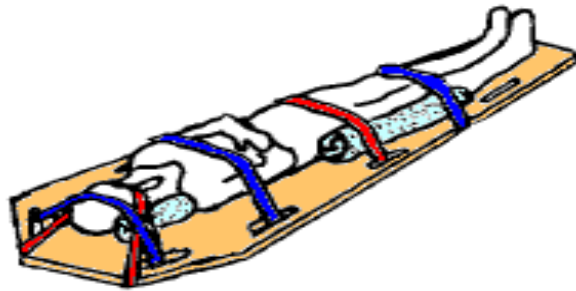
- High speed crash
- Unconscious
- Multiple injuries
- Neurological deficit
- Spinal pain/tenderness
- Up to 15% of spinal injuries have a second (possibly non adjacent) fracture elsewhere in the spine

Goal of spine trauma care

1. Protect further injury during evaluation and management
2. Identify spine injury or document absence of spine injury
3. Optimize conditions for maximal neurologic recovery

Initial Management

1. Immobilization (Rigid collar, Sandbags and straps, Spine board, Log-roll to turn)
2. Prevent hypotension (Pressors: Dopamine, not Neosynephrine, Fluids to replace losses; do not overhydrate)
3. Maintain oxygenation (O₂ per nasal canula, If intubation is needed, do NOT move the neck)
4. Advance Trauma Life Support (ATLS) guidelines



Management in the hospital

- NGT to suction (Prevents aspiration)
- Decompress the abdomen (paralytic ileus is common in the first days)
- Foley (Urinary retention is common)
- Methylprednisolone (Solu-Medrol: Only if started within 8 hours of injury) exclusion criteria include (Cauda equina syndrome, Pregnancy, Age <13 years, Patient on maintenance steroids)

Prognosis

Spinal cord injuries generally result in at least some incurable impairment even with the best possible treatment. The best predictor of prognosis is the level and completeness of injury, as measured by the ASIA impairment scale. The neurological score at the initial evaluation done 72 hours after injury is the best predictor of how much function will return. Patients with complete injuries usually do not have functional motor recovery, but improvement can occur. Most patients with incomplete injuries recover at least some function