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Excavation of the chest due to railway mishap

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Injuries sustained due to railway mishaps are well documented. In these mishaps, ascertaining the cause of death is usually not difficult, but frequently circumstances do raise questions as to the manner of death. It is a real challenge for an autopsy surgeon to correlate the alleged history with injuries present on the body, thereby helping the investigating officer to come to a conclusion on the manner of death. Here, we present a case of an unusual excavation injury to the chest due to train impact, and discuss the mechanism of causation of this injury and the manner of death.

Keywords: railway mishap; railway accident; railway suicide; train–pedestrian collision

Introduction

Railway mishaps involving pedestrians can be devastating, and usually result in death or irreparable damage such as amputation or paralysis¹. Many of these fatalities do not raise any medico-legal questions as most of these events are witnessed. In some cases, however, the expertise of an autopsy surgeon is sought for a logical and fair conclusion as to the manner and nature of the injuries sustained. The autopsy surgeon is expected to be aware of the injuries that are associated with the railway mishaps, both typical and atypical, and to help the investigating authorities. Here, we present a case where a dead body was found on the railway track with an unusual chest injury and we discuss the mechanism of causation of this injury.

Case report

An unknown elderly male was found dead on a railway track about 5 km away from a railway station with alleged history of being crushed by a speeding train. The body was found obliquely, in supine position, between the tracks with an amputated right forearm on one metal railing and amputated left leg on the other metal railing (Figure 1).

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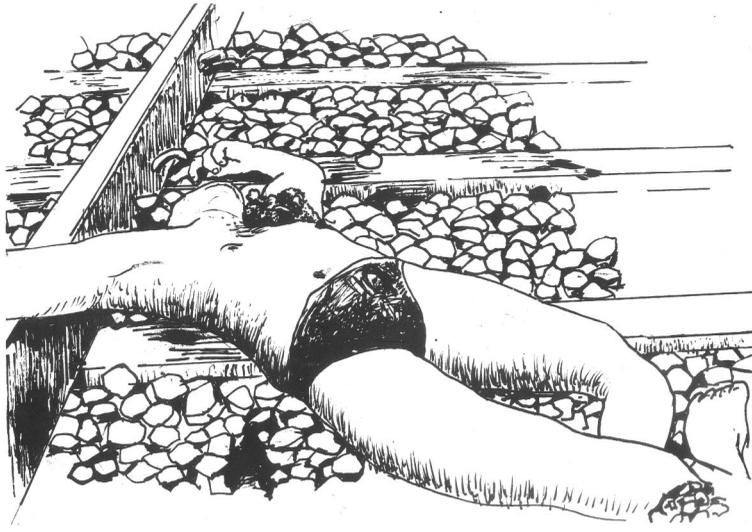


Figure 1. Sketch depicting the position of the body as found on the railway track.

On post-mortem examination, length of the body measured 162 cm on alignment of the amputated legs. Grease particles were adhered over the face and trunk. Multiple vitiligo patches were present over the lower parts of the legs and feet. The following external injuries were present on the body.

- The face was disfigured with multiple lacerations over the scalp and face, along with the absence of both eyeballs from the eye sockets, a grazed-abrasion measuring 8 cm × 6 cm over the right side of the face, a laceration measuring 5 cm × 1 cm × bone deep over the left jaw region, and a fracture of the mandible on both sides.
- A semi-circular avulsed laceration measuring 24 cm × 13 cm was present over the anterior surface of the left upper chest exposing the left pleural cavity (Figure 2). The skin, muscle and fractured ribs were heaped up at the supero-lateral part of the left upper chest with grease particles adhered over the margins. The wound was directed from postero-medial to supero-lateral side.
- Multiple abrasions and contusions were present over the front of the chest and abdomen. A grazed-abrasion measuring 25 cm × 20 cm was present vertically over the antero-lateral surface of the right side of the trunk. A grazed-abrasion measuring 10 × 8 cm was present vertically over the posterior surface of the left upper abdomen.
- The left upper limb was deformed with fractures of the humerus, radius and ulna at multiple places. The right upper limb was amputated at the level of the upper forearm, exposing the lacerated muscles, vessels and fractured bones. The amputated right hand was found separately by the side of railway track.
- The left leg was amputated at its upper part, exposing lacerated muscles, vessels and fractured bones. The right leg was fractured at its middle part with laceration of skin, and the lower part of the leg was attached with a skin tag. Both thighs were deformed with fractures of femurs at the middle part.

