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CASE REPORT

DEATHS DUE TO WILD ELEPHANT ATTACK - A CASE SERIES

Geetha KB, Jayanth SH*, Prakash M
Dr Chandramma Dayananda Sagar Institute of Medical Education and Research, Dayananda Sagar University, Devarakaggalahalli, Ramanagara District, Karnataka, India

ABSTRACT

Human fatalities caused by wild elephant attacks in India are increasing and are more common in areas close to elephant habitats. Victims are villagers who reside in settlements close to forest reserves. Although they are aware of the presence of elephants in their neighbourhood, they often enter forests to feed cattle or collect firewood. Here, we report three cases of adult males from villages near forests who were attacked by wild elephants. These cases are rather uncommon when compared to other types of cases autopsied at our centre, as during the attack, all three were alone and in remote places where timely help was not feasible. All succumbed to polytrauma, mainly crush injuries involving large areas of the body, and their bodies were found later by forest guards. Though there were no eyewitnesses to these incidents, autopsy findings and circumstantial evidence ruled out other causes for these types of crush injuries, and the cause of death was attributed to an elephant attack.

Keywords: ***Asiatic elephant; autopsy; death; forensic medicine; wild animal***

Corresponding Author: Jayanth SH
veejay02@gmail.com
https://orcid.org/0000-0001-5209-1133

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INTRODUCTION

Karnataka is one of the southern states of India, which has a significant population of Asian elephants. Cauvery Wildlife Sanctuary is a protected area located in Southern Karnataka, which is home to many wild animals, including Indian elephants[1]. According to a survey done in 2012, the population of elephants in the Mysore Elephant Range in South Karnataka was 6072, and there were about 169 elephants in Ramanagara District[2]. There are eight villages enclosed and thirty within a radius of 5 km from the sanctuary, which has a total population of approximately 39,000, whose main occupation is farming and cattle rearing[1]. Humans and elephants co-exist in these settlements and can sometimes cause conflicts. When threatened, surprised, or while protecting their young ones, elephants attack humans and cause severe, life-threatening injuries.

The immense force of an elephant's weight and strength can cause fatal external and internal injuries. These types of cases are limited to some parts of the world with elephant habitat, and this case series aims to contribute to the existing literature by presenting a collection of cases highlighting the pattern of injuries and deaths caused by elephant attacks.

All three cases were found dead by the forest rangers in the vicinity of forests in Ramanagara, District of Karnataka and were subjected to postmortem examination at the Department of Forensic Medicine, Dr. Chandramma Dayananda

Sagar Institute of Medical Education and Research, Ramanagara District, Southern Karnataka, India.

CASE HISTORY

Case No. 1:

A 61-year-old male from "Gullatti Kavalu" village had gone to Bannerghatta Forest Reserve, which is nearby, in search of his cow on 27th February 2023. He was reported missing and was found dead by forest guards on 1st March 2023 near the forest area at about 1030 hrs. An elephant attack was suspected.

An autopsy was conducted on 2nd March 2023. The body was in a decomposed state. External injuries ranged from abrasions to fractures. Multiple abraded contusions were seen over the face, scalp, the back of the right elbow, wrist, right ankle, and both upper and lower limbs. Only one lacerated wound was seen over the inner aspect of the lower lip, with fracture dislocation of the angle of the mandible. Ribs were fractured on both sides: 2nd to 7th on the right side and 3rd to 5th on the left side. Multiple lacerations were seen over both lungs. The cause of death was multiple injuries sustained by blunt trauma. Considering the police investigation findings and autopsy findings, blunt injuries were attributed to an elephant attack.

Case No. 2:

A 55-year-old male from "Kodihalli" village had gone to graze his sheep on 25th December 2023 in the morning. He did not return home till evening. His body was found by forest guards, with suspicion of being trampled by an elephant in the fields on 27th December 2023. Elephant dung was also present near the body (Fig. 1). Coils of intestines and fractured bones of the left leg were also visible (Fig. 2).

A postmortem examination was conducted on 28th December 2023. The body was discoloured, and the skin was peeling off. Maggots were seen over the body, each measuring 0.5 to 1 cm in length, showing signs of decomposition. Multiple crush injuries were seen over the abdomen and lower limbs, exposing the underlying fractured bones, lacerated muscles, vessels, nerves, coils of intestine, and lacerated lungs, liver, and kidneys (Fig. 3). A ruptured heart and urinary bladder were also seen. All ribs were fractured at the outer angle; the sternum, scapula, and clavicle were fractured and dislocated. Cervical vertebrae 3 and 4 (C_3 and C_4), thoracic vertebrae 2 and 4 (T_2 and T_4), and pelvic bones were fractured. The cause of death was multiple injuries sustained by blunt trauma. Considering the facts provided by the police and autopsy findings, blunt injuries were attributed to an elephant attack.

