

## INCIDENCE OF FRACTURE IN DOG: A RETROSPECTIVE STUDY<sup>#</sup>

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### ABSTRACT

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A retrospective study was conducted to determine the incidence of bone fracture in dogs presented at T.V.C.C., Mhow and Government hospitals of Indore. A total number of 14,754 dogs were presented for various ailments, out of which 169 cases were of fracture which constitutes 1.14% incidence of fracture in dogs. It was observed that fracture was more in femur followed by tibia-fibula, radius-ulna and humerus. Trauma in the form of automobile accident was principal cause of fracture. Dogs in the age group of 1-6 months showed highest occurrence in comparison to other age group. Occurrence was higher in non-descript breed followed by Labrador, German shepherd, Pomeranian/Spitz and others. Transverse fracture were most commonly encountered followed by oblique, spiral, multiple and comminuted fracture as per the data.

**Key words:** Bone, fracture, dogs, incidence

### Introduction

Long bones are subjected to physiological and non physiological forces. Non physiological forces occur in unusual situations, such as automobile accidents, gunshot injuries and falls. These forces can be transmitted to bone directly and may exceed the ultimate strength of bone, causing a fracture. Physiological forces transmitted to the bone through the joint surfaces and muscle contraction when exceed the ultimate strength of bone, responsible for fracture. Dogs constitute the majority of domestic pet population. These pets are prone to appendicular bone fractures, which are frequently caused by traumatic injuries or bone pathology. A retrospective study was carried out with the objectives of determining the types and frequency of fractures in dogs.

### Materials and Methods

The incidence and distribution of bone fracture in dogs was evaluated for a period of 16 months (from January, 2016 to April, 2017) at Teaching Veterinary Clinical Complex (TVCC), Mhow. The data was also collected from all government hospitals located at Mhow and Indore city to interpret the incidence of fracture in dogs. All the available records and radiographs were screened and the information regarding the incidence and different types of fractures were tabulated.

### Results and Discussion

A total number of 14,754 dogs were presented for various ailments, in Government Veterinary hospitals of Indore and TVCC, Mhow (M.P.), out of which 169 cases were of fracture. Therefore incidence of fracture accounted as 1.14% in dogs. Most fractures occurred from indirect trauma, force was transmitted to a bone in a specific fashion and at a "weak link" within the bone, causing a fracture to occur (Newton and Nunamaker, 1985).

In the present study occurrence of fracture was more in femur (35.50%) followed by fracture of tibia-fibula (28.99%), radius-ulna (18.34%), humerus (10.05%) and other bones viz. metacarpal, metatarsal (4.73%) and vertebrae (2.36%) were affected less commonly in the present study (Fig. 1). Present

study showed that hind limb affected more as compared to the fore limb. A high incidence of femur fracture has also been reported by several other researchers (Harasen 2003; Beale, 2004 and Elzomor *et al.*, 2014). This indicates that the presence of abundant muscle do not protect the femur from getting fractured (Markel *et al.*, 1994). In automobile accidents, mostly animal are likely to be hit from behind, as the animals were slow to react from their hind quarters, might be the cause of more fracture in hind limb. It is possible that animal might see the impending trauma coming and their effort to flee could expose their hind limbs to the major force of impact. Further, a trauma to the caudal half of the animal would be less likely to produce life-threatening injury, and such animals might be presented for treatment (Harasen, 2003).

The fracture of right hind limb fracture (50.00%) was more, followed by left hind limb (38.88%), left forelimb (5.55%) and right forelimb (5.55%). However, the right limb was slightly more commonly affected (52.01%) than the left limb (47.99%) among all the long bones. Rani *et al.* (2004) and Simon *et al.* (2011) also reported higher occurrence of fractures in the right limb.

The fractures were recorded in age group from 1 month to 11 years. Dogs falling in the age group of 1-6 months showed highest occurrence (49.71%) of fracture followed by 7-12 months (20.11%), 4-5 years (10.65%), 1-2 years (7.69%), 6-7 years (7.10%), 3-4 years (3.55%) 10-12 years (1.18%) during the present observation period (Fig. 2). Rao *et al.* (1999) also reported highest occurrences of fracture in younger animals. This might be due to fact that the young ones are more active and are not learnt to cope with hazards unlike their older counterparts (Kolata *et al.*, 1974). Further, cortices of young dogs are comparatively thinner than the adult, so could not resist even minor trauma resulting in fracture (Schwarz, 1991; Aithal *et al.*, 1999).

The breed wise study revealed that the occurrence of fracture were highest in non-descript dogs (27.81%), followed by Labrador (21.89%), German shepherd (21.30%), Pomeranian/spitz (20.11%), Doberman (3.55%) and Great

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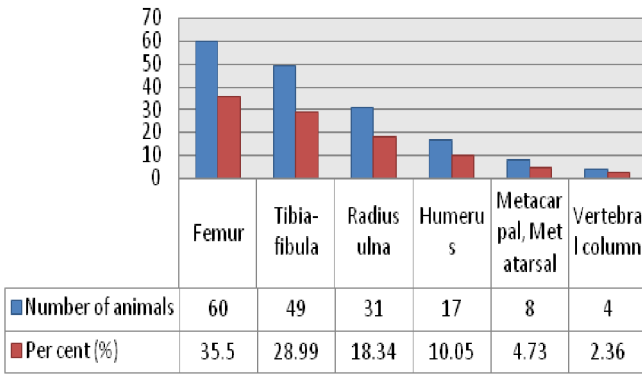


