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A prospective study of bear mauling injuries: management and complications

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Abstract

Introduction: Reports of human encounters with bear, leopards and other wild species are a regular feature in the Uttarakhand state, as it is home to several wildlife reserves. Habitat degradation, increase in wild animal population and expansion of human population are the main reasons behind the man-animal conflicts.

Those residing in the vicinity of the forests and reserves bear the brunt of such conflicts. Sometimes the injuries are severe and leave behind permanent disabilities.

Objectives: The purpose of this study is to evaluate bear mauling injuries their, management and complications.

Methods: Twenty five patients of bear mauling injuries were managed in a tertiary care centre. After surgical debridement and thorough irrigation of wounds primary repair of soft tissue was done. Bony defect were managed by open reduction and internal fixation. Soft tissue defects was managed by skin grafts and regional flaps. Patients were kept in the hospital for 1-3 weeks.

Results: Patients were treated for wounds ranging from lacerations, puncture wounds to tendon injury, facial fractures and soft tissue loss. Majority of patients were male with age ranging from 25-40 yrs. Twenty patients had facial fractures and five patients had soft tissue loss and. All patients had satisfactory outcome

Conclusion: Bear mauling injuries are complex injuries requiring prompt management. Scalp and face are the most common sites of injuries with underlying facial fractures. Primary soft tissue repair yields good results. Some injuries are complex requiring multistage surgery.

Keywords: bear mauling injuries

Introduction

Reports of human encounters with bear, leopards and other wild species are a regular feature in the Uttarakhand state, as it is home to several wildlife reserves. Habitat degradation, increase in wild animal population and expansion of human population are the main reasons behind the man-animal conflicts.[1]

Those residing in the vicinity of the forests and reserves bear the brunt of such conflicts.

Usually dog bites are most common form of injuries [2]. Human wild animal conflict injuries are rare but with high morbidity.[3] Bear maul injuries are most common wild animal injuries reported.[4] Himalayan region is natural habitat of Asiatic Black Bear (Ursus thiabetanus) . It is a strong agile animal ,attacks with paws, claws and teeth causing tearing, crushing and penetrating injuries.[5] It attacks with fore legs while standing on hindlimbs and being a tall animal, scalp and face suffers the brunt of attack.[6,7,8]

Materials and methods

Twenty five patients of bear mauling injuries presented to Government Medical College, Haldwani, during the period from March 2013 to January 2018 were included in this study. There were seventeen males and eight females in the study.

All patients presented from 8 to 12 hours after injury as there is distance of 100-200km from forest area. Patient's assessment was done and airway, breathing and circulation were secured. Prophylaxis for rabies and tetanus prophylaxis was done in all patients. After thorough debridement and cleaning of wound, primary repair of soft tissue was done .Once patient stabilized definitive management was made for patients with soft tissue loss and facial fractures.(Fig. 1) Patients were followed up weekly for one month, and then every fortnightly for next two months, and once a month, thereafter.

Figure1: Bear mauling injury with underlying facial fracture

Results

Twenty five patients of bear mauling injuries were managed in a tertiary care centre. Age of patient ranged from 5 to 55 years with males constituting 68%(17) . Head and neck region was involved in all 25 patients. Soft tissue injuries occurred in all patients with soft tissue loss in five patients and tendon injury in one patient. Facial fractures were noted in 20 patients with fracture zygoma being the commonest [zygoma(14), zygoma+nasal(6)] .[Table 1]

Table 1

S.N.	Injuries	No. of patients
1.	Soft tissue injuries	25
2.	Soft tissue loss	5
3.	Tendon injury	1
4.	# zygoma	14
5.	#zygoma+nasal	6

After surgical debridement and thorough irrigation of wounds primary repair of soft tissue was done. Soft tissue defects was managed by skin graft in three patients and random pattern flap in two patients. Modified Kessler repair was done for tendon injury in one patient.

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Facial fractures were managed with open reduction and internal fixation with miniplate and trans-osseous wire fixation in twenty patients.[Table 2]

Table 2

S. N.	Procedure	No. of patients
1.	Primary repair	25
2.	Skin grafting	5
3.	Regional flap	2
4.	Tendon repair	1
5.	Miniplating and trans-osseus wire fixation	20

Patients were followed up for minimum period of 14 months. Two patients had wound infection which resolved after regular dressings and systemic antibiotics. Other complications like hypertrophic scars (8 patients) , facial nerve palsy(4 patients) and ectropion (two patients) were treated successfully later on.[Table 3]

Table 3

S.N.	Complications	No. of patients
1.	Wound infection	2
2.	Hypertrophic scar	8
3.	Facial nerve palsy	4
4.	Ectropion	2