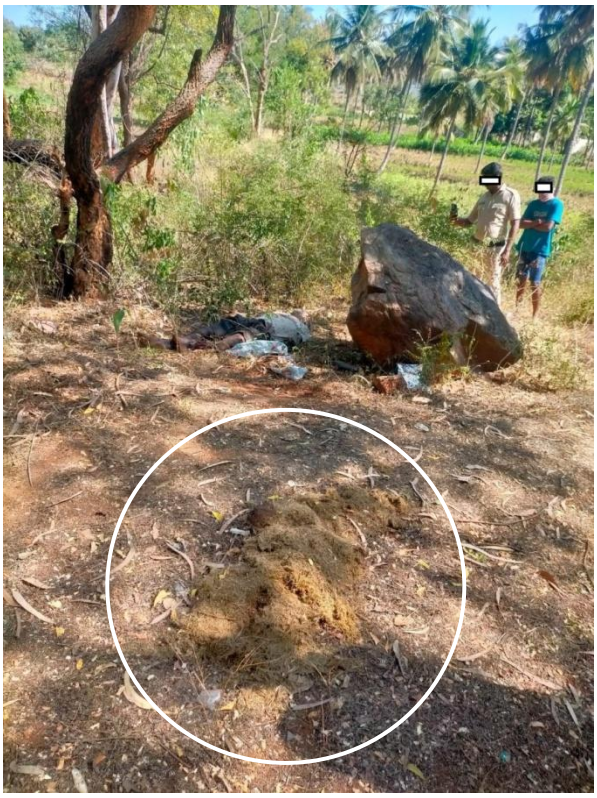

Figure 1: Elephant dung (circled) present at the place where the body was found.

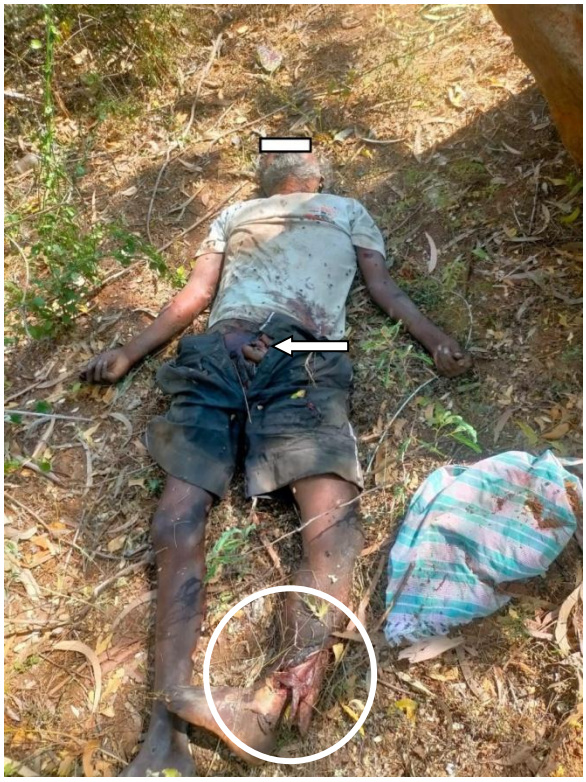

Figure 2: Fracture of bones of left leg (circled) with visible coils of intestines (arrow).

