

# Himalayan Black Bear (*Ursus thibetanus*) Attack: An Autopsy-Based Analysis of Injury Patterns

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## Abstract

Bear attacks are an uncommon but potentially fatal cause of wilderness trauma. We report the autopsy findings of a 75-year-old man who sustained fatal polytrauma following an alleged Himalayan black bear (*Ursus thibetanus*) attack in Uttarakhand, India. The victim suffered extensive craniofacial injuries, including bone-deep scalp lacerations, a depressed temporal bone fracture, dural tear, diffuse subarachnoid hemorrhage, rib fractures, and a humeral shaft fracture. Death was attributed to hemorrhagic shock secondary to severe scalp trauma. This case highlights the characteristic predominance of craniofacial injuries in bear attacks and emphasizes the importance of recognizing associated occult intracranial trauma. A review of the published literature places these findings in the context of contemporary wilderness trauma and forensic practice.

**Categories:** Trauma, Forensic Medicine

**Keywords:** asiatic black bear, autopsy, bear attack, craniofacial injury, himalayan black bear, injury, polytrauma, wilderness trauma

## Introduction

The Asiatic black bear (*Ursus thibetanus*), commonly known as the Himalayan black bear, is widely distributed throughout the Himalayan region of northern India, including Uttarakhand, Himachal Pradesh, Jammu and Kashmir, Sikkim, and Arunachal Pradesh, where it occupies temperate and subtropical forest ecosystems. Increasing human use of forest resources, habitat fragmentation, agricultural expansion, and settlement at the forest interface have intensified human-bear interactions, making human-wildlife conflict an important public health and conservation concern across the Indian Himalayas. Most encounters occur unexpectedly while people are collecting fodder or firewood, grazing livestock, harvesting crops, or traveling through forest regions. Defensive attacks predominate and are characterized by the bear rearing onto its hind limbs and striking with powerful forelimbs equipped with long claws, often followed by biting, producing a combination of penetrating, cutting, crushing, and blunt-force injuries [1-3].

Although relatively uncommon, bear attacks represent one of the most devastating forms of wilderness trauma because they frequently involve complex multisystem injuries requiring coordinated multidisciplinary care. Owing to the biomechanics of the attack and victims' instinctive attempts to protect themselves, the head, face, neck, and upper extremities are disproportionately affected. Characteristic injuries include deep scalp lacerations, craniofacial fractures, ocular trauma, upper-limb fractures, extensive soft-tissue loss, and occasionally fatal intracranial injury. From a forensic perspective, bear-inflicted wounds may exhibit both sharp-force injuries like cut lacerations (mimicking incised wounds) and blunt-force injuries, making careful clinicopathological correlation essential for reconstructing the mechanism of injury and determining the cause of death [3-6].

Despite increasing reports of bear attacks from the Indian Himalayas, detailed descriptions correlating external wound morphology with internal autopsy findings in fatal cases remain scarce. Such reports provide valuable insights into injury biomechanics, fatal mechanisms, and the recognition of characteristic bear-inflicted trauma. We report a fatal case of polytrauma following a Himalayan black bear attack in Uttarakhand, India, highlighting the distinctive pattern of external and internal injuries and reviewing the contemporary literature to emphasize clinically and forensically relevant injury patterns.

## Case Presentation

A 75-year-old man from a rural village in Tehri Garhwal district, Uttarakhand, India, was allegedly attacked by a Himalayan black bear while returning home through a forested area. According to the investigating officer and accompanying hospital records, the victim sustained multiple injuries during the attack and was brought to the All India Institute of Medical Sciences (AIIMS), Rishikesh. He was declared brought dead on arrival, approximately 6 h after the incident. A medicolegal autopsy was performed the following day to determine the cause and manner of death.

External examination revealed multiple injuries involving the head, face, trunk, and upper extremities (Figures 1A-1D). Craniofacial trauma predominated and consisted of two bone-deep scalp wounds over the right parietal and occipital regions measuring 7×1 cm and 7×2.5 cm, respectively. Additional injuries

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included a bone-deep lacerated wound over the right temporal region, a laceration of the right ear, two facial cut lacerations involving the right mandibular and infraorbital regions, and a lacerated wound over the right shoulder. Multiple reddish abrasions and contusions were present over the shoulders, back, left forearm, and left arm. A cut laceration with surrounding contusion was identified over the right upper arm. Marked deformity, swelling, and crepitus of the left arm indicated an underlying fracture of the humeral shaft.

