

A Case of Spinal Cord Injury

by

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Case Presentation

Jason Hendrix is a 21-year-old senior at the University of Delaware, majoring in economics. While on spring break in Florida, Jason was involved in a one-vehicle motorcycle accident. In the accident, Jason was thrown from his bike to the pavement, landing on his back. A police officer witnessed the accident and immediately called for medical assistance. Emergency personnel arrived within minutes, and upon recognizing the seriousness of Jason's back injury, immobilized his neck and secured him to a rigid board prior to transporting him to the emergency room of the nearest hospital.

When he arrived at the hospital, Jason was conscious and complained of pain in his lower back. Upon examination by the emergency room personnel, Jason was found to have numerous abrasions and contusions, and loss of both sensation and motor control of his legs. After he was stabilized, a complete neurological exam was performed to assess and localize Jason's injury. The neurological exam revealed the following:



Jason demonstrated normal or near normal strength in flexing and extending his elbows, extending his wrists, and when flexing his middle finger and abducting his little finger on both hands. However, he exhibited no movement when medical personnel tested his ability to flex his hips, extend his knees, and dorsiflex his ankles. Stretch reflexes involving the biceps, brachioradialis, and triceps muscles were found to be normal, while those involving the patella and ankle were absent. In addition, Jason was found to have normal sensitivity to pin prick and light touch in areas of his body above the level of his inguinal (groin) region, but not below that region of the body.

Questions

1. Describe the functional anatomy of the spinal cord using the following terms: *white matter*, *gray matter*, *tracts*, *roots*, and *spinal nerves*.
2. Define the terms *reflex* and *spinal reflex*, and identify the components of a *reflex arc*.
3. Define the term *spinal cord injury* (SCI) and state its prevalence.
4. Define the terms *neurological level*, *tetraplegia*, and *paraplegia*.
5. Define the terms *dermatome* and *myotome* and explain how each relates to SCI.
6. Define the term *stretch reflex* and describe how such reflexes are used to anatomically localize SCI.
7. Based upon the results of Jason's neurological exam, what is the *neurological level* of his SCI?
8. Discuss the management of SCI and the factors that determined the prognosis for this condition.

Image Credit: Detail of *The Injured Mason* by Francisco de Goya, 1786–87. Oil on canvas. Museo del Prado, Madrid, Spain.

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