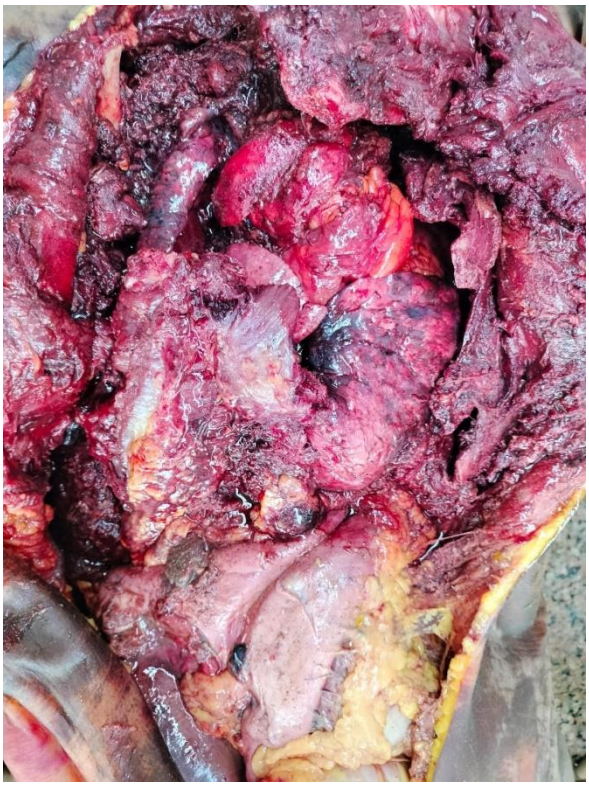

Figure 3: Thoracic cavity showing crushed and displaced organs.

Case No. 3:

A 38-year-old male had gone to his agricultural fields to water mulberry plants at around 0300 hours on 6th July 2024. He was suspected of having been attacked by a wild elephant (Fig. 4).

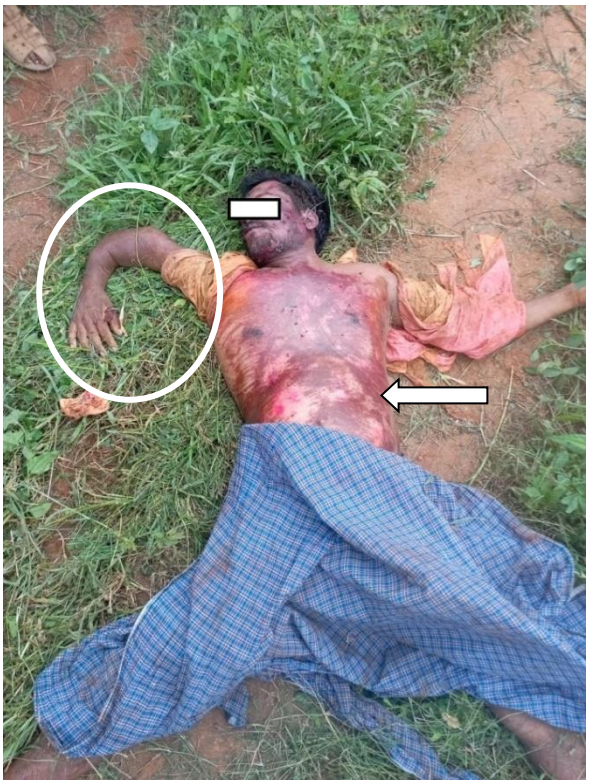

Figure 4: Body when found showing torn shirt, deformed right upper limb (circled), and contusions over chest and abdomen (arrow).

An autopsy was performed on 6th July 2024. The deceased was moderately built and nourished. Externally, injuries ranged from multiple abraded contusions to lacerations and were present over the head, trunk, as well as both upper and lower limbs (Fig. 5).

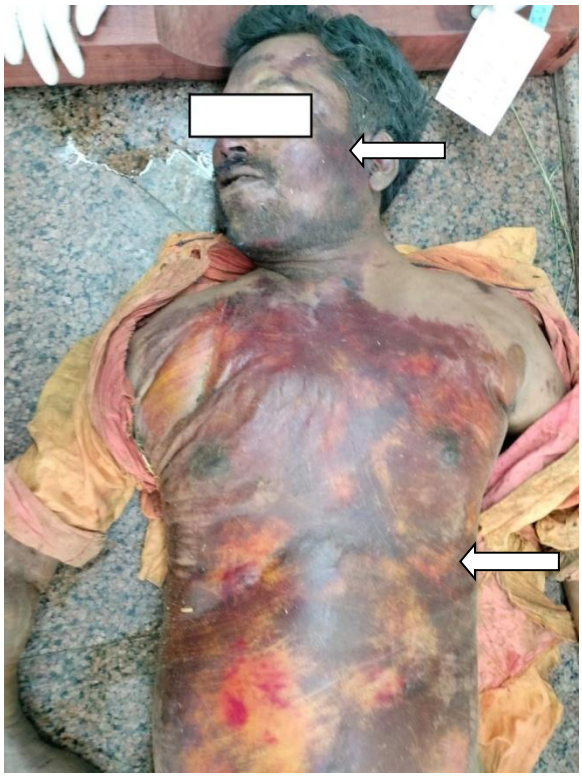

Figure 5: Multiple contusions present over the head and trunk (arrows)

Underlying bones of the cranium, ribs, and limb bones were fractured. Internal structures in the neck, thorax, and abdomen were crushed and displaced (Fig. 6).

