Traumatic Brain Injury Due To Bear Maul: A Case Report

Prabhat Jha[1], Nilam Kumar Khadka[1]

[1]Surkhet Provincial Hospital, Karnali, Nepal

Date of Submission: 24th June 2024 Date of Acceptance:15th January 2025 Date of Publication: 15th March 2025

Abstract

NINTRODUCTION:Interaction between bears and human is a common occurrence in hilly region of Nepal. Interactions usually occur where humans live close to the bears' habitat. In hilly regions of Nepal, it can occur when humans go to the jungle for cattle grazing or collecting fodder. The injuries most commonly occur in facial region. Traumatic brain injury due to bear maul can also occur.

CASE REPORT: This case report describes a 19 year female who sustained traumatic brain injury due to bear maul.

DISCUSSION:Management of traumatic brain injury due to bear maul is usually straight forward with goals directed towards aggressive lavage, debridement and infection control. Rabies and tetanus prophylaxis should be given to all patients along with anti tetanus and anti rabies immunoglobulin.

Keywords : Traumatic brain injury, bear maul

Introduction

Interaction between bears and human is a common occurrence in hilly region of Nepal. Interactions usually occur where humans live close to the bears' habitat. In hilly regions of Nepal, it can occur when humans go to the jungle for cattle grazing or collecting fodder. Injuries due to bear mauling are most commonly seen in rural areas, but in developing countries like ours, stripping the wildlife of their natural habitation brings them close to more populated areas in the search of food.[1] Three species of bears, the Asiatic black bear (Ursus thibetanus), the Tibetan brown bear (Ursus arctos pruinosus), and the Sloth bear (Melursus ursinus) are found in Nepal. Brown bears occur at the high mountain region, black bears in the middle mountains, and Sloth bears in the Terai and foothills of Churia in southern parts of Nepal.[2] Among these cases, injuries caused by bear mauling have a much higher incidence of 51.2%, although bear mauling injuries are rarely reported.[3] Most common sites which are involved in mauling by bear is face (80.57%) followed by head (54.67%).[4] Following a facial bite wound, unforeseeable infections (13%-30%) that can occur as a result of primary bacterial invasion and management of extensive soft tissue defect represent the main challenge in the management of such injuries.[5] .

Neurosurgeons working in the vicinity of tribal areas face traumatic brain injury (TBI) cases due to bear maul. [6-8] Most of the literature is focused on the management of maxillofacial injuries. This case report describes the management and outcomes of TBI due to bear maul.

CASE REPORT

A 19 year old female presented to the emergency department of Province Hospital, Surkhet at 4 pm in evening with history of attack by mountain bear while she was fetching fodder for cattles in Accham district. She along with her younger sister were attacked. Her younger sister sustained only minor scalp injury which was sutured primarily after lavage. At presentation in ER the patient's vitals were blood pressure 90/60 mmHg, pulse rate 102/min, temperature 98 degree Farenheit, respiratory rate 20/min, saturation was 94 % at room air. Airway was clear, breathing spontaneous. On initial exposure the patient had sustained injury over head, back, right inguinal region, thigh, popliteal fossa. Tetanus and rabies prophylaxis were given in ER.

Patient was immediately transferred to operation theatre. Patient was placed in supine position. General anaesthesia was given. On exposure of the wound avulsion of scalp was seen with comminuted fracture of skull bone at temporal and frontal region. [Figure 1, Figure 2, Figure 3]

Access this article online

Website: https://www.nepjol.info/index.php/NJN

DOI: https://10.3126/njn.v21i4.67260

HOW TO CITE
Jha P, Khadka NK. Traumatic Brain Injury due to Bear maul: A Case report . NJNS. 2024;24(4):50-52

Address for correspondence:
Prabhat Jha
Surkhet Provincial Hospital, Karnali, Nepal
Email:prabhatkaushaljha@gmail.com

ISSN: 1813-1948 (Print), 1813-1956 (Online)

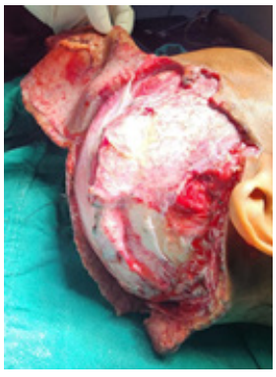

Figure 1 Scalp laceration with exposed temporal bone with comminuted fracture and exposed temporal lobe

Figure 2 Scalp laceration with exposed frontal bone and frontal lobe

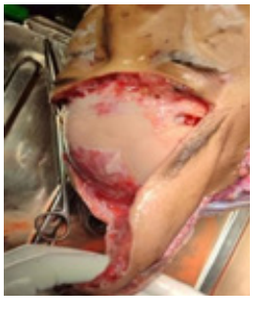

Figure 3 Scalp laceration with exposed frontal bone with frontal bone fracture

Scalp was grossly contaminated with mud, hair, leaves. Active bleeding was present from the scalp flap. Active bleeding was controlled with suturing and bipolar cautery. Thorough lavage of the wound was done with warm normal saline, hydrogen peroxide. All the hair, fodder particles were removed. Thorough debridement of right temporal bone (squamous) and right frontal bone was done.