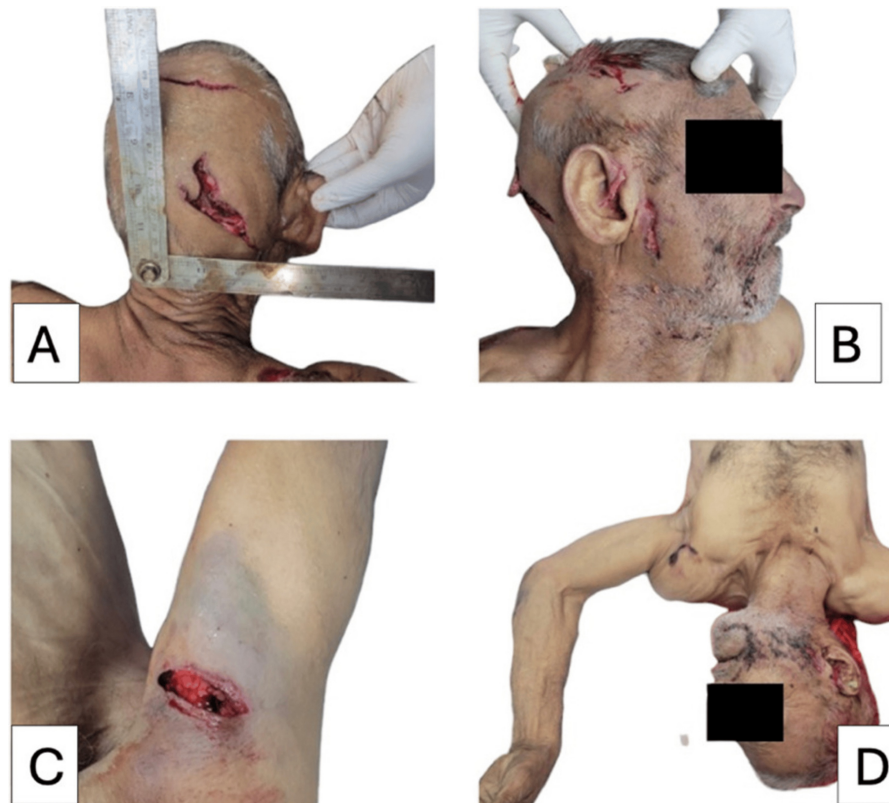


**FIGURE 1: External injuries following the Himalayan black bear attack.**

(A) Posterior scalp showing extensive bone-deep parietal and occipital lacerations. (B) Right temporal and facial wounds with auricular involvement. (C) Right upper arm injuries. (D) Left upper arm injuries.

Reflection of the scalp demonstrated extensive subgaleal hemorrhage. Internal examination of the head revealed contusion and puncture of the right temporalis muscle, a depressed comminuted fracture of the right temporal bone, tearing of the dura mater, and diffuse subarachnoid hemorrhage involving the bilateral frontal, parietal, temporal, and occipital lobes (Figures 2A-2D). Examination of the thorax demonstrated fractures of the right fourth, fifth, and sixth ribs with surrounding hemorrhage. No major injuries were identified within the neck, thoracic viscera, abdominal viscera, pelvis, or spinal column apart from incidental chronic findings, including bilateral renal cysts, hepatic steatosis with a small hepatic hemangioma, and pleural adhesions.