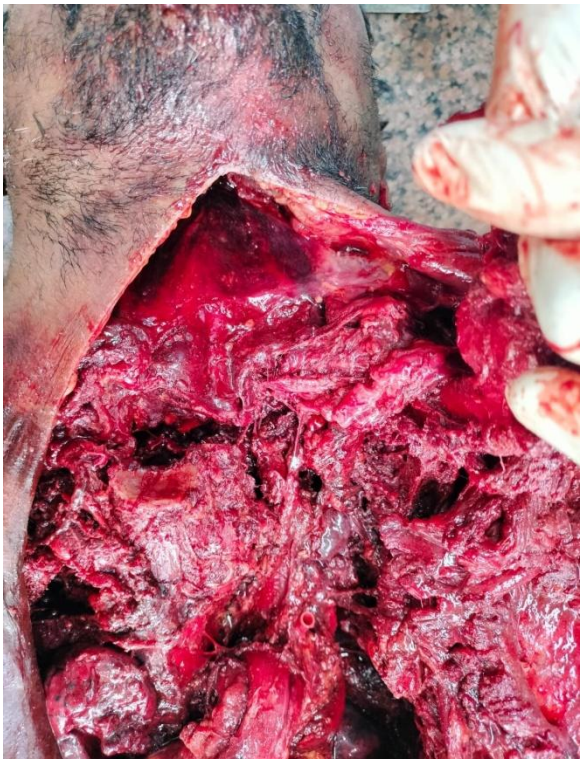

Figure 6: Crushed neck structures

The scrotum was swollen, and the testes were contused. Cervical vertebrae 5 to 7 (C_5 to C_7), lumbar vertebrae 4 and 5 (L_4 and L_5), and pelvic bones were fractured into multiple pieces.

The brain was covered with subdural and subarachnoid haemorrhages. Both lungs were lacerated into multiple pieces. The heart showed a laceration over the left ventricle. Mesenteric contusion was seen. The liver and spleen showed multiple lacerations. Both kidneys were contused. The cause of death was multiple injuries sustained by blunt trauma. It was concluded to be because of an elephant attack based on circumstantial evidence, autopsy findings, and ruling out other causes for these types of crush injuries in this circumstance.

DISCUSSION

Agriculture is the prime occupation in rural India, and there are many human settlements and agricultural lands in the close vicinity of forest reserves. Villagers venture into the forest for the collection of firewood, minor forest produce, and the grazing of cattle. In Karnataka, these activities contribute to the livelihoods of many tribal and indigenous communities. Ramanagara district in Southern India, where our institution is located, has a significant number of wild elephants. The perimeter of elephant reserves has been fortified with solar-powered wire fences, rubble walls, and elephant-proof ditches. However, these are inefficient[2]. More frequently, elephants are seen near the villages crossing roads, and there is sometimes unauthorised entry of villagers into the forest areas. This has resulted in an increase in human-elephant conflicts in places where there are forest reserves.

Human-elephant conflicts resulted in 2,853 human deaths during the past five years, with the number of fatalities reaching a five-year high of 628 in 2023, according to government data. The data revealed that Odisha recorded 624 such deaths during this period, followed by Jharkhand with 474, West Bengal with 436, Assam with 383, Chhattisgarh with 303, Tamil Nadu with 256, Karnataka with 160, and Kerala with 124[3]. In Myanmar, between 2001 and 2020, 143 cases of elephant-caused human mortality were recorded[4].

Attacks by elephants occur most commonly in farmlands, near homes, or in forests when people intrude on their habitat[5]. Higher human density and dependency on forest resources are causative factors. In addition, people who live near elephant migration routes are more vulnerable to elephant attacks[4]. Most victims are marginalised people who live along the forest fringes. Resource competition is, therefore, likely the main reason for human mortality[6]. Elephants use their trunk, feet, or tusks to inflict injury on humans. Among Indian elephants, only male elephants have tusks, whereas in African elephants, both males and females have tusks.

In a tertiary rural hospital like ours, we rarely come across cases suspected to have succumbed to an elephant attack. Only three cases were reported and brought to our centre in the last five years. In all three cases examined at our centre, victims were adult males, and they were in places near known elephant habitat for their livelihood. They were from rural India, where cattle rearing and agriculture are the main sources of income. In a study done in West Bengal, another Indian state with a high elephant population, all 14 victims were from the rural areas and belonged to the low socioeconomic group. The ages of the deceased were between 30 and 65 years, with 11 of them being above 40 years. Males comprised 78.5% (11) of the victims[6].

