Knife Injury to the Cervical Spine

A 55-year-old man suffered a knife wound to the right neck. There was resultant quadriplegia with some sensory sparing in the lower extremities. Axial CT (Figure A) and axial gradient echo MR (Figure B) of the cervical spine demonstrated a transverse fracture of the right C3 lamina (arrow) with a small focus of adjacent soft-tissue emphysema identified on CT. Sagittal STIR MR image of the cervical spine (Figure C) revealed abnormal cord signal with a small focus of high-intensity signal abnormality in the anterior spinal cord near the midline consistent with focal injury/edema (arrow).

Traumatic injury to the spinal cord can be broadly categorized as complete and incomplete. Complete spinal cord injury refers to the total disruption of the spinal cord with expected loss of sensory and motor function inferior to the injured level. Incomplete spinal cord injuries have a wide variety of clinical syndromes depending on the extent and location of spinal cord disruption. Due to the known locations of ascending and descending tracts within the cord, the location of the injury to the spinal cord can be used to predict the neurological deficits. Many classic incomplete cord syndromes have been described with associated neurological deficits including central, dorsal, ventral, and Brown-Sequard syndrome.

This patient had neurological deficits most consistent with a ventral cord syndrome, which typically results in complete motor loss as well as loss of crude touch, temperature, and pain below the injury level. In addition to trauma, disc herniation, multiple sclerosis, and cord infarct/ischemia due to compromise of the anterior spinal artery can all result in ventral cord syndrome.

References