e-ISSN: 0975-9506, p-ISSN: 2961-6093

Available online on www.ijpqa.com

International Journal of Pharmaceutical Quality Assurance 2025; 16(11); 121-126

Original Research Article

# Pattern of Bear Maul Injuries in a Peripheral Hospital in Jammu and Kashmir

**Sajjid Hussain Batt[1], Saarthak Kaushik[2], Saima Amin[3]**

[1]Consultant Surgery Department of health and family welfare, District hospital Kishtwar, Jammu and Kashmir, India

[2]Post graduate, Department of General Surgery, GMC Jammu, Jammu and Kashmir, India

[3]Senior Resident Department of Anaesthesia and Critical care, GMC Srinagar, Jammu and Kashmir, India

**Received: 25-07-2025 / Revised: 23-08-2025 / Accepted: 26-09-2025**

**Corresponding Author: Dr. Saima Amin**

**Conflict of interest: Nil**

**Abstract:**

**Background**: Bear maul injuries form a significant portion of wildlife-related injuries in forest-adjacent regions of Jammu and Kashmir, often resulting in soft tissue damage, facial disfigurement, and long-term disability and psychosocial damage.

**Objective**: To analyze the demographic profile, injury patterns, radiological findings, and management of bear maul victims presenting at aperipheral hospital in Chenab valley of Jammu and Kashmir.

**Methods**: A combined retrospective and prospective study was conducted on 57 patients admitted at Government District Hospital, Kishtwar, between January 2019 and October 2025. Data were collected on patient demographics, injury site, circumstances of attack, FAST findings, and treatment approaches. Statistical analysis was performed to determine distribution and outcomes.

**Results**: Among 57 evaluated cases, 68.43% were male and 31.57% female; adults constituted 75.43% of victims. USG FAST was positive in 15.78% of cases, indicating intra-abdominal involvement. The face and scalp were the most commonly affected areas (45.61%), followed by upper limbs (28.07%) and lower limbs (15.78%). Most attacks were sudden (63.15%), while provocative and predatory encounters accounted for 24.56% and 12.28%, respectively. Surgical intervention was required in 57.89% of patients, primarily for wound wash, debridement, and fracture fixation, while 42.11% were managed conservatively with dressings and prophylaxis.

**Conclusion**: Bear maul injuries represent a major surgical challenge in hilly regions. Early wound management, infection prevention, ARV administration and coordinated trauma care, coupled with community awareness and wildlife safety measures, are essential to minimize morbidity and improve outcomes.

**Keywords**: Bear Maul, Bear attack, Jammu and Kashmir, Chenab valley.



## Introduction

Human-wildlife interaction is common in forest-adjacent districts, and bear maul injuries constitute a significant share of trauma admissions. These injuries often involve complex soft tissue damage, facial disfigurement, and psychosocial trauma. This study aims to analyze demographic distribution, pattern of injuries, investigation findings, and management outcomes in bear maul victims presenting to a district hospital.

The Chenab valley of Jammu and Kashmir is home to two main bear species: the Himalayan Brown Bear and the Asiatic Black Bear. These bears play a critical role in the local ecosystem but also occasionally cause conflict with human populations due to habitat overlap. The Himalayan Brown Bear (Ursusarctosisabellinus) is the largest mammal found in this region. It primarily inhabits the higher altitudes of the western Himalayas, including subalpine and alpine areas. Recognized by their thick reddish brown or sand coloured fur, these bears are omnivorous and hibernate during winters. Their population in India is quite limited, with an estimate of around 500–700 individuals.

The Asiatic Black Bear (Ursusthibetanuslaniger), also known as the Himalayan Black Bear, is distinguished by a crescent-shaped pale patch on the chest. These bears inhabit temperate broad leaved and coniferous forests as well as alpine meadows in the Himalayas. They are omnivorous and utilize their long claws for climbing and foraging. Bear sightings can lead to human bear conflicts, especially when bears stray near villages, leading to crop

damage or attacks. Local authorities actively monitor and manage such incidents to ensure both human and animal safety. Bears are generally non aggressive when left undisturbed but they do attack humans when they are surprised or provoked with threat to themselves or their young ones or when they are hungry.