Most of the injuries seen were crush injuries to the chest, abdomen, and pelvic region, sparing the head. Among fractures, rib fractures were common in all cases, followed by fractures of the extremities. Last were vertebral fractures. Soft tissue injuries like multiple lacerations were seen in all the cases, exposing the underlying injured structures and organs. Internal injuries in the form of contusions and lacerations were observed in all the thoracic and abdominal organs, commonly affecting the lungs, liver, and heart. The spleen, kidneys, and testes were also injured in at least one case. In all cases, blunt force injuries affected large surface areas of the body, and external injuries were conspicuously crush injuries. There were no patterned contusions to suggest a different type of trauma, such as a run-over road traffic accident, and there were no defence injuries present. The death scene investigation did not reveal any other footprints or tread marks of any vehicular movements. These findings, along with police investigation reports, ruled out road traffic accidents and gang assaults.

Elephants primarily target the chest and head regions. However, they lack specificity due to their massive size, hence causing injuries over a large surface area[7]. In our cases, there were no crush injuries to the head, but there were contusions, lacerations, and fractures. Complete transection of the pancreas was observed in a case who survived[8]. Singh *et al.,* in their study on victims of elephant attacks, have observed that blunt injuries to the chest and abdomen predominated along with extremity injuries[9]. Injuries were mild to moderate in severity and involved the chest in common in three survivors of elephant attacks in Odisha, India[10].

The large size and body weight of elephants and the severity of impact during attacks make the injuries caused by them different from those due to other animal attacks. Immense force and momentum are generated by the weight and speed of the elephant during the attack (on average 6 tonnes and 15 miles per hour, respectively). This leads to lethal crush injuries and fractures in humans. Severe blunt injuries to the trunk or head are caused by trampling, stomping, squeezing, tossing, or crushing[7]. The tusker, or male Indian elephant, can cause impaling injuries like stab injuries and penetrative injuries to the abdomen and thorax. When the elephant's foot comes in contact with the victim, the mere weight of the elephant produces severe compressive forces on the body, causing direct trauma and crush injuries. As the elephant's foot moves over the victim, friction and shear forces cause other blunt force injuries to soft tissues. The type of injuries varies from severe maxillofacial trauma and perforating lacerated tusk injury of the chest with multiple rib fractures to blunt intra-abdominal trauma, including bowel transection, liver and abdominal aorta lacerations, and pelvic fractures[11]. Injuries by elephants differ from those by other animals due to the severity of the impact. Gross facial and bodily deformity and the involvement of a larger area of the body are characteristics that often result in fatality[12].

Various factors influence the severity of injuries, viz., proximity of the victim to the elephant's path, victim's position (standing, sitting, or lying down), duration and repetition of trampling, speed of rolling, and weight of the elephant. The majority of the injuries, especially crush injuries, are caused by trampling, and others, like abrasions, contusions, lacerations, and fractures, are caused by trunk impact and trunk compression. Lack of eyewitnesses and the inability of forensic pathologists to visit the scene of death are the limitations related to these cases.

CONCLUSION

This case series analyses three cases of death due to elephant attack, revealing the following key findings. All three victims were young male villagers residing in the vicinity of the forest and were farmers. Assault by blunt force weapon and run-over road traffic injuries were excluded during autopsy and death scene investigation by the police. All victims had blunt polytrauma, specifically, crush injuries involving large areas of the body, with fractures of underlying bones. This pattern of injuries in these cases, considering the circumstances, is specific to injuries caused by elephant attacks. However, other causative factors for blunt polytrauma need to be ruled out before considering elephant attack. Villagers need to be warned to restrict their movements, and they should be extra careful and vigilant. Further long-term study is recommended to come up with preventive measures. Since most of the cases are always fatal, preventive measures are more vital in minimising casualties.

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None.

CONFLICTS OF INTEREST

The authors declared no conflicts of interest.

ETHICAL ISSUES

The presented cases were conducted for medico-legal purposes, and the findings were used for academic purposes, with the informed written consent of the next of kin, without divulging the identity of the individuals.

SOURCES OF SUPPORT

None.

AUTHOR CONTRIBUTIONS

KBG: Conception of the work; acquisition, analysis, and interpretation of data for the work; reviewing the work critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. **SHJ:** Conception of the work; acquisition, analysis, and interpretation of data for the work; drafting the work and reviewing it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. **MP:** Conception of the work; acquisition, analysis, and interpretation of data for the work; drafting the work and reviewing it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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