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Case Report

Injuries in survivors of elephant attack: Report of three cases

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ABSTRACT

Human-elephant conflict (HEC) in India is becoming a growing health problem causing many fatalities every year. Elephants produce injuries by trampling, stomping, squeezing, tossing in the air, or crushing/targeting the head and chest commonly. The adult elephants are most aggressive in their mating season, leading to maximum incidences of HECs in this period. These attacks are mostly unprovoked, though most HECs are provoked. In this case series, the authors described the injuries sustained by three survivors in a short span of one month due to the sudden and unprovoked elephant attack. All the injuries were mild to moderate in severity and involved the chest in common. Timely rescue and prompt initiation of treatment were pivotal in their survival. The authors also want to create awareness about the mating season of elephants to minimize these unfortunate events in the future.

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Introduction

Animal-related injuries are becoming a growing health problem worldwide, contributing to significant mortality and morbidity.¹ Deforestation, industrialization and expansion of the human population has led to shrinkage and fragmentation of the wild animal habitat, leading to increased human-animal encounters, especially elephants.² Odisha is a state in Eastern India with a tribal-dominated population living in or near the forests, and the incidences of human-elephant conflicts (HECs) are quite common here.³ Herein, the authors describe the injuries sustained by three survivors of elephant attack presenting to a tertiary care hospital in a short span of one month.

Case report

Case 1

An adult elephant attacked a 50-year-old male in his village at about 09:00 in the morning while collecting woods in a nearby bush. The attack was sudden and unprovoked, and he sustained a crush injury to his chest and a lacerating injury to the left scrotum. The nearby people managed to rescue him and transported the patient to a primary health centre. After receiving first aid there, he

was shifted to our hospital at 14:20. On presentation, the patient was conscious but dyspnoeic. He had a heart rate of 110 beats/min, blood pressure of 110/70 mmHg, and a respiratory rate of 24 breaths/min. He could maintain a saturation of 88% in room air, which improved to 93% with oxygenation by face mask. The examination revealed decreased chest movement on the left side with supervening surgical emphysema, dull note on percussion, and reduced air entry on left infra-mammary and infra-axillary areas.

With clinical evidence of left side haemothorax and rib fractures, tube thoracostomy was done, which drained around 160 mL of collected blood. Multiple abrasions over extremities, chest, and abdomen were noted, along with a laceration of 3 cm × 2 cm over the left scrotum. The scrotal wound was thoroughly cleaned and sutured. The abdomen was soft and non-tender with negative focused assessment with sonography for trauma (FAST). Other systemic examination revealed no abnormality. The chest X-ray showed multiple rib fractures on the left side with evidence of haemothorax and surgical emphysema and an old fracture of the 5th rib on the right side (Fig. 1). The injury severity score (ISS) was 11. The patient was admitted and managed with thoracic epidural analgesia, injectable analgesics, antibiotics, and incentive spirometry. He was discharged on the fifth day in a stable condition.

Case 2

Another case of elephant attack occurred in the same district and the same month of the year when a 48-year-old male was

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attacked by an adult elephant from behind while he was walking on the road in the morning hours. He was first pushed by the trunk, and after falling on the ground, he was trampled on his chest. Once again, he was rescued by the nearby people who took him to a nearby district hospital for first aid and then transferred to our hospital. The incident occurred at 11:00, and the patient was brought to our hospital at 14:00.

At presentation, the patient was conscious, and his vital signs were stable with an oxygen saturation of 98% in room air. The examination revealed mild surgical emphysema on the right hemithorax, associated with tenderness and decreased air entry over the bilateral chest. His abdomen was soft and non-tender with negative FAST. Chest X-ray revealed multiple rib fractures on the right side (3rd to 5th ribs and 8th rib) and 5th rib on the left side (Fig. 2). The ISS was calculated to be 11. The patient was managed by inserting bilateral chest tubes and rest along similar lines as the previous patient. He was discharged on the fifth day in a stable condition after the removal of chest tubes.

