

## A Study on Bear Mauling In Tertiary Care Unit of Central India

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**Abstract:** Due to increased number of bear mauling in central India, we studied the various factors in bear mauling and outcome of management in GMCH from 2014 to 2017. A total of 26 cases evaluated which were predominantly male. It is obvious that involvement of head, neck face and upper limb was in maximum cases. The age wise study shows that there was equal involvement of people from young, middle aged and older ones. It was a retrospective analysis of the reported cases. Most victims suffered from multiple injuries. We observed that in 85% of cases of mutilation overhead neck and face, it was most common site of bear mauling. Probably, it is because usually the attacks by bear are mainly on standing posture with hind limbs. All the patients were treated by a team led by surgeons including dental cum oral surgeon, otorhinolaryngologist, ophthalmologist and orthopedician. Surgical repair was done under all aseptic precaution and analgesia. The injury may cause sufficient disfigurement and require extensive reconstruction. But multidisciplinary approach with proper general surgical care can save the patient with reduction in mortality and morbidity.

**Keyword:** Bear Mauling, GMC Nagpur

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### I. Introduction

India which is one of the largest economies in the world, timber and non-timber forest products contributes significantly to it. Invasion of man in forest in search of bread and butter leads to interaction with wild animals. Many cases of wild animal conflict with injuries are reported at tertiary care centre of government medical college, Nagpur. We specifically looked into the cases of bear mauling which makes major share of wild animal conflict with man leading to hospitalisation in this region.

The Sloth bear (*Melursus ursinus* Shaw, 1791, Carnivora: Ursidae: Ursinae), is one of four bear species found in India. It is omnivorous, feeding on social insects such as termites and ants, as well as on fruits such as *Ziziphus mauritiana*, *Ficus benghalensis*, and *Aegle marmelos*. The sloth bear is endemic to the Indian subcontinent, having geographical distribution across India, Nepal and Sri Lanka. The species has been extirpated from Bangladesh and is reported to be rare in Bhutan. The sloth bear's range in India extends from the foothills of the Himalayas to the southern tip of the Western Ghats; however, its distribution is non-continuous and fragmented. The central Indian highlands, Western Ghats and the Eastern Ghats are considered to be strongholds of the sloth bear; central India harbours the largest intact habitat and population of bears. Collection of Non-Timber Forest Produce (NTFP) is one of the common income generation activities in this region, with established markets for a number of products such as tendu leaves (*Diospyros melanoxylon*), mahua flowers and seeds (*Madhuca indica*), sal seeds (*Shorea robusta*) and bamboo (*Dendrocalamus strictus*). Collection of NTFP requires the person to venture several kilometres into the forests, thereby increasing the chance of encounters with sloth bears. Other activities such as cattle grazing and fuel wood collection also increase the risk of sloth bear encounters. Some times in search of water or food sloth bear may enter farms or residential area surrounding forest.

The Sloth bear (*Melursus ursinus*), it is a savage animal, sometimes attacking without provocation and inflicting horrible wounds. Attacking generally the head and face with their claws, while using their teeth also on a poor victim. The sloth bear is the only bear having myrmecophagous adaptations, including the absence of the first maxillary incisors, protrusible mobile lips and raised elongated palate, nearly naked mobile snout, slightly curved front claws, long shaggy coat and nostrils which can be closed voluntarily. These all feature makes sloth bear a dangerous animal to encounter with. Bear bite wounds are often underestimated and untreated. Villagers and tribal are terribly mutilated, some having the scalp avulsion from the head at a time even skull bones along the scalp and many innocent have been succumbed to this. Bear bite injuries to the head and neck region not only result in facial disfigurement but also distressing physical and psychological consequences. The present study has been conducted to know about the role of general surgeon in management of these patients in tertiary care unit.

## II. Material And Methodology

We studied various injury patterns in bear mauling and its outcome after management. Data collection was done after taking proper history during admission, recording examination findings of the patients and following the course of patients in hospital. A total of 26 cases were evaluated. Demographic parameter like age, sex etc were calculated from data. We also did retrospective analysis of the reported cases and various other factors like mode of attacks, circumstances at the time of incidence, patient's further course while making his way to tertiary care unit etc has been recorded.

Most of the cases were referred from periphery, so as per our protocol, all patients were immediately admitted in Emergency Department of our institute. Patients were evaluated immediately from head to toe and primary management started after resuscitating the patients. After stabilising the patient and assessing the amount of injury; patient were subjected for necessary radiological and blood investigation. All the critical patients were immediately shifted to ICU for further care.

