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Case Report

Medico-Legal Autopsy Case of Fatal Traumatic Injuries in a Pedestrian sustained from a Road Traffic Accident caused by Impact with a Stray Dog

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ABSTRACT

Background: Road traffic accidents (RTAs) are a serious social problem, both for individuals and their families, and have their own importance for the protection of public health.

Case Presentation: In the interest of such fatality and morbidity, we present a case of a fatal road traffic accident of a man struck by a stray dog hit by a vehicle at high speed. Even in the field of Forensic Medicine, such cases are an increased level of expert difficulty; that's why for correct interpretation of the manner of crime and mechanism of injuries, systematic and complex detailed analysis must be performed, including crime scene examination, evidence analysis, rich autopsy assessment, and additional video surveillance analysis.

Conclusion: Recent case report shows that a systematic approach remains essential for increasing road safety and protecting vulnerable road users.

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Introduction

Road traffic accidents (RTAs) are a serious social problem, both for individuals and their families, and have their own importance for the protection of public health. In the interest of such fatality and morbidity, various risk factors should be analyzed and evaluated for effective prevention [1, 2]. Every year, millions of people worldwide lose their lives on the roads and suffer serious injuries, most of which require long-term treatment and rehabilitation [3, 4]. The incidence of road traffic accidents is steadily increasing, and this trend is particularly pronounced in developing countries, such as those in Eastern Europe. Stray dogs are often involved in road traffic accidents and rarely cause fatal accidents involving other participants; however, they are frequently victims of such accidents themselves [5-7]. The given case shows a rare manifestation of pedestrian fatality involving a stray dog, in the process of interaction with a moving vehicle.

Case Presentation

We present a case of a fatal road traffic accident of a man struck by a stray dog hit by a vehicle at high speed. A video recording from a nearby traffic control camera was analyzed during the investigation of the criminal case, effectively reconstructing the crime in action (Scenes 1-4).

The case is a male who was of apparent age corresponding approximately to his calendar age, moderately nourished, with normally developed skeletal and muscular systems. During the autopsy, the following findings were established:

External examination/external autopsy findings: The skin was pale and cold, and postmortem lividity was located over the non-compressed areas of the back, buttocks, and lower extremities. Rigor mortis was moderate in all muscle groups and relatively difficult to overcome. Investigation of the chest region showed palpation of rib fractures on both the left and right sides. Two abrasions were identified in the midline: one reddish, linear, measuring 0.2×4.0 cm, with a scab at the level of the surrounding tissue; the other was located above it, with similar characteristics, measuring 0.2×2.0 cm (Figure 1).

Internal examination and internal autopsy findings

During the examination of the cranial cavity over the convexity of both cerebral hemispheres, on all surfaces, a diffuse, sheet-like reddish hemorrhage was observed, with a layer thickness reaching up to 0.5 cm (Figure 2), while bones forming the skull were intact.

Inspection of the chest cavity showed, in several areas, on both the left and right lungs, lacerations measuring from 1.0 cm to 3.0 cm in length, while in the region of the base of the main bronchi, there was bilateral massive hemorrhage, with bilateral peripheral lacerations measuring 4 cm in length each. The thoracic skeleton showed loss of integrity, there was a fracture of the sternum in its middle third in combination with multiple rib fractures: on the right side- ribs 2-6 along the parasternal line and ribs 4-12 along the

Scenes 1. 1-4, The reconstruction of the RTA. Scene 1: The man is walking on the road. Scene 2: It shows the vehicle hitting a stray dog at a nearby crossing. Scene 3: It shows the dog impacting the pedestrian. Scene 4: It shows the pedestrian falling on the ground.

Figure 1. Showing traumatic findings over the skin in the chest area.

paravertebral line; on the left side- ribs 2- 6 along the parasternal line, the 5th and 6th ribs along the midclavicular line, and ribs 3-6 along the paravertebral line, with associated soft tissue contusions around them (Figure 3). Approximately 450 milliliters of liquid blood were found in the left pleural cavity.

The liver was of normal shape and size but showed disrupted integrity; it was multifragmentary, with lacerations measuring up to 12.0 cm in length that

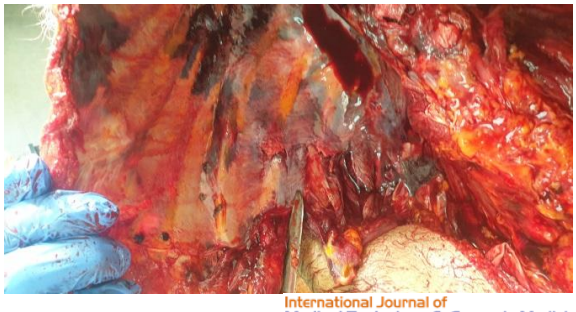

Figure 3. Showing traumatic changes inside the chest cavity.

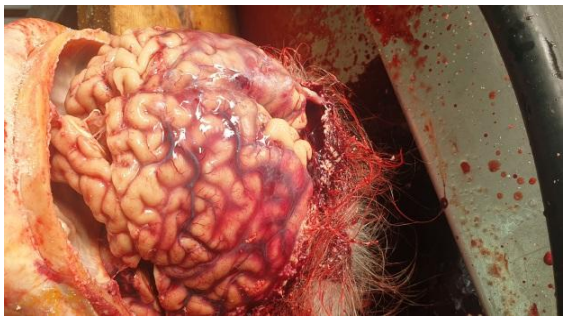

Figure 2. Showing brain injuries inside the cranial cavity.

merged with one another (Figure 4). The capsule of the organ was also torn, with irregular and blood-infiltrated edges. The right kidney was found to have a blood-imbibed capsule; upon decapsulation, parenchymal disruption (renal tissue) was observed (Figure 5). The left kidney showed no remarkable findings. The pelvic bones were intact, but in the abdominal cavity and the lesser pelvis, blood collections of approximately 650 ml were identified. The spine showed disrupted integrity with fracture of L1 (first lumbar vertebra) with involvement of the spinal cord, without complete transection (Figure 6). After deep incisions of the soft tissues in the lumbar region, traumatic hemorrhagic infiltration of the tissues was established at a height of 87 cm to 97 cm, measured from the right heel (Figure 7).

