Neurosurgery – Spinal Trauma

Whiteboard Animation Transcript
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Trauma to the spine and spinal cord can occur in a variety of settings, including motor vehicle accidents, shallow water diving, and falls. Usually, significant trauma is needed to cause spinal injuries in young, healthy individuals.

However, keep in mind that older patients or those with pre-existing conditions may have vulnerable bones. These conditions include:

- Rheumatoid Arthritis
- Ankylosing spondylitis
- Osteoporosis
- Cervical spondylosis

Suspect serious spinal injury in these patients, even if the history indicates minor trauma.

Management should focus on minimizing risk of further injury. Always immobilize all patients with suspected spinal injury. The paramedics will have done this in the field by putting a cervical collar on the patient and securing the patient to a rigid, padded backboard with head supports in place.

While you carry out your ABCs, make sure to keep the patient immobilized until you can clear the spine. In fact, if the patient has a head injury or is confused or complaining of spinal pain, assume a spinal injury or even a spinal cord injury until proven otherwise, and keep patient immobilized. Failure to do so in the individual with an unstable spinal injury can result in further neurologic damage. The spine can be cleared if there is absence of clinical signs, such as midline cervical tenderness and neurological deficits, and normal radiographs.

Following initial stabilization, continue to monitor the vital signs, keeping an eye out for signs of neurogenic shock. This can occur with injuries above T6 and manifests as hypotension and bradycardia depending upon how high the injury occurs in the spine. Treatment includes fluid resuscitation, and vasopressors.

Special consideration of airway management in cervical spine injury is due. High cervical cord injuries may result in inability to breathe due to diaphragmatic paralysis, thus requiring immediate ventilatory support. Those with lower cervical injury may not immediately have respiratory distress because of preserved diaphragmatic function, but develop delayed respiratory failure due to paralysis of accessory muscles of breathing.
Anticipating the need for airway management in the cervical spine injured patient well ahead of time gives opportunity to enlist the help of airway experts (anesthesiologist, for example) in a controlled fashion. In the emergency setting, securing the airway in the most practiced fashion for the individual physician (usually direct orotracheal intubation with inline stabilization) is best.

Spinal injury at levels below the conus (below L1 usually) may result in compression of the cauda equina. This bundle of rootlets floating loosely in spinal fluid can tolerate a surprising degree of canal intrusion in trauma. In the patient with lumbar level spinal trauma, more detailed myotomal and dermatomal examination including perineal sensation may reveal focal deficits in the patient who at first screening appears intact.