Case 3

The third attack from the same area occurred during the late evening at about 20:00, and the victim was a 40-year-old male. The elephant attacked him from behind with the tusk throwing him to the ground on his face. He sustained trampling injury over the chest bilaterally, head, face, and right leg. The patient was conscious and alert on presentation with stable vitals though he presented after 5 h of the incident. Surgical emphysema was present on the right hemithorax with associated tenderness and decreased air entry. There were multiple abrasions and lacerations over the back, face, nose, and lower extremities with bilateral nasal bleeding which stopped spontaneously. His central four incisors were uprooted (Fig. 3A), and tenderness was noticed over the right leg. The ISS was calculated to be 14.

Other systemic examinations revealed no abnormalities. Chest X-ray and CT thorax revealed 1st and 2nd rib fractures on the right side (Fig. 3B) with haemothorax and surgical emphysema (Fig. 3C).

The abdomen was soft with negative FAST. X-ray of the right leg showed an undisplaced fracture of the proximal fibula and distal tibia (Fig. 3D).

CT head and spine ruled out any other fracture. The patient was managed with right tube thoracostomy, above knee cast for right leg undisplaced fracture of fibula, and suturing of the right lower lid laceration after thorough cleaning of the wounds. The rest of the

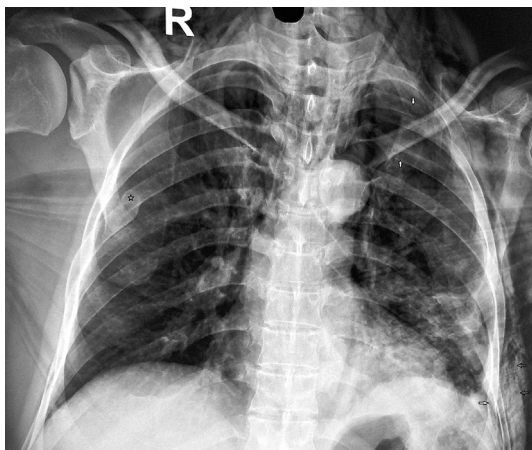


Fig. 1. Chest X-ray showing fractures of ribs marked by solid arrows and surgical emphysema marked by hollow arrows. Asterisk shows an old fracture on the right side.

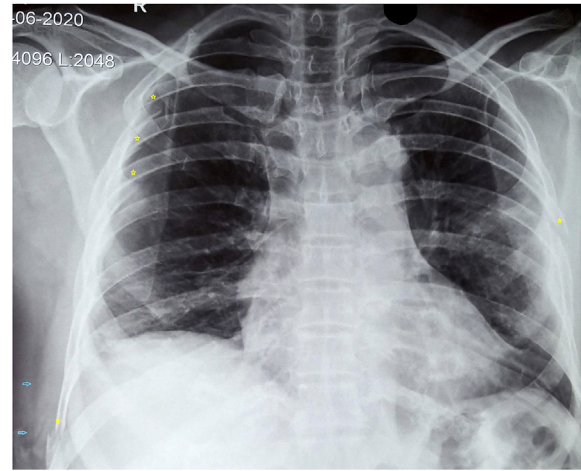


Fig. 2. Chest X-ray showing ribs fracture marked by asterisks and surgical emphysema marked by arrows.

management was the same as in previous cases. The patient was discharged on the fifth day in a stable condition.

Discussion

Elephants are the largest land mammal alive today. They are megaherbivores whose survival depends upon migration to broad areas searching for food, water, and reproductive requirements. Expansion of the human population, deforestation, and urbanization has led to shrinkage of their habitat and proximity to humans resulting in frequent HECs, which are frequently fatal. India alone reports approximately 400 human deaths annually by HECs.³ Odisha is a tribal-dominated state of eastern India with forest area of about one-third of its total land area. Traditionally they live in or near forest areas for their livelihood and are naturally more exposed to HEC.