Two units packed blood cell was transfused during the procedure. Antibiotic prophylaxis was given for gram positive, gram negative and anaerobic bacteria. Wound swab and tissue were sent for culture and sensitivity test. The scalp flaps were primarily approximated over a drain. Human rabies immunoglobulin (20 IU/kg body weight) locally infiltrated in wound before closure. [Figure 4]

Figure 4 Scalp after debridement and suturing

DISCUSSION

Bear maul is an uncommon cause of traumatic brain injury. Injuries due to bear maul are more common in regions where people live in close proximity to the animal or in areas where stripping of natural habitation brings the animal close to human settlement.[5] Tourism may be another cause for these type of injuries.[1-3]

In country like Nepal people in the hilly region go to forest for cattle grazing, collecting fodder for cattles, collecting firewood. Our patient had also gone to the jungle for collecting fodder.

Injuries due to bear mauling are combination of cutting, penetrating, and crushing (due to powerful slaps) type of injuries.[8-9] Our patient also had combination of these injuries with scalp avulsion and penetrating injuries by bear claw over frontal and temporal region.

The injured tissues are grossly contaminated with mud, grass and other foreign materials.[10-11] Our patient also had grossly contaminated wound with hair, mud, leaves present over the wound.

Due to gross contamination with oral microflora, these wounds have poly microflora, most commonly Pasteurella.[11-12]

In a report published by Kunimoto et al. aerobic gram negative bacilli and enterococcus along with anaerobes was present in bear maul injuries.[11] Therefore, it is always better to administer broad spectrum antibiotics. Other factors that must be considered in the management of such injuries are bite location, time until wound management, type of wound, host factors, and local wound care.[9-11]

Tissue culture and wound swab culture was negative in our patient but the hospital doesn't have facilities for anaerobic culture. Empiric antibiotics for coverage of gram positive, gram negative and anaerobes were used. Tetanus and anti rabies prophylaxis were given. Vigorous wound washing and debridement was done along with infiltration of anti tetanus immunoglobulin and anti rabies immunoglobulin.[11-12]

Other factors that must be considered in the management of such injuries are bite location, time until wound management, type of wound, host factors, and local wound care.[10-12]

Wound sustained by the subject involved the head and neck region and this is in accordance with previously documented reports. Borde et al. analyzed twenty-eight patients

with traumatic brain injury due to bear maul.[13] Skull fractures were found in 24/28 (85.71%). Frontal and temporal bone fracture was seen in our case.

References

1. Wolff KD. Management of animal bite injuries of the face: experience with 94 patients. J Oral Maxillofac Surg. 56(7):838-843.
2. Praveen Borde 1, Sanjeev Kumar 1, Debabrata Sahana 1, Lavlesh Rathore 1, Amit Jain 1, Manish Tawari 1, Rajiv Sahu 1 Management Challenges and Outcomes of Traumatic Brain Injury due to Bear Maul in Tribal Areas of Chhattisgarh, India-Man versus Wild J Neurosci Rural Pract 2021 Jul;12(3):504-511. doi: 10.1055/s-0041-1727580. Epub 2021 Jun 10.
3. Devadiga A, Prasad KSV. Epidemiology of maxillofacial fractures and concomitant injuries in a craniofacial unit: a retrospective study. Int Jour Epidemiol. 2007;5(2). https://print.ispub.com/api/0/ispub-article/6174. Accessed October 10, 2019.
4. Nabi DG, Tak SR, Kangoo KA, Halwai MA. Increasing incidence of injuries and fatalities inflicted by wild animals in Kashmir. Injury. 2009;40:87-89.
5. Stefanopoulos PK. Management of facial bite wounds. Oral Maxillofac Surg Clin N Am. 21(2):247-257.
6. Kesting MR, Holzle F, Pox C, Thurmuller P, Wolff KD. Animal bite injuries to the head: 132 cases. Br J Oral Maxillofac Surg. 2006;44(3):235-239.
7. Singh AK, Dulal S, Mayya NJ. A rare case of bear attack on the face and the treatment in college of medical sciences, Bharatpur, Central Nepal. J Coll Med Sci-Nepal. 2015;11(2):31-33.
8. Ram R. Maxillofacial injuries due to bear mauling. J Maxillofac Oral Surg. Jan-Mar 2011;10(1):85-89.
9. Middaugh JP. Human injury from bear attacks in Alaska, 1900-1985. Alaska Med. 29(4):121-126.
10. Kar IB, Chopda PD, Mishra N, Sethi AK, Mahavoi BR. Management of maxillofacial injuries in bear mauling cases: a review of 20 cases. J Korean Assoc Oral Maxillofac Surg. 2016;42:13-19.
11. Dennis Kunimoto, Robert Rennie, Diane M. Citron, Ellie J. C. Goldstein Bacteriology of a Bear Bite Wound to a Human: Case ReportDOI: https://doi.org/10.1128/jcm.42.7.3374-3376.2004Volume 42, Number 7July 2004
12. Kunimoto D, Rennie R, Citron DM, Goldstein EJC. Bacteriology of a bear bite wound to a human: case report. J Clin Microbiol. 42(7):3374-3376.
13. Borde P, Kumar S, Sahana D, Rathore L, Jain A, Tawari M, Sahu R. Management Challenges and Outcomes of Traumatic Brain Injury due to Bear Maul in Tribal Areas of Chhattisgarh, India-Man versus Wild. J Neurosci Rural Pract. 2021 Jul;12(3):504-511. doi: 10.1055/s-0041-1727580. Epub 2021 Jun 10. PMID: 34295104; PMCID: PMC8289496.