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Survey on Surgical Interventions with Special Reference to Prevalence of Wounds in Captive Wild Animals of Zoological Garden, Alipore, Kolkata^

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ABSTRACT

Modern zoos play an important role in conservation of wild animals. Occurrence of wounds and different minor surgical interventions are very common in zoo animals. Data related to surgical interventions(N= n + n_1= 241) from March, 2009 to February, 2014 in Alipore zoological garden, Kolkata, India was collected from the available registers and analyzed after dividing into minor and major surgical interventions. The major surgical interventions (n = 8) were consisted of chronic vaginal prolapse management, caudectomy, tumour excision, fracture management. Similarly, the minor surgical interventions (n_1 = 233) related to management of conditions like wounds and abscesses were documented in this study. Prevalence of wounds in mammals was 88.84%, 2.15% in reptiles and 9.01% in birds. Infighting injury and horn injury was very commonly observed etiology of wound in varied species of captive animals. Maggot infestation was also common in wounds irrespective of species. Recurrence as well as chronic wounds was evident in many species. Preventive measures suggested for reducing or preventing occurrence of wounds and other surgical diseases.

Key words: *Captive wild animal, Surgical interventions, Alipore Zoological Garden, Kolkata, Wounds.*

INTRODUCTION

Wildlife population in their habitat is declining day by day. Under this situation the modern zoos play an important role in their conservation. It could be successfully achieved through maintaining optimum health with minimum chronic stress[1]. Surgical interventions can be classified into major and minor interventions. Major surgery is relatively more difficult to perform than minor surgery and it involves life risk of the patient eg. Tumor excision, fracture management, amputation etc. Minor surgery is surgery which is relatively simple to perform having no risk on the life of the patient eg.

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Management of Wounds, superficial abscess etc[17]. Occurrence of different types of wounds and other minor surgical interventions is very common in zoo animals and this is major concern for veterinary section of any zoo. Zoo animals are usually uncooperative and self mutilation is common phenomenon. Hence, the management of zoo animal that has undergone surgery becomes more difficult, and emphasizes the need for as minimally invasive surgery as possible, with the techniques holding the best likelihood of success. The need to perform complex surgery is very rare, and so it is almost impossible to build up a series of similar cases to be able to scientifically evaluate the best techniques associating the risk and complications in a single zoo. Published data regarding prevalence of surgical diseases, wounds and abscesses in captive animals are very few. Therefore a retrospective study was undertaken with analysis of records related to the surgical interventions (major and minor) at the Alipore zoo to evaluate morbidity of surgical diseases as well as wounds to suggest possible management measures to minimize morbidity of wounds. This zoological garden is one of the oldest zoos in India which was established in 1875. This is now a medium type of zoo, as per the norms of Central Zoo Authority, New Delhi, India.

MATERIAL AND METHODS

The information on surgical interventions of captive wild animals was obtained from treatment registrar of Veterinary Hospital of the Zoological Garden from 1st March, 2009 to 28th February, 2014. Data related to surgical interventions in captive wild animals ($N=n_1+n$) was divided into minor (n_1) and major (n) surgical interventions.

The recurrent or chronic cases of wounds were also found out during the making of survey of minor surgical interventions. Similarly, occurrence of wounds and abscesses in mammals, reptiles and aviary species was separately found out. Major etiologies of occurrence of wounds are also found out from records. The data documented were classified and percentage values were arrived and discussed accordingly.

RESULTS

Major surgical interventions

Eight (8) cases were revealed as major surgical interventions (n) during the survey of the documents available at the zoological garden, under study (N=241), as revealed in Table 1.

Minor surgical interventions

Encountering of minor surgical interventions in dealing with wounds and abscesses in 233 cases (Table 1) regardless of groups of wild animals (96.68 percent) indicated about more number of minor surgical interventions, when compared with that in case of major surgical interventions.

The comparative percentage value of occurrence of wounds and abscesses among captive animals shows mammals (207; 88.84%) with highest percentage followed by bird (21; 9.01%) and lastly with reptiles (5; 2.15%).