Irrespective of severity of injury all the patients were started with Anti rabies vaccination as prescribed by WHO i.e. five dose intramuscular regimen administered on day 0, 3,7,14 and 28 in deltoid region. Tetanus toxoid as well as Antibiotics was also given to provide cover from infection.

Almost all patients have some kind of injury to various body parts like scalp avulsion, multiple contaminated lacerated wound over extremity or head, neck and face region all requiring primary care from surgeon. With proper cover of Antibiotics, every wound was subjected to proper irrigation and cleaning using normal saline and betadine, if needed debridement done. Wherever feasible appropriate suturing for all skin laceration was done. After primary management of wound, patients were admitted and help of other speciality like ENT, OPHTHALM, and OMFS and ORTHO was taken as and when required. In case of skin loss over extremities or severe disfigurement of face help of plastic surgeon take after stabilization of patient.

## III. Results And Discussion

Although bear attacks constitute only 0.1% of all animal attacks in India, their prevalence is quite alarming in the Central India region. 38% of all animal attacks referred to us were bear mauling. India has four species of bears: Asiatic Black bear, Sloth bear, Sun bear and Himalayan Brown Bear. Nagpur which is surrounded by large number of forests is a habitat for Indian sloth bears (*Melursus ursus ursinus*). The sloth bears are medium-sized bears, with an average weight of 130 kg, 2-3 ft high at the shoulder and a body length of 4.6-6.3 ft. They are primarily nocturnal in nature and hunt for the food during the night. Their ideal habitat is a forested area with rocky outcrops. They mainly eat fruits, tubers and insects with special liking for Mahua flowers. Sloth bears probably view humans as potential predators, as their reactions to them (roaring, followed by retreat or charging) are similar to those evoked by the presence of tigers and leopards. The female sloth bear is most dangerous when she has babies with her and can attack immediately without provocation.

In our study greater prevalence of injuries to middle-aged population has been found which can be explained by their working outdoors majority of the time. Outdoor activity was also found to have a relationship with attacks of the bear due to more exposure where hunters, hikers and campers were also the victims. Our finding that men were victims more than women i.e. 93 % ( 24 out of 26); it parallels other studies; this too can again be explained by outdoor activity of men as compared to women. Most victims came from rural areas which is similar to the epidemiological study of animal bites in India.

**Table 1 - Age distribution**

Age distribution	Total & Percent(n=26)
0-10	0
11-20	1
21-30	6
31-40	10
41-50	7
51-60	2
>60	0

**Table 2 – male to female distribution**

Male	Female
24	2

In total 24 patients showed involvement of either face or scalp or both. Most case reports in the literature have similar findings. Sloth bears deal with perceived threats by behaving aggressively; their long claws make them less capable of climbing trees to escape perceived danger. As the face and scalp are easily accessible parts of the body (for bears), they are commonly injured. Visceral injuries from bear mauling in the form of injury to the brain, eyeballs, salivary glands, abdominal organs have been reported. Over 80% of

patients had deep lacerations while punctured wounds were not seen. Roka *et al.* reported a case of penetrating head injury with bilateral eye avulsion

**Table 3-** Body region involved

Sr.no	Region	Percentage(n=26)
1	SCALP	92.33%(24)
2	FACE	84.6%(22)
3	NECK	23.07%(6)
4	SHOULDER	38.46%(10)
5	THORAX( FRONT AND BACK)	8%(2)
6	UPPER EXTREMITY	58%(15)
7	ABDOMEN(FRONT AND BACK)	0
8	LOWER EXTREMITY	19%(5)

**Table 4.** Interval for patients to reach tertiary care unit

Time interval for hospitalisation of patient to tertiary care unit	Less than 24 hours	More than 24 hours
N=26	5	19



