



E94 Epidural Hematoma in a Whiplash Cervical Injury: A Rare Condition

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Learning Overview: After attending this presentation, attendees will better understand the dynamics of whiplash with the possible deadly consequences it can determine.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating how uncommon the following type of case is and how to deal with the consequences.

The name 'Whiplash Injury' (WI) derives from the etiopathogenic description of the sharp whipping movement of the head and neck, produced at the moment of a traffic accident, particularly following rear-end, head-on, or side collisions. The use of safety belts has led to a reduction in deaths derived from front-end collisions, but also to an increase in cases of typical whiplash. There are two types of force that cause WIs in rear-end car crashes: external forces applied to the body by the seat and head restraint, and internal forces generated by the activation of the body's muscles. The combination of these forces causes a differential motion between the superior and inferior tracts of the cervical spine (hyperextension-hyperflexion), which results in a strain of the neck tissues. This event can have consequences for all the neck structures: facet joints capsule, muscles, intervertebral disks, nerves, and vessels.

WI is characterized by a collection of symptoms that occur following damage to the neck, usually as a result of a sudden strain affecting the discs, muscles, nerves, or tendons of the neck caused by a sudden acceleration or deceleration of the head and neck. The head is violently thrown back, forward, or sideways, followed by reflex contraction in the opposite direction.

A condition that sometimes occurs after motor vehicle accidents are epidural hematomas. Although the pathogenesis of epidural hematomas remains widely controversial, there is a general consensus that all patients experienced the same mechanism of trauma since they were involved in a high-speed motor vehicle accident as a passenger, a pedestrian, or a bicyclist. Any deceleration, such as that occurring during cervical hyperflexion or hyperextension injuries, may result in a vascular lesion, with or without vertebral fracture

This study reports a case of a 68-year-old woman. The subject, while driving his car, hit another car head-on from the opposite direction and the woman in the hit car died immediately. During autopsy, there were no external signs consistent with fatal injuries. The only identifiable lesions were bruising in various body areas. The internal examination revealed no lesions of the head and brain; also, the organs of the abdomen had no particular alterations. There were multiple rib fractures with pulmonary laceration in the chest. When the neck organs were removed, there was evidence of infiltration of the perivertebral muscles. At the observation of the cervical vertebrae, there was a fracture of the fifth cervical vertebra. Diffuse epidural hemorrhage was also identifiable. Small hemorrhages were also found in the spinal cord.

Histological investigation confirmed the findings of the macroscopic examination. Surely the death of the subject was caused by the damage to the spinal column and spinal cord caused by the kinetic energy that developed due to a sudden acceleration followed by a deceleration. This dynamic caused vertebral fracture, epidural hemorrhage and bone marrow hemorrhage.

Whiplash, Epidural Bleeding, Traumatic Injury