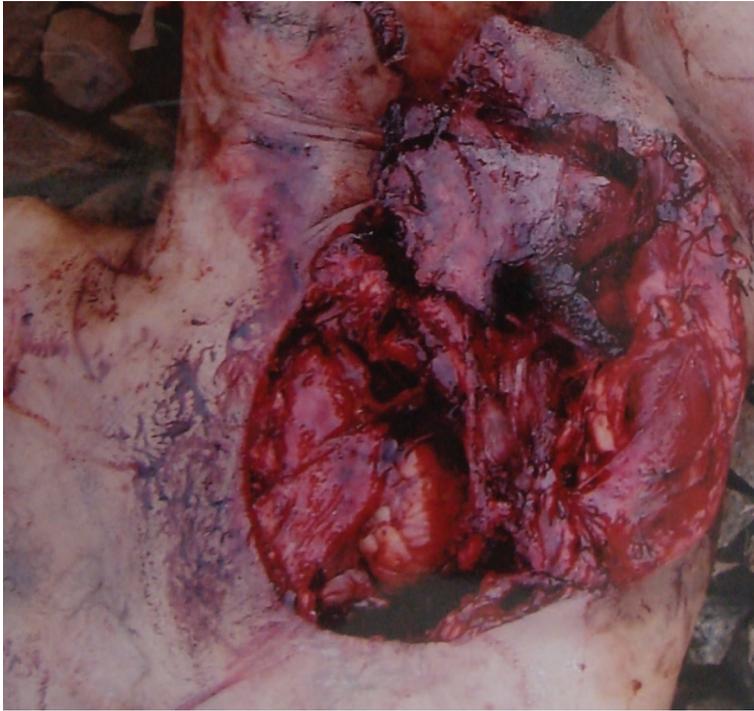


Figure 2. Excavation injury of the chest. (Note: Clothes were removed by the police for preliminary investigation).

Internal examination revealed multiple fractures of the skull with an opening of the vault exposing remnants of lacerated brain at the base of cranial cavity. The first to tenth ribs on both sides and the sternum were fractured at multiple places. Multiple lacerations and contusions were present over the lateral and posterior surfaces of the right lung. The left lung was transected from the hilum and was found outside the cavity. The heart was lacerated horizontally along the interventricular septum with missing of the lower part and contusion of the base of ascending aorta. The diaphragm was lacerated on both sides with diffuse contusion of peritoneum. The stomach contained yellowish-brown colored liquid with non-specific odor. Multiple mesenteric contusions were present with intact intestinal coils. The liver was ruptured. The spleen and kidneys were intact and pale. All the injuries showed features of ante-mortem infliction.

Routine viscera were preserved and sent to a forensic science laboratory, which did not reveal any toxic substance. The final opinion as to the cause of death was ascertained as multiple injuries sustained to the head and chest as a result of blunt force trauma.

Discussion

Pedestrian–train collisions are usually accidental in nature, and occur after dusk when pedestrians cross the railway track to reach their destination through the nearest route or stroll along the railway tracks for leisure or recreation purposes²⁻⁵.

Railway suicides are usually committed by lying across the railway track, or walking or jumping in front of an approaching train, and are commonly seen during the daytime and in densely populated areas^{4,6}. Although alcohol is an important risk factor in railway accidents, a positive blood alcohol content and a psychiatric illness is often present in suicide victims^{3,7,8}.

Extensive blunt force injuries, especially traumatic amputations of an upper or lower extremity are commonly seen in railway accidents^{6,9,10}. Massive blunt force trauma with alcohol intoxication is highly suggestive of an accidental death^{3,7}. Similar injuries can be encountered in suicides, which are committed by jumping in front of the train, whereas transverse sectioning of the body at the neck, trunk or extremities is commonly observed when the victim lies across the railway track. Decapitation with no other injury is considered typical of a suicide^{2,3,11}. Classically, complete transections are associated with irregular, ragged and sharp-edged wound margins with a zone of skin abrasion and contusion. In incomplete transection, bridging of vascular and nervous pathways may be present at the depth of the wound¹².

It is important to rule out homicide in all cases, which is often disguised as an accident or suicide. Railway homicides can be achieved by either pushing a person under a train, or leaving him or her unconscious on a railway track. Sometimes, dead bodies are disposed of on a railway track after killing by other means, to simulate a suicide or an accident⁶. Here, careful evaluation of the history, scene investigation, autopsy findings, and toxicological data help in deciding the manner of death.