Based on the detailed autopsy examination, the cause of death in the present case was determined as severe combined cranial, thoracic, abdominal, and musculoskeletal trauma incompatible with life, and all

Figure 4. Showing many traumatic ruptures of the liver.

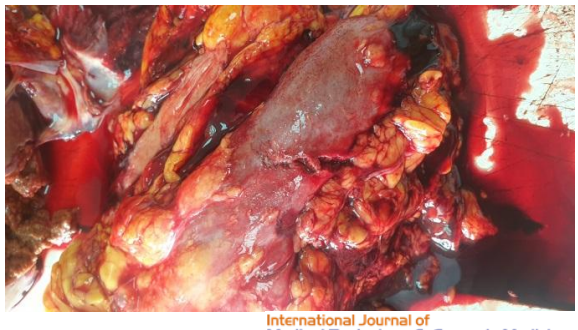

Figure 5. Showing described injuries to the kidney.

Figure 6. Showing fracture of L1.

Figure 7. Showing soft tissue injuries to the lumbar area.

Figure 8. The stray dog on the crime scene.

traumatic injuries were sustained as a result of the interaction with a hard, blunt object with very high kinetic energy.

The autopsy report of the stray dog (Figure 8) showed severe combined trauma to the chest and abdominal cavities with injuries to internal organs and vertebral column, which are not compatible with life, produced by a direct blunt force mechanism and forces of sudden acceleration/deceleration of the animal's body by an indirect mechanism.

Discussion

This case examines the circumstances and contributing factors in the process of crime investigation surrounding a fatal road traffic accident involving a pedestrian and a stray dog, hit by a light vehicle with high energy of impact. All autopsy findings in the animal and the pedestrian male strongly correspond to a high-energy impact with interaction within the animal and the moving vehicle, resulting in not suitable with life traumatic injuries for both the participants- the animal and the pedestrian.

The findings highlight the complex interplay among human behavior, the presence of animals on roadways, and the systemic management and control of traffic. Fatal incidents of this nature are often multifactorial; they are also rare, and the case shows how even a brief and unpredictable interaction can escalate into a lethal event.

A major contributing factor identified in this case is the role of stray animals in traffic. In many low- and middle-income countries, especially in the Republic of Bulgaria, high populations of unrestrained dogs contribute significantly to road hazards. The sudden movement of a stray dog onto the roadway usually provokes unexpected driver maneuvers, including abrupt braking and changes in vehicle direction, thereby increasing the likelihood of collisions. On the other hand, pedestrians could enter traffic lanes to avoid interacting with stray dogs. Similar patterns have been reported in studies conducted in urban areas of countries worldwide (5, 8-10). Pedestrians likely underestimate the risks associated with roadside animals, particularly in environments. From the driver's perspective, reaction time and decision-making under sudden hazard conditions are critical determinants of outcome severity. Even at moderate speeds, limited braking distance combined with delayed hazard perception can result in fatal injuries, and these contributing factors are described in the forensic literature (11).

Factors related to the road, such as poor street lighting, a lack of pedestrian crossings, and the absence of traffic speed-reduction measures, may significantly increase the risk of a collision. International road safety

frameworks, such as those promoted by the World Health Organization, emphasize the importance of safe system approaches (12). While collisions involving stray animals may account for a smaller proportion of total fatalities, they are entirely preventable through complex strategies. Effective stray dog population control programs—including sterilization and vaccination can seriously reduce roadside animal presence. Concurrently, enhanced enforcement of speed regulations in high pedestrian-density areas may seriously decrease the risk of morbidity and fatality.

This case also underscores the need for multisectoral collaboration within the municipal authorities, veterinary public health services, and traffic enforcement agencies (13). Even in the field of Forensic Medicine, such cases are an increased level of expert difficulty; that's why for correct interpretation of the manner of crime and mechanism of injuries, systematic and complex detailed analysis must be performed, including crime scene examination, evidence analysis, rich autopsy assessment, and additional video surveillance analysis.

From a legal point of view, this case study examines a complex chain of causation in which a pedestrian's death is caused by the indirect impact of a vehicle through an intermediary object - a stray dog. From the objective side, the vehicle remains the instrument of the crime, as it is the primary source of the kinetic energy that led to the statutory outcome, comprising the primary and secondary impacts and the pedestrian's subsequent death. The displaced animal is not an independent instrument but rather an intervening element within the causal process initiated by the traffic violation. The legal qualification should be directed toward negligent homicide arising from the operation of a motor vehicle, as the final statutory result absorbs the preceding bodily injuries.

Conclusion

This forensic case study demonstrates that various complex measures, such as controlling the stray animal population, improving road infrastructure, implementing speed control measures, and providing additional public education to raise awareness on the roads, are essential steps to reduce such tragedies. A systemic approach remains essential for increasing road safety and protecting vulnerable road users.

Conflicts of Interest

The authors report there are no competing interests to declare.

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