Infighting injury was very commonly observed etiology of wound in varied species of captive animals, like barking deer, brow antlered deer, Black buck, bonnet monkey, rhesus macaque, common langur, marsh crocodile, salt water crocodile, painted stork, adjutant stork and black swan, during the survey. Horn injury was seen in swamp deer, black buck and giraffe. Prevalence of wound was very common among big cats. Paw was the most frequently observed site of wound. Other than paw, wounds were seen mainly in forehead and tail. Lion was frequent victim of wounds than other species of wild felids (Figure1) whereas barking deer was most frequent wound affected species among available cervids (Figure2). Self mutilated wound was evident in lion and rhinoceros. Maggot infestation in wound was frequently observed in white fallow deer, hamadryas baboon, big cats and rosy pelican. Crow pecking wound were seen in sambar deer and hippopotamus.

External abscess was seen in large Indian squirrel, barking deer, hog deer, bonnet monkey and common marmoset.

Chronic wounds and recurrence of wounds was evident in many cases. Some of the major chronic recurrent cases enlisted below

- Crow pecking chronic wound in a male sambar deer
- Chronic suppurative wound in elbow of a male nilgai.
- Vulval maggoted wound in Hamadryas baboon
- chaining wound in elephant
- Maggoted wound in partially docked tail of a lioness
- self mutilated facial wound in a rhinoceros
- peri-cloacal maggoted wound in a rosy pelican

DISCUSSION

Number of major surgical interventions is very less in the zoo which can be corroborating with the findings of Hubbard *et al.*[8]. The neoplastic masses encountered during the survey of various clinical conditions encountered among the fields of the Alipore Zoological garden of Kolkata was in agreement with the findings of Arora[3]. Docking of tail was also common in feline species which is corroborated with findings of Olatunjiakioye *et al*[11]. Evidence of Uterine prolapse was documented in free ranging deer by Robling *et al.*[13]. Fracture management of captive animals is documented by different authors. Nath *et al.*[10] detailed about the successful fracture management in a white tiger. Gahlot *et al.*[7] described about fracture management in langur. Bennett and Kuzma[4] also described regarding fracture management in zoo birds.

Occurrence of wounds was common in wild fauna under captive conditions and was quoted by various authors. Wound and infighting injury was most common non-infectious condition found in almost all species of mammalian, avian and reptiles in different Indian zoos as per findings reported by Swarup *et al*[15]. Chaining wound in species like elephants could happen due to trauma caused by the chaining, as described by Fowler[6].

Prevalence of wound was very common among big cats which were in agreement with the reports given by swarup *et al*[15]. Dolins[5] described that captive environment could have adverse effect on behavior of zoo animals like self mutilation, stereotypic pacing etc. Large felids of the zoo regularly given chemo-prophylaxis against Trypanosomiasis through subcutaneous injection of triquin (Quinapyramine salt) over paw which cause local tissue necrosis[16], is also an inciting factor for wounds in large felids of the zoo.

Wounds in warmer months of the year were in danger of attracting flies that would invade any wound. Also, contrary to popular opinion, flies would attack healthy animals that had some kind of contaminations on them, sometimes, as stated by Stocker[14]. Kumar and Raj[9] described that maggot infestation in wild animals may leads to loss of wild fauna in captive as well as in free range wild animals.

Regarding Crow pecking wound Vantassel[18] documented that vultures, crows, magpies and some gulls commonly scavenged carcarsses but in some circumstances they might attack live animal causing various damages.

Wound healing in animal is sensitive to social, environmental and physiological factors. Wound healing is sensitive to any stress response as mediated by gluco-coticoid hormones of hypothalamic-pitutary axis. Negative Stress is also associated with slow wound healing in wild animals[2]. In this study chronic and recurrent case of wounds may be due to impact of negative stress.

Rao and Acharjyo[12] emphasized the need of good management practices to minimize or eradicate diseases in the wild felids.

Based on the findings made during this study, following steps are recommended to prevent occurrence of wounds and recurrence of the same.

- Separation of animals according to the biological features of the wild animal species in order to control infighting injury
- Avoid over-crowding of any species of wild fauna to reduce infighting etc.
- Arrangement of netting over enclosures of target species of crow to reduce crow pecking wound.
- Use of rubber covering over chain used for prevention of wound in limbs of elephant.