In the present case, multiple injuries were present over the body with adhered grease particles, which is typical of a railway mishap. This was an un-witnessed event and was also not reported by any train driver, therefore this could have occurred during night. Injuries to the head, thorax and left upper limb indicate that the primary impact of the train was over the upper part of the body. A peculiar semicircular wound was present over the anterior surface of the left chest with the opening of the thoracic cavity; the margin of this wound appeared to be incised, but on examination with a magnifying lens it was found to be a laceration. The skin, muscle and rib cage were heaped up at the supero-lateral part of the left chest. A visit to the scene of the incident did not reveal any useful information to explain the mechanism of causation of this chest injury. Later, the railway yard was visited to examine the train engine for projecting parts. The front of the engine had two projections, one on each corner called 'buffers', which act as shock absorbers (Figure 3). They are projections circular in shape, measuring 45 cm in diameter. The lower margin of the buffer was 102 cm above ground level and 88 cm from the metal railings/railway track. The distance between the heel and lower margin of the injury on the left chest measured 105 cm, which corresponded to the distance of the buffer from the ground, especially if the victim would have been in upright position. This affirms that the injury on the left chest was due to the impact of a protruding buffer of the train engine. After an initial impact, the body could have been thrown on to the railway track followed by being run over by the train. Hence, it can be deduced that the victim was alive and was in a standing position at the time of the incident. The postmortem examination did not show any evidence of prior assault, such as a gunshot wound, compression of neck etc. In addition, chemical analysis ruled out the possibility of poisoning prior to death. So, it can be inferred that the manner of death is either an accident or suicide. The presence of a suicide note could have given useful insight to come to the conclusion of suicide. However, it is worth noting that it is virtually impossible to rule out the possibility that the person/body was thrown



Figure 3. Railway engine showing circular buffers at the corners.

into the path of the train – which is usually proved by an eye witness. We conclude that the role of autopsy surgeon investigating deaths due to railway accidents is important and has to be supplemented by a crime scene visit, eyewitness accounts and any other corroboratory evidence that is available.

References

1. Lerer LB, Matzopoulos R. Meeting the challenge of railway injury in a South African city. *Lancet*. 1996;348:664–666.
2. Mohanty MK, Panigrahi MK, Mohanty S, Patnaik KK. Death due to traumatic railway injury. *Med Sci Law*. 2007;47:156–160.
3. Cina SJ, Koelpin JL, Nichols CA, Conradi SE. A decade of train-pedestrian fatalities: the Charleston experience. *J Forensic Sci*. 1994;39:668–673.
4. Rådbo H, Svedung I, Andersson R. Suicides and other fatalities from train-person collisions on Swedish railroads: a descriptive epidemiologic analysis as a basis for systems-oriented prevention. *J Safety Res*. 2005;36:423–428.

5. Loumiet JR. Pedestrians and pedestrian-accident counter measures. In: Loumiet JR, Jungbauer WG, editors. Train accident reconstruction and FELA and railroad litigations. Tucson: Lawyers and Judges Publishing; 2005. p. 139–142.
6. Pentilla A, Lunetta P. Transportation medicine. In: Payne-James J, Busuttill A, Smock W, editors. Forensic medicine: clinical and pathological aspects. London: Greenwich Medical Media; 2003. p. 525–542.
7. Matzopoulos R, Peden M, Bradshaw D, Jordaan E. Alcohol as a risk factor for unintentional rail injury fatalities during daylight hours. *Int J Inj Contr Saf Promot.* 2006;13:81–88.
8. De Leo D, Kryszynska K. Suicidal behaviour by train collision in Queensland, 1990–2004. *Aust NZ J Psychiatry.* 2008;42:772–779.
9. Lerer LB, Matzopoulos RG. Fatal railway injuries in Cape Town, South Africa. *Am J Forensic Med Pathol.* 1997;18:144–147.
10. Shapiro MJ, Luchtefeld WB, Durham RM, Mazuski JE. Traumatic train injuries. *Am J Emerg Med.* 1994;12:92–93.
11. Arun M, Palimar V, Kumar GNP, Menezes RG. Unusual methods of suicide: complexities in investigation. *Med Sci Law.* 2010;50:149–153.
12. Tsokos M, Türk EE, Uchigasaki S, Püschel K. Pathologic features of suicidal complete decapitations. *Forensic Sci Int.* 2004;139:95–102.