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## A RETROSPECTIVE STUDY ON THE OCCURRENCE OF SURGICAL AFFECTION IN ZOO CARNIVORES OF THE NATIONAL ZOOLOGICAL GARDEN AT DHAKA, BANGLADESH

Zaied Talukder<sup>1†</sup>, Nazmul Hoda<sup>3†</sup>, Pankaj Kumar Jha<sup>1,2</sup>, Pravin Mishra<sup>4</sup>, Moumita Kalowar Momy<sup>1</sup> and Md. Mahmudul Alam<sup>1\*</sup>

† contributed equally

<sup>1</sup>Department of Surgery and Obstetrics, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh, Bangladesh; <sup>2</sup>Animal Breeding Division, Nepal Agricultural Research Council, Nepal; <sup>3</sup>Upazilla Livestock Officer (Leave/Reserve), Department of Livestock Services; attached to: Bangladesh National Zoo, Mirpur, Dhaka; <sup>4</sup>Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh, Bangladesh.

\*Corresponding author: Md. Mahmudul Alam; E-mail: mahmuddso2004@gmail.com

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### ABSTRACT

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This study was carried out to investigate the occurrence of various surgical affections often encountered in carnivorous zoo animals of National Zoological Garden, Dhaka, Bangladesh. The study was based on the surgical cases reported in the day record book maintained by the zoo authority during the period of January - December 2012 to January - December 2016. Of 74 surgically affected zoo carnivore's cases; Felidae recorded highest 81.08 %, Canidae 12.61 % and Ursidae 6.76 %. When affections were compared between sexes, it was observed higher in male 62.16 % than in female 37.84 %. Among the different surgical affections; the wound cases were observed at the apex with 29.7 % and 18.9 %, followed by paralysis 10.08 % and 6.8 %, skin injury 9.5 % and 6.8 %, myiasis 4.1 % and 2.7 %, lameness 2.7 % and 4.1 % in male and female, respectively. While, tail sore 1.4 %, conjunctivitis 1.4 % and hoof injury 1.4 % were observed in male carnivores only. In conclusion, this report signifies the common surgical affections suffered by zoo carnivores, while male carnivores showed comparatively more prone to affections than female one. This report may be helpful to develop a control strategy in managing zoo animal captivity and further minimizing these surgical affections.

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## INTRODUCTION

Wild animals have been maintained in captivity ever since human civilization (Fowler, 1996). Human established zoo as a park or garden facilitated with various types of wild creatures (animal, birds, and reptiles) managed in a captive state for the recreation purpose. Wild animals including both carnivores and herbivores in National Zoological Garden play very significant role for both visitors and researchers. It is very important to know about their behavior, feeding habit, breeding, and their values for proper understanding of wild life for researchers. Current zoos play an essential part in conservation of biodiversity. Zoo also facilitates reproduction of captive animals. Like other animals, the zoo animals often suffers with different types of diseases and surgical affections may due to unmanaged captivity practices, geo-climatic environment, abrupt changes in normal habitat and or competitive nature. Others factors includes; species, ages, sex of the animals and season of the year (Samad, 2000). Generally veterinarians are recruited in the zoo for health care of the wildlife (Reading et al., 2013), immobilization, capture, translocation (Ewen et al., 2015), population management (Wikler et al., 2014) and, actively participate in conservation programs (Kelly et al., 2013). Most of the diseases can be treated with medicine only; while few cases need surgical intervention. The surgical procedures fall into three broad categories: orthopedics, soft tissue surgery and neurosurgery (Fowler, 1996). It is important to know the overall scenario of these surgical affections during the period which will be a guideline and may be of useful in making future strategy in developing the zoo management. To the best of our knowledge, there is scar of documented paper on surgical affection of wild animals of national zoological garden - Dhaka. Therefore, this study was aimed with the objective to figure out the occurrence of various surgical affections of wild carnivores animals in Dhaka zoo.

## MATERIAL AND METHODS

The study was based on the basis of record book maintained by the Veterinary hospital of Bangladesh National Zoo, from the period of 2012 to 2016. A number of 74 surgically affected wild carnivores animals were considered as sample. Data were organized in the Microsoft Excel spreadsheet and percentages of surgical affections in different species were calculated. The percentage of occurrence of surgical affections was determined using following formula:

$$\text{Occurrence (\% of Surgical Affection)} = \frac{\text{Number of Cases}}{\text{Number of individuals in the study}} \times 100$$

## RESULTS

### Occurrence of surgical affections in carnivorous zoo species

A total of 74 surgically affected wild carnivores were recorded from dated 2012 to 2016. The highest occurrence of surgical affection was observed in Felididae 81.08 % followed by Canidae 12.16 % and Ursidae 6.76 % (Figure 1).