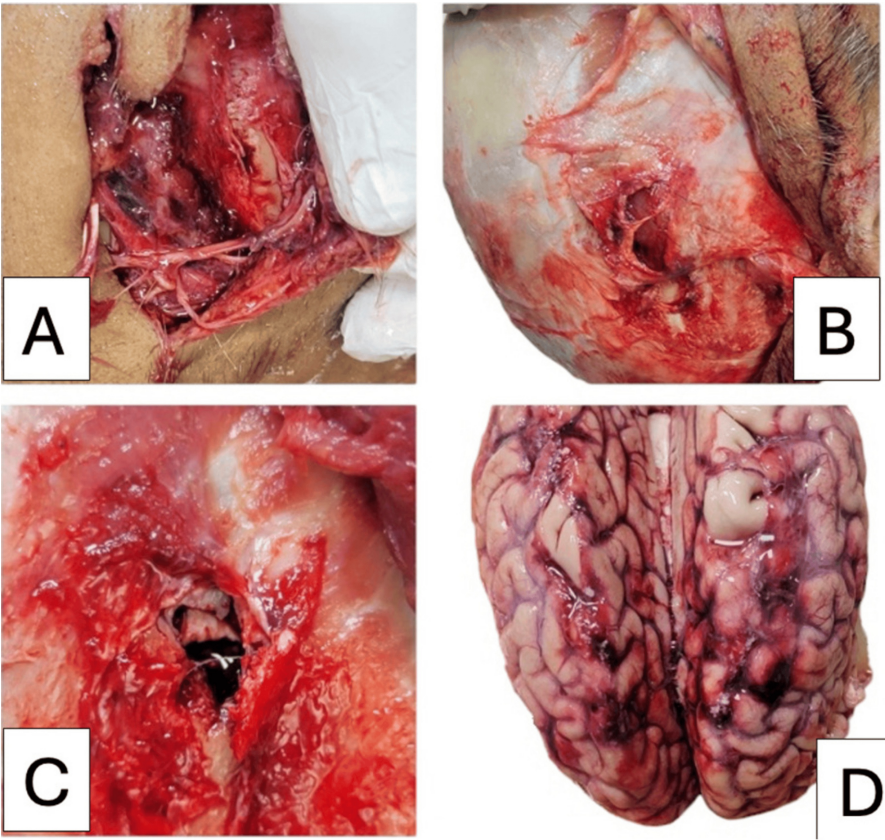


FIGURE 2: Internal cranial injuries.
(A) Extent of scalp injury on reflection. (B) Reflection of the scalp demonstrating extensive subgaleal hemorrhage.
(C) Depressed comminuted fracture of the right temporal bone with associated dural tear. (D) Diffuse subarachnoid hemorrhage involving the cerebral convexities.

Based on autopsy findings, death was certified as resulting from hemorrhagic shock consequent to extensive scalp injury sustained during bear attack. All injuries were determined to be antemortem and of recent origin (Table 1). The large parietal and occipital scalp wounds were individually and collectively considered sufficient to cause death in the ordinary course of nature. The scalp, facial, auricular, and right arm wounds were attributed to sharp and pointed force, whereas the remaining injuries were consistent with blunt-force impact.

| Regions        | Major injuries                                                                                   |
|----------------|--------------------------------------------------------------------------------------------------|
| Scalp          | Two bone-deep parietal and occipital wounds; extensive subgaleal hemorrhage                      |
| Skull          | Depressed comminuted fracture of right temporal bone                                             |
| Brain          | Dural tear; diffuse subarachnoid hemorrhage                                                      |
| Face           | Right ear laceration; mandibular and infraorbital wounds                                         |
| Thorax         | Fractures of right 4th-6th ribs                                                                  |
| Upper limbs    | Left humeral shaft fracture; right arm laceration with contusion; abrasions over left upper limb |
| Trunk          | Right shoulder laceration; abrasions and contusions over shoulders and back                      |
| Cause of death | Hemorrhagic shock secondary to extensive scalp injury                                            |

TABLE 1: Injury complex in the present case.

Discussion

The circumstances of the present case are most consistent with a defensive human-bear encounter.

According to the investigating officer, the victim was returning home through a forested area of Tehri Garhwal during daylight when the attack occurred. Similar circumstances have been described throughout the Indian Himalayas, where encounters typically involve villagers collecting fodder or firewood, grazing livestock, or traveling through forested terrain. Most attacks by the Asiatic black bear (*Ursus thibetanus*) occur following sudden close-range encounters, particularly when the animal is startled or perceives a threat to itself or its cubs, whereas predatory attacks on humans remain distinctly uncommon. Human encroachment into forest habitats, increasing dependence on forest resources, and expanding human-wildlife interfaces have contributed to a substantial burden of human-bear conflict across Himalayan regions [1,3,7].

The injury distribution in the present case permits reconstruction of a probable mechanism of attack. Trauma was concentrated over the right side of the scalp, face, shoulder, and upper limbs, with relatively minor injuries elsewhere. This pattern suggests that the victim was initially struck by the bear while facing it or partially turning toward it. The two long bone-deep scalp wounds extending across the parietal and occipital regions are consistent with forceful sweeping claw strikes delivered from above, whereas the temporal wound with an underlying depressed comminuted fracture, dural tear, and diffuse subarachnoid hemorrhage indicates substantial blunt-force transmission during the same or a subsequent impact. The fracture of the left humeral shaft and injuries involving both shoulders are compatible with instinctive defensive movements in which the upper limbs were used to shield the head. Similar distributions of parallel scalp lacerations, craniofacial fractures, and upper-limb injuries have been documented in fatal autopsy studies and large clinical series of Asiatic black bear attacks [4,8-11]. Although the precise sequence of individual blows cannot be determined retrospectively, the combination of external wound morphology and internal injuries strongly supports repeated forelimb strikes as the principal mechanism responsible for the fatal craniofacial trauma.