TABLE 1: YEARLY ABSTRACT OF SURGICAL INTERVENTIONS SURVEYED AT ALIPORE ZOO FROM March, 2009 to February, 2014 (N=241=n+n_1)

Type of Surgery	Description of surgical condition	2009 (Mar-Dec)	2010	2011	2012	2013	2014 (Jan-Feb)
Major Surgery (n=8)	Vaginal Prolapse		1(Black buck)				
	Caudectomy		1(Tiger)		1(Lion)		
	Tumor			2 Jaguar(Male)-Sebaceous gland tumor Jaguar (female)-Mammary gland tumor			
	Fracture			1 (Langur-humerus fracture)	1 (Painted stork-tarsometatarsal fracture)	1 (White tiger-humerus fracture)	
Minor Surgery (n_1=233)	Wounds and abscesses	38	56	59	40	33	7

FIGURE 1: Frequency of wound in felids over the total period of study

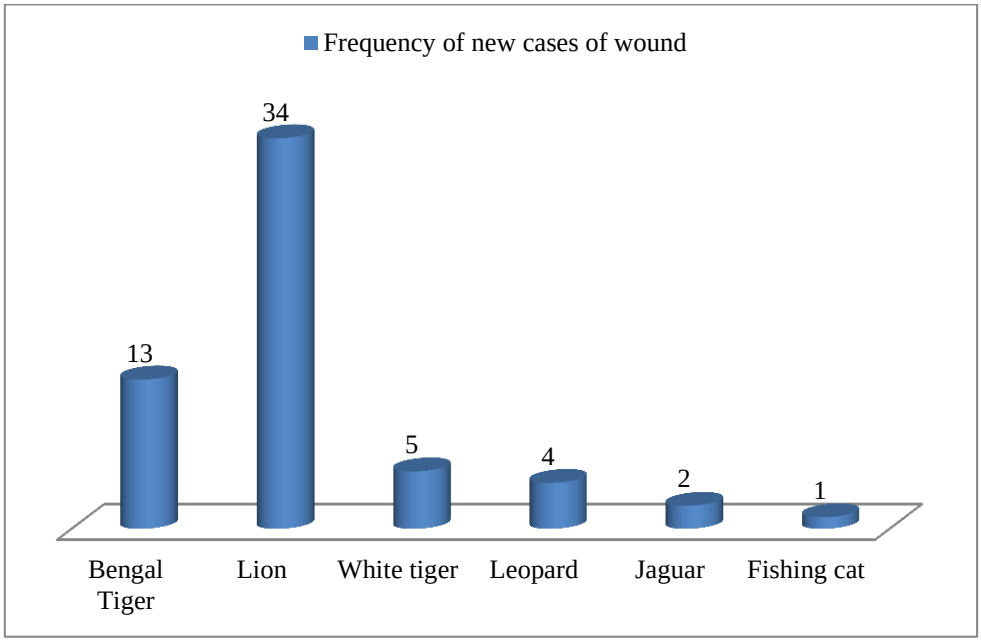
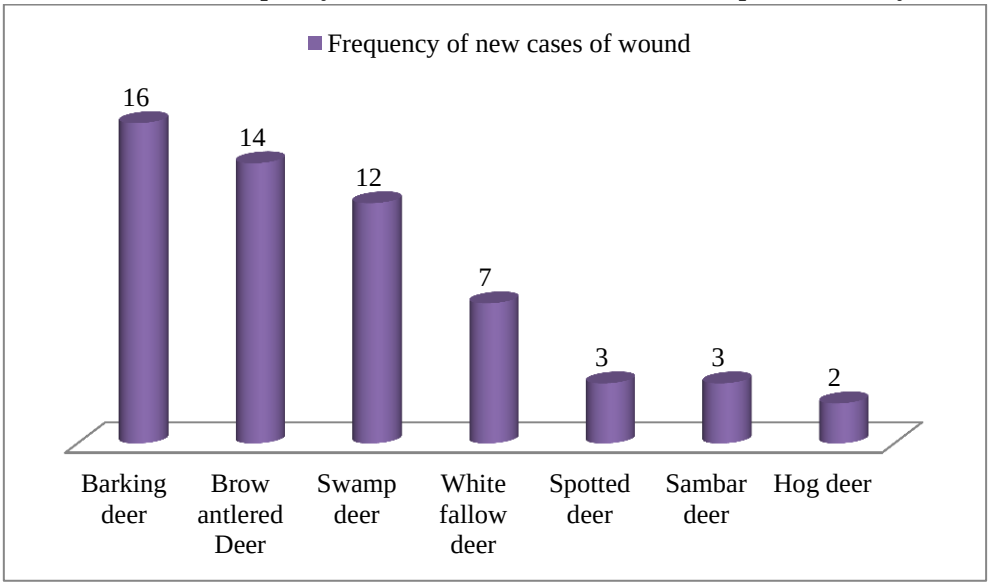


FIGURE-2 Frequency of wounds in cervids over the total period of study



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