International Journal of Medical Science and Pharmaceutical Research

ISSN(e): 3050-5720
ISSN(p): 3050-5712

Vol. 02(08): 70-72, August 2025

Home Page: https://ijmspr.org/

The Invisible Fatal Injury: Postmortem Revelation of Cervical Spine Fracture/Dislocation: A Case Report

Ogbata SE[1], Ehidiamhen FE[2], Chukwuegbo CC[1], Ogbata LNN[3], Jegede OO[1], Nnoli MA[4]

[1] Department of Anatomic Pathology, Federal Medical Centre Umuahia, Abia State, Nigeria/Department of Anatomic Pathology, Faculty of Basic Clinical Sciences, College of Medicine and Health Sciences, Gregory University Uturu, Abia State, Nigeria

[2] Department of Anatomic Pathology, David Umahi Federal University Teaching Hospital, Uburu, Ebonyi State, Nigeria

[3] Nursing Services Department, Federal Medical Centre Umuahia, Abia State

[4] Department of Pathology, University of Calabar Teaching Hospital, Cross River State, Nigeria.

KEYWORDS:

Cervical spine fracture, Road traffic accident, Internal haemorrhage, Autopsy, Spinal trauma, Sudden death

Corresponding Author:

Ogbata Stanley Emeka

Published:

August 18, 2025

DOI:

https://doi.org/10.55677/IJMSPR/2025-3050-I804

ABSTRACT

Cervical spine injuries can be rapidly fatal, often without overt external signs, particularly in high-energy trauma such as road traffic accidents (RTAs). We report the case of a middle-aged man who died shortly after a night time RTA. Although he sustained only minor cutaneous injuries, autopsy revealed a fatal C6–C7 cervical spine fracture-dislocation associated with massive internal haemorrhage. This case underscores the importance of maintaining a high index of suspicion for spinal injuries in trauma cases and highlights the critical role of postmortem examination in uncovering hidden fatal injuries.

INTRODUCTION

Trauma is one of the leading causes of death worldwide, particularly among young and middle-aged adults, and road traffic accidents (RTAs) account for a significant proportion of these fatalities. According to the World Health Organization (2018), more than 90% of road traffic deaths occur in low- and middle-income countries, often due to inadequate enforcement of safety regulations, poor road conditions, and insufficient emergency medical services. Cervical spine injuries are frequently associated with high-energy trauma, such as RTAs, falls from height, or violent assaults. These injuries can result in spinal cord damage, vascular injury, and disruption of autonomic function, leading to rapid death or severe long-term disability (Leucht et al., 2009). Lower cervical spine injuries, particularly at the C6–C7 level, are biomechanically prone to instability due to the anatomical role in mobility and load-bearing (Radiology Assistant, 2008; WFSA, 2013). During high-impact events – such as rapid deceleration-hyperflexion-extension and axial compression frequently results in unstable fracture-dislocations in this region. (Radiology Assistant, 2008; WFSA, 2013). Importantly, cervical spine trauma may be clinically occult, especially in patients who die shortly after injury or those with minimal external evidence of trauma. The diagnosis of cervical spine injuries may be missed without imaging or postmortem examination, especially when there are no visible fractures, neurological deficits or major external trauma and clinical decision rules alone can miss serious injuries (Hoffman et al., 2004), and MRI studies have revealed soft tissue injury in over one-third of patients with otherwise normal assessments (Benzel et al 1996). In cases of sudden death following seemingly minor trauma, forensic autopsy plays a crucial role in determining the true cause of death and the underlying mechanism of injury (Sacco et al., 2025). This report presents a case of sudden death in a middle-aged man following a solitary RTA at night, where minor superficial external injuries masked a fatal cervical spine fracture-dislocation. The case underscores the need for high clinical suspicion of cervical injuries in all high-energy trauma patients and the forensic importance of a thorough autopsy.

CASE PRESENTATION

A middle-aged male was involved in a road traffic accident late at night while driving. Witnesses reported that the vehicle veered off the road and collided with a fixed structure. Emergency services arrived minutes after the incident and found the man unresponsive. Vital signs were absent, and cardiopulmonary resuscitation was initiated without success. He was declared dead shortly thereafter. External examination revealed only minor abrasions and superficial lacerations over the scalp and forehead. There was no evidence of facial or skull fractures, chest wall deformity, or gross limb trauma. Given the sudden death and absence of significant external injuries, a forensic autopsy was performed. On internal examination, there is generalized severe organ palor. The neck was carefully dissected and examined. A fracture-dislocation was discovered at the C6–C7 vertebral junction, with associated perivertebral blood vessels laceration and extensive haematoma of 76.0g equivalent to 228ml of whole blood in the surrounding prevertebral soft tissues and epidural space. The spinal cord at this level appeared compressed and contused. The left lung is partially collapsed and its posterior surface is blood stained. The left thoracic cavity contains 1,231.0g of blood clot equivalent to 3,693ml of whole blood. This brings the total blood loss to 3,921ml of whole blood. The surface of the right lung is smooth and there are sub-pleural anthracotic pigments. There is subgaleal haemorrhage but no fractures of the skull or intracranial haemorrhages. Other thoraco-abdominal organs were intact and free of significant trauma.

The cause of death was concluded to be cervical spine fracture-dislocation (C6–C7) with associated massive internal haemorrhage and spinal cord injury, likely resulting in neurogenic/haemorrhagic shock and respiratory/cardiac arrest. Toxicological studies revealed high level of blood alcohol.

Figure1: showing C6-C7 fracture-dislocation and precervical vertebral soft tissue haematoma.

Figure 2: showing left thoracic cavity massive haematoma. The left lung is reflected.