Fig. 1: Incidence of fractures according to the bone involved

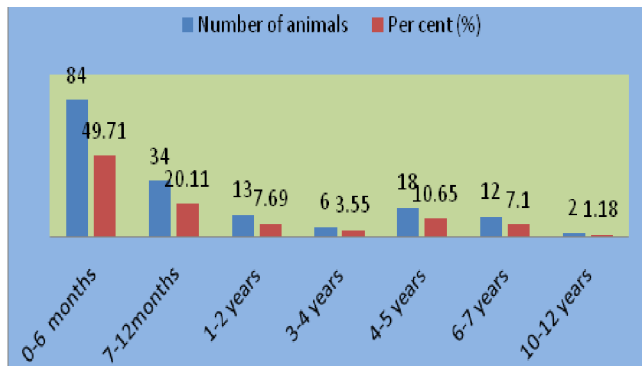


Fig. 2: Incidence of fracture according to age

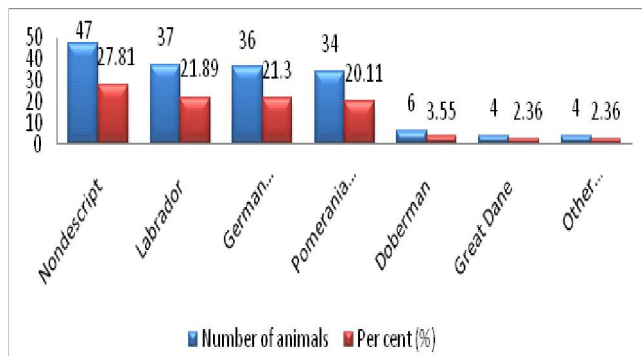


Fig. 3: Incidence of fracture according to breed

Dane (2.36%). The breeds like St. Bernard (0.59%), Rottweiler (0.59%), Mastiff (0.59%), Dalmatian (0.59%) were less commonly affected in the present study (Fig. 3). Similarly, Sran *et al.* (2016) recorded higher incidence of fracture in non-descript (43.90%) breed of dog, followed by German Shepherd (11.56%), Labrador (10.5%) and others. In the present study higher incidence in non-descripts dogs might be due to the higher population and free living nature of these dogs making them more prone to automobile accidents (Aithal *et al.*, 1999).

The present study revealed that the male dogs (65.68%) are more prone to fracture in comparison to female dogs (34.35%). Balagoplan *et al.* (1995), Gahlod *et al.* (2002) and Kumar *et al.* (2013) also reported higher incidence of long bone fracture in male than the females. This might be attributed to the fact that male dogs are more aggressive and tend to wander more than their female counterparts, thus they are

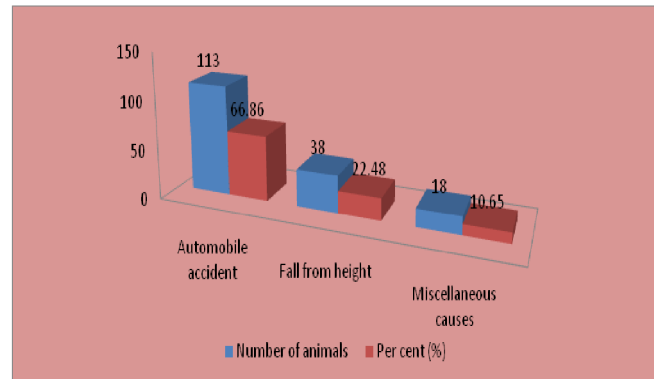


Fig. 4: Etiology of fracture

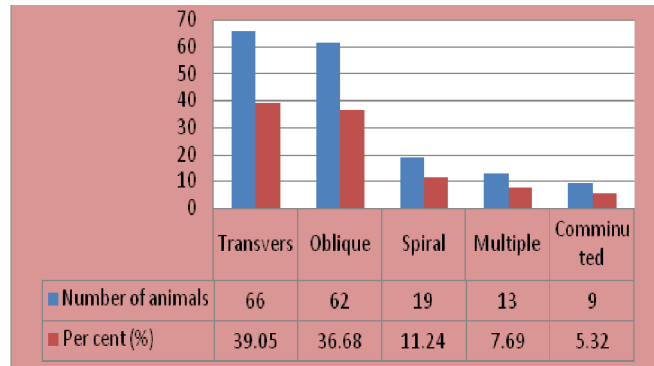


Fig. 5: Incidence of fracture according to the type

more vulnerable to fractures (Kolata *et al.*, 1974). Further this could also be due to the fact that people like to have male dog more than female dogs, which might be responsible for more population of male dogs.

Automobile accident was recorded as the major cause of fracture (66.86%), followed by fall from height (22.48%). The other causes of fractures in dogs were dog bite (5.32%), hitting by object (3.55%), unknown etiology (1.18%) and caught in wire fencing (0.59%) (Fig. 4). Several other workers had also reported that road traffic accident were the major cause of fractures in dogs (Scott, 2005; Jani *et al.*, 2014). The increase in road traffic and the urban pet population might be the possible reasons for more number of accidents (Aithal *et al.*, 1999).

The incidence of fracture based on type of fracture revealed that transverse and oblique fracture had highest frequency in long bones. Transverse fracture (39.05%) were most commonly encountered followed by oblique (36.68%), spiral (11.24%), multiple (7.69%) and comminuted fracture (5.32%) as per the data collected (Fig. 5). Other workers also reported high occurrence of transverse fracture followed by oblique and comminuted (Sirin *et al.*, 2013 and Rhangani, 2015). Higher incidence of oblique/transverse fracture indicates that the predominance of bending or compression forces as the cause of fracture (Smith, 1985). It was concluded in present that the incidence of fracture in dogs was 1.14% in dogs. The incidence of fractures were more common in young animals below one year of age, nondescript breed was more commonly affected. Femur fracture was higher than that of other bone, mostly involved right side, males were affected more and automobile accident was main cause of fracture in dogs.

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