### Various surgical affections and their occurrence in carnivorous zoo species

The various surgical affections and their occurrence are shown in Figure 2. Among the total recorded 74 surgical affections cases, the wound was observed highest 48.65% followed by paralysis 17.57 %, skin injury 16.22 %, lameness 6.76 %, myiasis 6.76 % and others 4.05 %.

### Occurrence of surgical affections in different sex of carnivorous zoo species

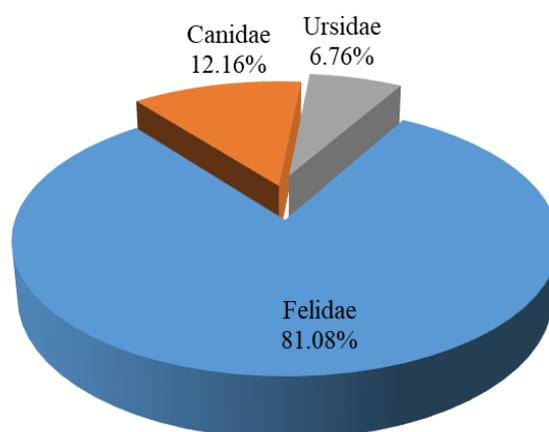
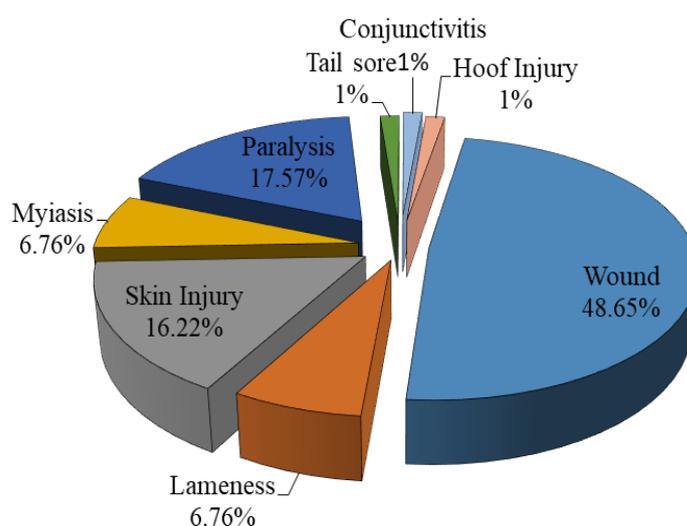
When comparing the sex in relation to surgical affections, the occurrence of surgical affections was observed higher in male 62.16 % than females 37.84 % (Table 1).

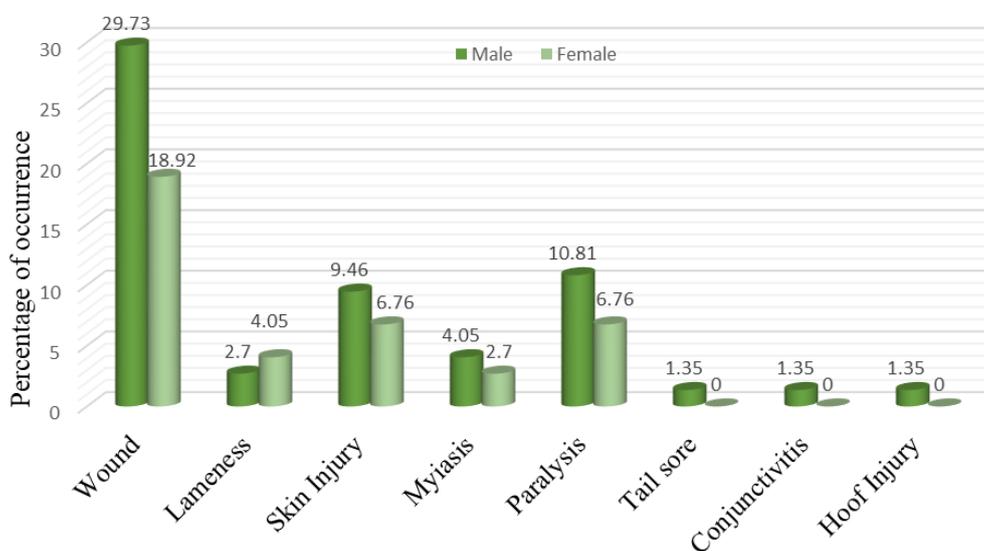
**Table 1.** Occurrence of surgical affection in different sex of carnivorous zoo species