DISCUSSION

This case highlights several important clinical and forensic considerations in the management and evaluation of trauma-related deaths. The cervical spine, particularly the subaxial segment (C3–C7), is biomechanically and anatomically susceptible to injury in high-velocity trauma due to its flexibility, load-transmitting role, and proximity to vital neurovascular structures (Wang et al., 2021;

DiPompeo & Das, 2023). Dislocation or fracture at the C6–C7 level is especially dangerous, as it may lead to spinal cord transection, vertebral artery rupture, and rapid loss of cardiorespiratory function due to high spinal cord involvement. The mechanism of injury in this case is likely a result of forceful hyperflexion or axial loading of the cervical spine during the impact, which may have caused anterior displacement of C6 over C7 and subsequent spinal cord compression (Fehlings et al., 2012). The index patient sustained only minor superficial injuries, which may have led to an initial underestimation of the severity of trauma. This aligns with previous literature describing "occult cervical spine injuries"—cases where external signs are minimal but internal damage is catastrophic (Lin et al., 2003, Stiell et al., 2003). Such cases emphasize the necessity for strict spinal precautions and imaging in trauma protocols, even in the absence of visible injuries or neurological deficits. From a forensic standpoint, this case illustrates the indispensable value of a detailed postmortem examination. Without the autopsy, the cause of death might have been erroneously attributed to head injury or other nonspecific causes. Identifying the exact level and mechanism of spinal injury not only confirms the immediate cause of death but also informs public health interventions, such as enhancing seatbelt design, improving road infrastructure, and updating trauma care and accident reconstruction protocols (IATSS research, 2014). Moreover, the time of day may have played a role. Night time driving is associated with increased risk due to reduced visibility, fatigue, and higher incidence of alcohol-impaired driving. In this index case, toxicological study revealed high level of blood alcohol. Alcohol intoxication is a well-recognized risk factor in night time RTAs (Peck et al., 2008). Ultimately, the sudden and silent nature of this fatal injury serves as a critical reminder to emergency responders, clinicians, and forensic experts: minimal external trauma does not rule out severe internal injury. Proper cervical spine immobilization, high suspicion for internal trauma, and thorough postmortem evaluation are essential in every trauma-related fatality.

CONCLUSION

This case demonstrates that cervical spine injuries can be fatal even when external trauma appears trivial. It emphasizes the need for high suspicion of spinal injury in all high-impact trauma cases and reinforces the indispensable role of autopsy in revealing hidden causes of death. Education of first responders, adoption of cervical precautions, and road safety awareness remain critical in preventing such fatalities.

REFERENCES

1. Benzel. E. C., Hart, B. L., Ball, P. A., Baldwin, N. G., Orrison, W. W., & Espinosa, M. C. (1996). Magnetic resonance imaging for the evaluation of patients with occult cervical spine injury. Journal of Neurosurgery, 85(5), 824-829.
2. DiPompeo, C. M., & Das, J. M. (2023). Subaxial cervical spine fractures. In StatPearls. StatPearls Publishing. Retrieved June 13, 2025, from https://www.ncbi.nlm.nih.gov/books/NBK546617/
3. Fehlings, M. G., Vaccaro, A., Wilson, J. R., Singh, A., Cadotte, D. W., Harrop, J. S., et al. (2012). Early versus delayed decompression for traumatic cervical spinal cord injury: results of the Surgical Timing in Acute Spinal Cord Injury Study (STASCIS). *PloS ONE*, 7(2), e32037.
4. Hoffman, J. R., Mower, W. R., Wolfson, A.B., Todd. K. H., & Zucker, M. I.; National Emergency X-Radiography Utilization Study Group. (2000). Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. New England Journal of Medicine, 343(2), 94-99.
5. IATSS Research. (2014). Fatal traffic accidents and forensic medicine. IATSS Research, 38(1), 71-76.
6. Leucht, P., Fischer, K., Muhr, G., and Stübig, T. (2009). Epidemiology of traumatic spine fractures. *Injury*, 40(2), 166–172.
7. Lin, J.T., Lee, J.L., & Lee, S.T. (2003). Evaluation of occult cervical spine fractures on radiographs and CT.Emergency Radiology, 10(2), 128-134.
8. Peck, R.C., Gebers, M. a., Voas, R. B., and Romano, E. (2008). The relationship between blood alcohol concentration (BAC), age, and crash risk. *Journal of Safety Research, 39(3), 311-319.*
9. Radiology Assistant. (2008). *Cervical injuries: Neurology overview*. Retrieved June 10, 2025, from https://radiologyassistant.nl
10. Sacco, M.A., Verrina, M.C., Raffaele, R., Gratteri, S., Tarallo, A.P., et al. (2025).The role of autopsy in forensic and clinical evaluation of head and spinal trauma in road traffic accidents: A review of the literature. Diagnostics, 15(4), Article 442.
11. Stiell, I. G., Clement, C. M., McKnight, R. D., Brison, R., Schull, M., Rowe, B.H., et al. (2003). The Canadian C-spine rule versus the NEXUS low-risk criteria in patients with trauma. *New England Journal of Medicine*, 349(26), 2510–2518.
12. Wang, T. Y., Mehta, V. A., Dalton, T., Sankey, E. W., Goodwin, C. R., Karikari, I. O., et al. (2021). Biomechanics, evaluation, and management of subaxial cervical spine injuries: A comprehensive review of the literature. Journal of Neuroscience, 83, 131-139.
13. World Health Organization. (2018). Global status report on road safety 2018.
14. World Federation of Societies of Anaesthesiologists. (2013). *The unstable cervical spine (Anaesthesia Tutorial of the Week, No. 292)*. Retrieved June 10, 2025, from Resources. WFSAhq.org