Injuries due to elephant attack differ from other injuries as a result of the big size of elephants and severity of the impact. Attacks by elephants occur most commonly in farmlands, near homes, or in forests when people intrude on their habitat.^{2,4,5} Severe blunt injuries to the chest or head by trampling, stomping, squeezing, tossing, or crushing injuries are the most reported injury mechanisms, while penetrating injury by tusk is rare.^{2,4} Elephants are intelligent animals. They have a fair idea of location of vital organs in humans, so they primarily target chest and head regions; however, they lack specificity due to their massive size.^{2,4,6} The highest number of deaths reported in India is between April to August, which is the mating season of adult elephants, when they are in the “musth” phase and become most aggressive and violent.² In our series, the incidence occurred in May & June, and all the attacks were sudden and unprovoked. All three cases have sustained blunt injuries to the chest, and one of the cases has associated maxillo-facial injury.

The majority of HECs are fatal as these incidences usually occur in remote areas in the vicinity of forests where there is a substantial delay in notification and rescue. There is a lack of proper health care facilities in remote areas, and crucial time is lost during transportation of the injured patients to the centres able to provide definitive care. Fortunately, in our case series, the severity of injury varied from mild to moderate as the local people rescued all the victims and timely treatment was given. The management should start at the site with the available resources, followed by immediate transport to the nearest trauma centre. On patient's arrival, they are

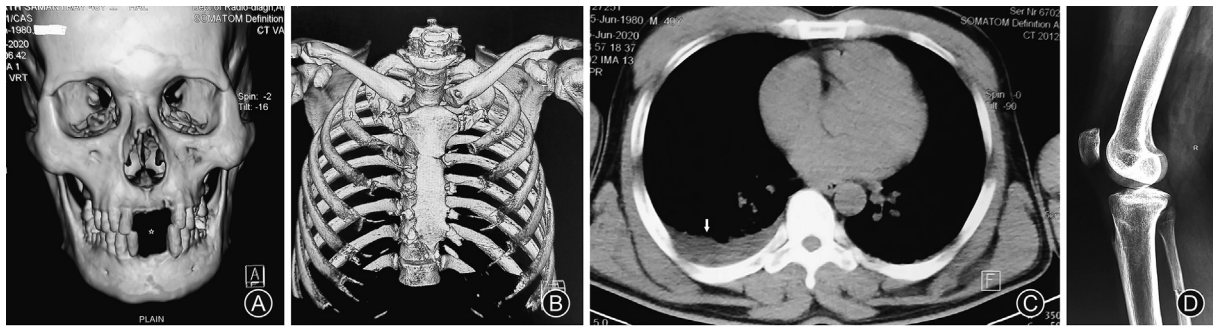


Fig. 3. (A) Non-contrast CT showing uprooted four incisors marked by asterisk; (B) 3D reconstruction of anterior chest wall showing ribs fracture marked by white arrows; (C) CT scan showing right side haemothorax marked by white arrow; (D) X-ray of the right leg showing undisplaced fracture of the fibula.

triaged and emergency resuscitation is started as per the advanced trauma life support protocol. A bedside X-ray chest and FAST is used as adjunct to primary survey in all the cases and CT scan is done if indicated. Chest injury is primarily managed by adequate analgesia and/or intercostal tube drain placement if there are no indications for thoracotomy. These kinds of injuries should always be considered life-threatening and require a well-coordinated multidisciplinary team approach for its management. A psychiatrist should be an integral part of the team as the psychological aspect of trauma is often neglected.

There is no consensus or guidelines regarding the management of these kinds of injuries due to its rarity and incidences confined only to certain parts of the world. Fencing between residential area and adjoining forest, avoiding outdoor activities alone especially in the morning or late at the evening and getting information about suspected movement of elephants in advance by forest officials could be some important measures to avoid HEC.

In conclusion, the HEC continues to be a significant health problem, especially for the people living in areas adjacent to the forest. Prehospital management and time-lapsed in transport to a dedicated trauma centre are the key factors deciding survival chances. Increasing awareness among people about the mating season of elephants, better preparedness, and resource allocation for prompt management can help minimize these unfortunate events in the future.

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Ethics statement

Informed consent has been obtained from each patient.

Declaration of competing interest

The authors declare that they have no competing interest.

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