Bear attacks represent a distinctive form of wilderness trauma because injuries result from the combined effects of claws, teeth, body weight, and secondary impact with the ground or surrounding objects. Clinical series from Kashmir and Central India consistently demonstrate a predominance of injuries involving the head, face, neck, and upper extremities, reflecting both the attack behavior of the bear and victims' instinctive attempts to protect vital structures [4,9-11]. In the present case, the coexistence of deep scalp wounds, depressed temporal bone fracture, diffuse subarachnoid hemorrhage, rib fractures, and humeral fracture illustrates the multisystem nature of bear-inflicted trauma. Importantly, the relatively limited number of external wounds belied the severity of the underlying intracranial injury, emphasizing that apparently localized scalp trauma should not preclude thorough neurological assessment and cranial imaging in surviving patients.

The morphology of the wounds also has important medicolegal implications. Several scalp and facial injuries exhibited clean, sharply demarcated margins over part of their length before becoming progressively irregular, producing wounds that could resemble injuries caused by sharp-edged weapons. However, correlation with the scene history, associated abrasions and contusions, underlying fractures, and the characteristic anatomical distribution supported their origin from bear claws rather than conventional sharp-force trauma. Fatal autopsy studies have similarly described multiple parallel scalp and facial lacerations associated with extensive subgaleal hemorrhage and cranial fractures as characteristic features of bear attacks [8]. Recognition of this combination of sharp-force-appearing claw wounds and blunt skeletal injury is important for accurate forensic reconstruction, particularly when the history of animal attack is incomplete or unavailable.

Fatal bear attacks most commonly result from severe hemorrhage, catastrophic craniofacial trauma, intracranial injury, or combinations of these mechanisms [8,12]. In the present case, death was certified as hemorrhagic shock consequent to extensive scalp injury. Nevertheless, the associated depressed temporal bone fracture, dural disruption, and diffuse subarachnoid hemorrhage demonstrate that fatal neurotrauma occurred concurrently. The scalp is richly vascularized, and extensive lacerations may produce substantial blood loss, particularly when accompanied by skull fractures and underlying soft-tissue disruption. Accordingly, the fatal mechanism in this patient is best interpreted as severe hemorrhagic craniofacial trauma with associated intracranial injury.

Management of patients surviving bear attacks requires adherence to established trauma principles, including early airway assessment, hemorrhage control, systematic evaluation for occult craniofacial and skeletal injuries, and timely surgical consultation. Published series have documented the need for emergency airway management, vascular repair, repeated wound debridement, fracture stabilization, staged reconstructive procedures, and prolonged rehabilitation following bear mauling [4,10,13]. Because these wounds are frequently contaminated with environmental material and animal oral flora, meticulous irrigation, removal of devitalized tissue, tetanus prophylaxis, consideration of rabies post-exposure prophylaxis according to local public health recommendations, and appropriate antimicrobial therapy are essential components of management [13,14]. Survivors often require long-term reconstructive surgery and psychological rehabilitation because of persistent functional impairment and facial disfigurement [4,10].

This report adds detailed autopsy-pathological correlation to the limited literature describing fatal Himalayan black bear attacks. By integrating the circumstances of the attack, external wound morphology, and internal examination findings, it illustrates the characteristic predominance of craniofacial injuries and the coexistence of claw-associated sharp-force-appearing wounds with severe blunt cranial trauma. These observations provide clinically relevant insights for emergency physicians and trauma surgeons while

assisting forensic pathologists in recognizing the distinctive injury patterns of bear attacks and accurately reconstructing the mechanism of fatal injury.

## Conclusions

Fatal Himalayan black bear attacks can produce complex polytrauma characterized by the coexistence of extensive craniofacial soft-tissue injury, skull fractures, intracranial trauma, and significant hemorrhage. This case highlights the characteristic predominance of head and upper-body injuries and demonstrates that seemingly localized scalp wounds may be associated with life-threatening underlying neurotrauma. Recognition of these injury patterns is essential for timely trauma evaluation, surgical decision-making, and accurate medicolegal assessment. By correlating external wound morphology with autopsy findings, this report adds to the limited literature on fatal bear attacks in the Indian Himalayas and underscores the importance of multidisciplinary management and continued efforts to reduce human-bear conflict in wilderness regions.

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Arwinder Singh

**Acquisition, analysis, or interpretation of data:** Arwinder Singh, Yashpal Sindhu, Vikas Vaibhav, Raviprakash Meshram, Amit Jangid

**Drafting of the manuscript:** Arwinder Singh, Yashpal Sindhu

**Critical review of the manuscript for important intellectual content:** Arwinder Singh, Yashpal Sindhu, Vikas Vaibhav, Raviprakash Meshram, Amit Jangid

**Supervision:** Vikas Vaibhav, Raviprakash Meshram

### Disclosures

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