



FATAL RAILWAY TRAUMA: A FORENSIC AUTOPSY CASE SERIES OF FATAL RAILWAY TRAUMA

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ABSTRACT

Background: Railway-related fatalities remain a major public health and medicolegal concern in developing countries. High-energy interaction between a moving train and the human body produces distinctive and often catastrophic injury patterns. Documentation of such patterns is essential for forensic reconstruction and determination of cause and manner of death. **Objective:** To present a forensic autopsy case series highlighting two fatal railway-related injuries-one involving extensive polytrauma with evisceration and traumatic amputations, and the other involving severe crushed facial injury-and to correlate the observed findings with established forensic literature. **Case Series:** Two adult male victims of alleged railway accidents were subjected to medicolegal autopsy. Case 1 demonstrated massive truncal and lower limb injuries with evisceration and traumatic amputations consistent with a run-over injury. Case 2 showed catastrophic destruction of facial structures with comminuted facial fractures indicative of high-energy blunt force impact. **Results:** In both cases, injuries were severe, mutilating, and incompatible with life. Deaths were attributed to hemorrhagic shock due to extensive trauma. The injury patterns correlated well with classical descriptions of railway fatalities. **Conclusion:** This case series reinforces the characteristic forensic features of railway-related deaths and underscores the importance of meticulous autopsy documentation for accurate medicolegal opinion.

KEYWORDS : Railway accident, Run-over injury, Crushed face, Polytrauma, Forensic autopsy

INTRODUCTION

Railway accidents account for a significant proportion of accidental and suicidal deaths in India. Victims may suffer extreme blunt force trauma due to crushing, shearing, and dragging forces exerted by moving trains. The resulting injuries are often extensive and mutilating, including traumatic amputations, evisceration, and severe craniofacial destruction. From a forensic standpoint, recognizing these injury patterns is crucial for reconstructing events, differentiating between accidental and suicidal manners of death, and providing sound medicolegal opinions⁵. This case series presents two contrasting but complementary fatal railway injury patterns observed during medicolegal autopsy.

Case 1: Fatal Railway Run-over With Polytrauma And Evisceration

Case History

An unidentified adult male was found lying on the railway track following an alleged run-over by a train. The body was brought for medicolegal autopsy. No reliable eyewitness account was available.

Autopsy Findings

External examination revealed extensive mutilating injuries predominantly involving the lower abdomen, pelvis, and lower limbs. The clothing was torn, blood-stained, and heavily contaminated with grease, soil, and railway ballast. A large irregular crushed wound was present over the lower abdomen and pelvic region with complete disruption of the abdominal wall, resulting in evisceration of abdominal contents. The wound margins were ragged, contused, and crushed with marked tissue loss, consistent with heavy blunt force trauma. Surrounding skin showed extensive abrasions, grease smearing, and embedded foreign materials. Both lower limbs exhibited severe crushing injuries with traumatic amputations at varying levels, exposing pulped muscles and shattered bones. The distribution and nature of injuries were asymmetrical and widespread, with no evidence of sharp-force injuries or defense wounds.

Internal examination showed massive disruption of the

abdominal and pelvic cavities. Abdominal organs including the liver and intestines were severely lacerated and contaminated with foreign material. The pelvic girdle was crushed with fragmentation of pelvic bones and destruction of pelvic organs. A large quantity of blood was present within the abdominal and pelvic cavities, indicating massive hemorrhage. The thoracic organs were congested; the heart appeared pale and relatively empty, consistent with hypovolemic shock. No natural disease sufficient to cause death was identified.

Cause Of Death

Death was due to **hemorrhagic shock resulting from multiple injuries sustained in a railway run-over accident**.



Fig 1: Image showing mutilated trunk and limbs

Case 2: Fatal Crushed Facial Injury due to Railway-Related Blunt Force Trauma

An unidentified adult male was recovered following an alleged railway-related incident and subjected to medicolegal autopsy. Circumstantial evidence suggested impact with a moving train or fixed railway structure.

Autopsy Findings

External examination revealed catastrophic destruction of the facial region with complete loss of normal facial contours. A large irregular gaping wound involved the midface and lower face, exposing comminuted maxillary and mandibular bones,

fractured and dislodged teeth, tongue, and oral cavity structures. The wound margins were irregular, contused, and crushed with extensive tissue loss. Facial muscles were pulped and hemorrhagic, and skin flaps were torn and displaced. Hair was matted with blood, and surrounding skin showed abrasions, contusions, and grease smearing suggestive of high-energy blunt force impact. No incised wounds or sharp-force injuries were observed.

On internal examination, the facial skeleton was extensively comminuted, involving the maxilla, mandible, nasal bones, and zygomatic arches. The oral cavity was disrupted with laceration of the tongue and floor of the mouth. Soft tissues of the face and upper neck showed extensive hemorrhage and crushing. The brain was congested without focal traumatic lesions sufficient to independently cause death. Upper airway structures were distorted due to facial collapse, contributing to airway compromise.

Cause of Death

Death was due to ****hemorrhagic shock with associated neurogenic shock resulting from severe crushed facial injuries caused by high-energy blunt force trauma****, consistent with a railway-related accident.



Fig 2: Destructed Face

DISCUSSION

Railway fatalities commonly exhibit severe and characteristic injury patterns due to the immense mass and velocity of trains. Run-over injuries, as demonstrated in Case 1, typically involve crushing and shearing forces producing traumatic amputations, evisceration, and extensive contamination of wounds with grease and ballast. Similar findings have been consistently reported in Indian and international forensic studies.

Craniofacial injuries, as illustrated in Case 2, occur when the head or face directly impacts a moving train or fixed railway structure. Facial bones, due to their complex but delicate architecture, are prone to comminution under high-energy blunt force. The presence of crushed wound margins, fractured teeth, and pulped facial tissues strongly supports blunt force trauma rather than sharp force injury.

Previous studies from India have reported that lower limbs and pelvis are most frequently involved, particularly in victims struck or run over while crossing tracks. The presence of grease marks and embedded foreign material is considered highly suggestive of railway wheel contact. Similar observations were documented by Reddy¹ and Murty, Karmakar², and other forensic authors like Mohanty⁴, who emphasized that such injuries are usually instantaneous and incompatible with life.

Both cases highlight that such injuries are rapidly fatal and often incompatible with life. Although differentiation between accidental and suicidal railway deaths relies heavily on circumstantial evidence, the injury patterns in these cases are consistent with accidental railway trauma as described in

Saukko P, Knight B³

CONCLUSION

This case series highlights two distinct yet classical patterns of fatal railway-related trauma: extensive polytrauma with evisceration and traumatic amputations, and catastrophic crushed facial injury. Thorough autopsy examination and documentation of these injuries are essential for accurate determination of cause and manner of death and for contributing to forensic education and preventive strategies.

REFERENCES

1. Reddy KSN, Murty OP. *The Essentials of Forensic Medicine and Toxicology**. 34th ed. New Delhi: Jaypee Brothers Medical Publishers; 2017.
2. Karmakar RN. *Forensic Medicine and Toxicology**. 4th ed. Kolkata: Academic Publishers; 2014.
3. Saukko P, Knight B. *Knight's Forensic Pathology**. 4th ed. Boca Raton: CRC Press; 2016.
4. Mohanty MK, Panigrahi MK. Fatal railway injuries: a retrospective study. *Med Sci Law**. 2004;44(4):332–336.
5. Aggarwal NK. Pattern of injuries in railway fatalities: a forensic perspective. *J Forensic Med Toxicol**. 2011;28(1):15–20.