During attacks, bears use their forelimbs and claws rather than their jaws. Injuries vary from small abrasion to devastating and fatal injuries. Bear encounters are categorized as sudden, provoked or predatory. In sudden encounters, neither the person nor the bear is aware of each other's presence till they are in close range of each other. Such encounters are usually defensive in nature whereby the bears try to protect their young ones, their food cache or their territory.

Provoked encounters are the second most common type of encounters. Such cases occur with bear hunters and wild life photographers. Hunters who either miss or place an inadequate shot can become a victim of their prey. Predatory attacks are defined as the ones where the bear clearly treats its victim as a food source.

**Figure 1:**

**Objectives**

1. To study the demographic distribution (gender, age group) of bear maul victims.
2. To assess the type and anatomical distribution of injuries.
3. To evaluate the role of USG FAST in identifying intra-abdominal involvement.
4. To analyse the management approach - conservative vs surgical.

**Materials and Methods**

The present study is both a retrospective and prospective study of all the patients of bear maulings who were admitted and treated in Govt. District Hospital, Kishtwar, from January 2019 to October 2025. Study consisted of 57 patients, of whom 51 belonged to retrospective group and 6 were from prospective group. All the details in both the groups were evaluated as per the proforma.

In the retrospective group, the case records were retrieved from the Medical Records of this hospital. In the prospective group, a detailed history was taken from the patients/attendants, laying special emphasis on location of bear–human encounter (habitat of bear), circumstances which led to the encounter, single bear or sow with cubs, nature and duration of attack. Any deterrent measures used during the incident before reaching our hospital, were all noted down. On arrival in the casualty section of our department, a record of the vital signs was made. The patients were adequately evaluated for the presence of any head, chest, abdominal or skeletal injuries. A thorough clinical examination from head to toe was made to evaluate the site and type of injury inflicted. Details of wounds were recorded.

Any bony fractures were noted down. Any soft tissue or bony loss was also recorded. Routine investigations including radiographs and USG FAST were done in all cases besides special investigations such as computed tomography (CT) wherever indicated. Any fatalities among the injured were recorded and finally statistical analysis of all collected data was made.

Fluid resuscitation was done thoroughly wherever indicated. Anti-rabies vaccinations were started according to the WHO regimen. We followed five dose intramuscular regimens, that is, one dose of vaccine administered on days 0, 3, 7, 14 and 28 in the deltoid region (or in antero-lateral thigh muscles small children). Anti-rabies immunoglobulin was given in the dose of 40 IU/kg body weight of which half was given locally at the site of the wound, and half was given intramuscularly. A single shot of tetanus toxoid was given in accordance with the immune status of the patient. IV antibiotics were given empirically to all patients in ER and continued post-procedure according to wound swab culture reports. Wounds were thoroughly washed with normal saline and surgical debridement was done in operating theater. Minor lacerations were closed primarily and complex wounds with gross contami-

nations were managed primarily with wound washes and debridement and patients with wounds with severe disfigurement and tissue loss were referred to higher centers for furthered management. Patients were followed in out-patient basis once discharged from hospital.