| Sex    | Total no. of affections recorded | Number of specific affections | Affection (%) |
|--------|----------------------------------|-------------------------------|---------------|
| Male   |                                  | 46                            | 62.16         |
| Female | 74                               | 28                            | 37.84         |

#### Various surgical affections and their distribution in male and female of carnivorous zoo animals

When comparing various types of surgical affections between male and female carnivorous zoo, wound affections was recorded highest 29.7% in male than in female 18.9% and, accordingly down occurrence followed by paralysis 10.8% in male and 6.8% in female; skin injury 9.5% in male and 6.8% in female; myiasis 4.1% in male and 2.7% in female; lameness 2.7% in male and 4.1% in female; and 1.4% each in male for tail sore, conjunctivitis and hoof injury, respectively (Figure 3).

**Figure 1:** Occurrence of surgical affections in carnivorous zoo species**Figure 2:** Surgical affections and their percentage of occurrence in carnivorous family



**Figure 3:** Surgical affections and their occurrence in different sex of carnivorous family

## DISCUSSION

Zoo animals are prone to various surgical affections. In investigating the overall surgical affections during the period of 2012 to 2016 recorded in the Veterinary Hospital of National Zoological Garden- Dhaka; the overall occurrence of surgical affections was higher in family Felidae 81.08 % followed by Canidae 12.16 % and Ursidae 6.76 %. There is no such type of previous investigated reference or published paper on surgical affections on carnivorous zoo animals to compare and contrast our finding.

The occurrence of surgical affections was higher in male than female i.e. in male it was 62.16% and in female 37.84%. Zoo animals are usually polygemic that's mean they need above forty times mating in twenty four hours both for male and female. But in Dhaka zoo, maximum male animals are more than ten or eleven years for that reason, they can't copulate above forty times in twenty four hours, they copulate only twelve to fifteen times a day, so female's desire are not fulfill then to fulfill their desire they attack the male and injured them. That's why male are injured than female animals in Dhaka zoo.

Paralysis was the second most common surgical affections seen in our study. Paralysis is most often caused by damage in the nervous system, especially the spinal cord. Other major causes are stroke, trauma with nerve injury, poliomyelitis, cerebral palsy, peripheral neuropathy, Parkinson's disease, ALS, botulism, multiple sclerosis, and Guillain-Barré syndrome (Workowski and Berman, 2006). In our study, the percentage of occurrence of paralysis was 17.57% where 10.8 % in male and 6.8 % in female. Paralysis may be due to faulty darting, nerve injury, sprain etc. The cessation of spinal cord function can result in paralysis of lower extremities (Saladin and Kenneth, 2012).

Skin Injury was very much common in the zoo animals. Injuries in immature animals may result from falls during active play (Bulstrode *et al*, 1986). The percentage of occurrence was 16.22 % (in male 9.5 %, in female 6.8%). Hoof Injury was not uncommon and its percentage of occurrence was 1.4 % and only shown in male. This type of injury may be due to faulty management in the cage or free range area due to excessive running. Myiasis is resulted from the invasion of tissues by dipterous larvae which feed on the host's live or dead tissues and body fluids (Zumpt, 1965). The percentage of occurrence of Myiasis was 6.76 in which male was 4.1 % and female 2.7 %. Higher prevalence of myiasis had been reported by authors in different areas for example, 14% in Saudi Arabia (Shehada, 2005), 5.08% in Turkey (Karatepe *et al.*, 2008) and 5 % in France (Boulard *et al.*, 2008). The percentage of occurrence of lameness was 6.76 % where male was 2.7 % and 4.1 % in female. Lameness may be due to injury or fracture during fighting, running and falling etc.

## CONCLUSION

In the end of this study, it is concluded that zoo animals are susceptible to different surgical affections with high percentage recorded in male than in female species. This study may be a guideline for managing and taking proper precautions for upcoming surgical affections.

## CONFLICT OF INTEREST

The author does not have any conflict of interest.

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