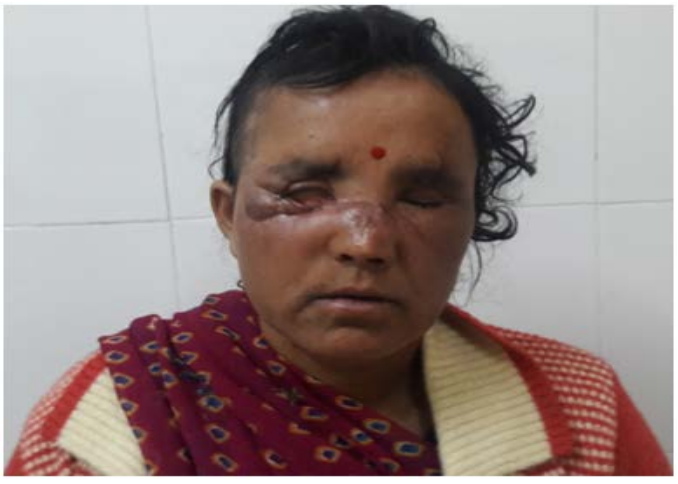

Figure 2: Post operative view with ectropion

Discussion

Majority area of state of Uttarakhand is covered by forests. Sushila Tiwari Institute is situated in foothills of Himalayas so many patients of human wild life conflict injuries are reported here.

Habitat degradation, increase in wild animal population and expansion of human population are the main reasons behind the man-wild animal conflicts.[1]Those residing in the vicinity of the forests and reserves bear the brunt of such conflicts.

Majority of patients reported were farmers, van gujjars or forest guards. Medical care was delayed in tertiary care as these are located 200 km away. After getting primary treatment in health centre these patients were referred for plastic surgery consultation in tertiary care centre. There was no incidence of rabies reported in this study as wounds were thoroughly cleaned and rabies immunization was done. This in accordance with previous studies[8,9].

In this study most of patients were middle aged individuals. Most of attacks were defensive, occurred in the early morning hours. These findings are in accordance with previous studies.[7,10,11] . Head and neck region was involved in 100%(25) of patients.[5,13.14]

Facial fractures were noted in twenty patients with fracture zygoma being the commonest in 20 patients (100%) and nasal fracture in 6 patients (30%).No maxilla and mandible fracture was reported in any of bear mauling patients in this study.. Rasool et al.[5] also reported zygoma as the commonest facial fracture but Indu Bhusan Kar et al[8] t had mandible fracture as the commonest in there study..Bear mauling patients had 80% incidence of bony injury in this study. Rasool et al.[5] and Indu Bhusan Kar et al[8] also reported incidence of bony injuries (95%) and (27.09%) in there study.

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There was no damage to eyeball or vision loss in our study. Indu Bhusan Kar et al[8] reported damage to the eyeball with vision loss in 15% of the bear mauling patients.

Soft tissue injuries occurred in all patients with soft tissue loss in five patients (20%) as these injuries are usually complex. One patient had tendon injury over hand. Majority of patients (80%) were managed by primary closure. Soft tissue loss was managed by skin grafting in five patients and regional flap in two patients. Rasool et al.[5] and Indu Bhusan Kar et al[8] also reported soft tissue injuries in all bear mauling cases. Indu Bhusan Kar et al[8] also reported incidence of soft tissue loss in 25% of patients which required reconstructive procedure. Govila et al.[12] used "rib sandwich" pectoralis major island flap as a reconstructive procedure in a bear attack case.

There were no visceral or brain injuries in any of bear mauling patients in this study .These injuries have been reported in previous studies.[5,9,13,14]

These patients usually need multistage surgeries. In this study almost all patients required minimum of two surgeries. Six patients required additional surgeries for management of complications. Geetha et al[15] also recommended multistage surgeries for bear mauling injuries.

These wounds are usually prone to infection as these are contaminated with grass and oral cavity of bear is contaminated with numerous bacteria. After thorough debridement and cleaning of wound, primary repair of soft tissue was done .Once patient stabilized and wound was healthy, definitive management was planned. In this study two patients had wound infection which resolved after regular dressings and systemic antibiotics. Infection with mixed flora in animal bite cases has been reported in previous studies.[16,17]

Other complications like hypertrophic scars (8 patients) ,facial nerve palsy(4 patients) and ectropion(two patients) were treated successfully later on. These complications has been reported in previous studies.[8,18]

There was no mortality in this study as all patients were haemodynamically stable. Previous studies have reported mortality of 2.0% in bear mauling injuries[19].

Conclusion

Bear mauling injuries are complex injuries requiring prompt management. Scalp and face are the most common sites of injuries with underlying facial fractures. Primary soft tissue repair yields good results. Some injuries are complex requiring multistage surgery.

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