Scalp with eye globe



Anterior chest wall



upper limb

*VARIOUS INJURY PATTERN*



DAY 1 AFTER REPAIR



DAY 15 AFTER REPAIR

Guo, Shuzhong, et al expressed aside from the large lacerations and wounds that can result from bear attacks, infections are also physically detrimental. A bear's mouth is full of potentially harmful bacteria, especially if the bear has been feeding on a gut pile or feces. Bear bites can result in gangrene due to profound infection. Recovery from bear attacks depends on the extent of damage, but often involves long-term medical treatment. As shown in the medical procedure led by Professor Shuzhong Guo, extreme cases of bear attacks have resulted in plastic surgeries and even facial transplants that, while successful, may take several years to complete. Geeta NT et al. (2014) opined that the excellent blood supply of the face makes infection a rare occurrence under the proper coverage of antibiotics and analgesics, however, the injury may cause sufficient disfigurement to require extensive reconstruction. Treatment of bear bite wounds addresses both the management of soft tissue deformities and then prevention of post treatment infection. Although generally considered to be dirty or contaminated they could be successfully treated by surgical cleansing and primary suture with a favourable outcome. Bear mauling might leave some secondary defects and multidisciplinary approach with multiple secondary surgeries needed in many cases. The excellent blood supply of the face makes infection a rare occurrence with good antibiotic coverage. However, the injury may cause sufficient disfigurement and require extensive reconstruction. We also observed eye globe rupture in some cases in which enucleation was inevitable. The bony injuries also have to be managed by orthopedician. We conclude that multidisciplinary approach and follow up reduced the rate of infection and morbidity and mortality.

We observed that all but five patients were referred after 24 hour of attack. As all the surrounding forests are situated more than 100 km, from our hospital, patients were initially seen at primary health centres which are situated near the forest before being referred to our hospital. This delay in referral also is one of cause for increased morbidity of the patients.

All patients with major injuries have long stay (average 15 days) which involve various operative procedures and post-op hospital stay. All patients were discharged without any documented mortality.

#### **IV. Conclusion**

We conclude that Bear mauling is major contributory factor in hospitalisation due to animal attack over human in central India region, especially due to wild animal attack. Although multidisciplinary approach are needed all patient need initial management of this patient are done by general surgeons and play key role in this. Mortality from Bear mauling are rare but morbidity due mutilation is very much which also adds in mental trauma to patient, but with proper management both physical and mental trauma can be dealt and patient can again get back to society as a whole again.

#### **References**

- [1]. Sudarshan MK, Mahendra BJ, Madhusudana SN, Ashwoath Narayana DH, Rahman A, Rao NS, et al. An epidemiological study of animal bites in India: Results of a WHO sponsored national multi-centric rabies survey. *J Commun Dis.* 2006;38:32–9. [PubMed]
- [2]. Kale S, Patil S, Khare N, Jain A. Animal bites-should primary reconstruction be the standard treatment? *Euro J Plast Surgery.* 2011;34:367–73.
- [3]. Wikipedia: Sloth bear. [last accessed on 18/12/2014 at 19:38 hrs]. Available from: [http://www.en.wikipedia.org/Sloth\\_bear](http://www.en.wikipedia.org/Sloth_bear).
- [4]. Wikipedia: Bear attack. [last accessed on 18/12/2014 at 19:40 hrs]. Available from: [http://www.en.wikipedia.org/wiki/Bear\\_attack](http://www.en.wikipedia.org/wiki/Bear_attack).
- [5]. Shah AA, Mir BA, Ahmad I, Latoo S, Ali A, Shah BA. Pattern of bear maul maxillofacial injuries in Kashmir. *Natl J Maxillofac Surg.* 2010;1:96–101. [PMC free article] [PubMed]
- [6]. Frank RC, Mahabir RC, Magi E, Lindsay RL, de Haas W. Bear maulings treated in Calgary, Alberta: Their management and sequelae. *Can J Plast Surg.* 2006;14:158–62. [PMC free article] [PubMed]
- [7]. Herrero S. Human injury inflicted by grizzly bears. *Science.* 1970;170:593–8. [PubMed]
- [8]. Venkataswamy G, Rajagopalan AV. A case of injury of right eye by a bear. *J All India Ophthalmol Soc.* 1962;10:22–3. [PubMed]
- [9]. Prasad SC, Thada ND, Rao P, Thada SR, Prasad KC. Grievous temporal and occipital injury caused by a bear attack. *Case Rep Otolaryngol* 2013. 2013 957251. [PMC free article] [PubMed]
- [10]. Jethani J, Nagori R, Ghodadara B. An unusual case of bear bite with severe loss of tissue. *Indian J Ophthalmol.* 2006;54:287–8. [PubMed]
- [11]. Ram R. Maxillofacial Injuries due to Bear Mauling. *J Maxillofac Oral Surg.* 2011;10:85–9. [PMC free article] [PubMed]
- [12]. Roka YB, Roka N, Shrestha M, Puri PR, Adhikari HB. Penetrating head injury with bilateral eye avulsion due to Himalayan bear bite. *Emerg Med Australas.* 2012;24:677–9. [PubMed]
- [13]. 13.Guo, Shuzhong, et al. "Human facial allotransplantation: a 2-year follow-up study" *The Lancet* Volume 372, No-9639, Pg. 631-638

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