**Inclusion and Exclusion Criteria**

**Inclusion Criteria:** All age groups presenting with direct bear attack injuries.

**Exclusion Criteria:** Old healed scars or non-bear-related injuries.

**Results**

Among a sample of 57 bear maul victims, 68.43% (39 patients) were male and 31.57% (18 patients) were female, reflecting a similar male predominance due to higher risk of exposure. Adults comprised 75.43% (43 patients) of the cases, while paediatric patients accounted for 24.57% (14 patients). USG FAST results were positive in 15.78% (9 patients), indicating intra-abdominal injuries mainly in severe cases, with the majority (84.22%, 48 patients) testing negative. The anatomical distribution of injuries showed the face and scalp were the most common sites involved, with 45.61% (26 patients), followed by the upper limbs at 28.07% (16 patients), lower limbs at 15.78% (9 patients), and back and trunk accounting for 7.01% (4 patients). Injuries affecting multiple sites were seen in 3.5% (2 patients). Management included surgical intervention in 57.89% (33 patients), primarily for wound debridement, primary closure and fracture fixation, while 42.11% (24 patients) were managed conservatively with antibiotics, antirabies, tetanus prophylaxis, and dressing. Regarding the nature of the attacks, most were sudden (63.51%, 36 patients), occurring unexpectedly without provocation. Provocative attacks, triggered by threats or defense, constituted 24.56% (14 patients), while predatory attacks, which are rare and involve stalking or hunting behavior, accounted for 12.28% (7 patients). This data highlights the critical need for surgical readiness, community awareness, and preventive safety strategies in district hospitals managing bear maul injuries.

Among the 57 bear maul cases, surgical treatment primarily consisted of wound washes with debridement, which was performed in 20 patients, representing 35.08% of cases. Primary closure of wounds was carried out in 8 patients, accounting for 14.03%. Primary reduction and fixation of fractures were undertaken in 5 patients, constituting 8.77%. Among these surgical candidates, after wound washing and primary closure, 12 patients (21.05%) were referred to higher centers for further management due to complex injuries or intra-abdominal involvement. The remaining patients (42.11%) received conservative management with dressings, antibiotics, and prophylaxis. This distribution indicates that wound debridement and wound washing were the most common surgical interventions, highlighting the importance of initial thorough cleaning in trauma management.

**Table 1: Sex distribution of patients**

| Sex | Number of Patients | Percentage (%) |
|---|---|---|
| Male | 39 | 68.43 |
| Female | 18 | 31.57 |

**Table 2: Age distribution of patients**

| Age Group | Number of Patients | Percentage (%) |
|---|---|---|
| ≤12 years | 14 | 24.57 |
| >12 years | 43 | 75.43 |

**Table 3: USG FAST Findings**

| USG FAST | Number of Patient | Percentage (%) |
|---|---|---|
| Positive | 9 | 15.78 |
| Negative | 48 | 84.22 |

**Table 4: Distribution of site of Injury of patients**

| Site | Number of Patients | Percentage (%) |
|---|---|---|
| Face and Scalp | 26 | 45.61 |
| Upper Limb | 16 | 28.07 |
| Lower Limb | 9 | 15.78 |
| Back and Trunk | 4 | 7.01 |
| Multiple Sites | 2 | 3.50 |

**Table 5: Table showing nature of attack**

| Attack Type | Number of Patients | Percentage (%) |
|---|---|---|
| Sudden | 36 | 63.15 |
| Provocative | 14 | 24.56 |
| Predatory | 7 | 12.28 |

**Table 6: Management of bear maul injuries**

| Management Type | Number of Patients | Percentage (%) |
|---|---|---|
| Surgical | 33 | 57.89 |
| - Wound Wash & Debridement | 20 | 35.08 |
| - Primary Closure | 8 | 14.03 |
| - Reduction/Fracture Fixation | 5 | 8.77 |
| Conservative | 24 | 42.11 |
| Referred to Higher Centre | 9 | 15.78 |

**Figure 2: Bear maul injury with partial avulsion of ear**

**Figure 3: Bear maul injury involving left arm**

**Figure 4: sever e facial avulsion injuries in a case of bear maul patient**

**Figure 5: bear maul injuries involving scalp and face**

## Conclusion

Bear maul injuries remain a significant cause of surgical morbidity in the hilly regions of Jammu and Kashmir. The predominance of head, face, and upper limb involvement reflects the defensive posture during attacks. Prompt wound washing, debridement, and prophylaxis play a decisive role in preventing infection and rabies.

Community education, wildlife management, and interagency coordination are crucial to mitigation and rapid trauma care delivery.

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