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Clinical study on the distribution of long bone fractures in canines

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Abstract

A systematic survey was undertaken to evaluate the incidence and pattern of long bone fractures in dogs reported to the Department of Veterinary Surgery and Radiology, College of Veterinary Science, Proddatur. The data was collected and analysed over a period of twelve months (June 2025 to May 2026). The femur exhibited the highest incidence of long bone fractures (46%), followed by the tibia and fibula (28%), radius-ulna (15%) and humerus (11%). A greater occurrence of fractures was observed in male, non-descriptive breed young dogs under aged 6 months of age. Mid-diaphyseal transverse fractures represented the most frequently encountered fracture type, while automobile accidents were identified as the leading cause of long bone fractures.

Keywords: Incidence, long bone, dogs, fracture

Introduction

In companion animals, injuries affecting the musculoskeletal system are quite prevalent and fractures involving long bones are among the most frequently noticed fractures. As pet ownership continues to rise, bone fractures are increasingly recognized as an important health issue in dogs (Ali, 2013) [2]. The study of incidence of long bone fractures provide a systematic understanding of their occurrence with respect to variables such as breed, age, affected bone, fracture type, and anatomical location Examining the patterns and frequency of different fracture types can provide valuable insight for advancing treatment methods used in canine fracture fixation (Aithal *et al.*, 1999) [1]. The present article gives an idea about fracture distribution in and around College of Veterinary Science, Proddatur.

Materials and Methods

The study was conducted on incidence of long bone fractures in dogs presented to the Department of veterinary Surgery and Radiology, College of Veterinary Science, Proddatur during the period of the study (June 2025 to May 2026). Detailed case history and signalment were documented for all animals. Radiographic evaluation of the affected limbs was performed in standard orthogonal views, including craniocaudal and mediolateral projections, to identify the fracture site and pattern.

Results

Bone-wise incidence

Among 46 cases of various long bone fracture presented during the study, the femur bone was seen commonly affected n= 21 (46%) cases, followed by the tibia n=13 (28%) cases, radius-ulna n= 7 (15%) cases, and humerus n= 5 (11%) cases (Fig. 1).

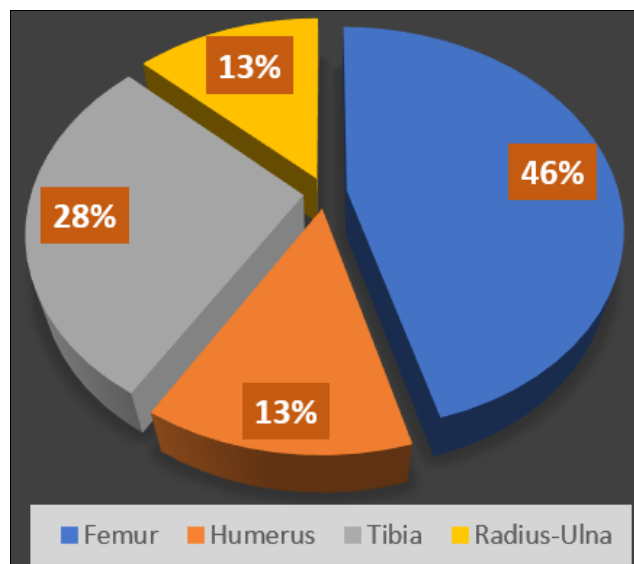


Fig 1: Pie diagram showing bone wise incidence of long bone fractures in dogs

Age-wise incidence

The age-wise distribution of long bone fractures is summarized in Fig. (2). The present study comprised dogs with varying ages. A significantly higher incidence of long bone fractures was observed in dogs within the 0-6month age group (n = 31; 67%), followed by 7 month - 1 year (n = 9; 20%). Dogs older than 12 months accounted for the remaining cases (n = 6; 13%). The results suggest that younger dogs, particularly during the active growth period are more prone to long bone fractures.

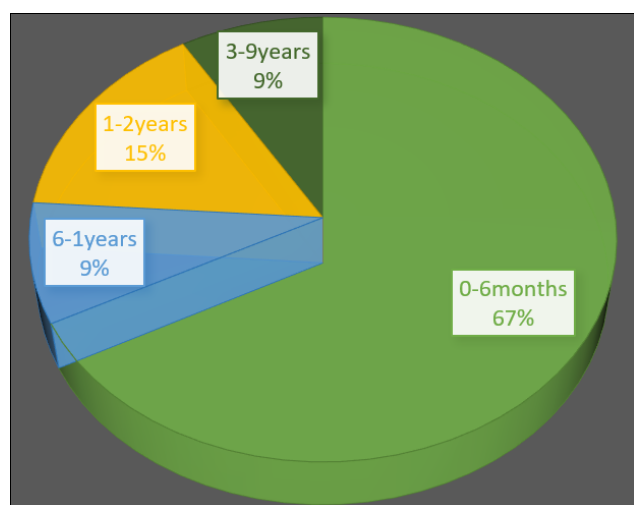


Fig 2: Pie diagram showing Age wise incidence of selected criteria cases

Sex wise Incidence

In the present investigation, a higher incidence of fractures was recorded in male dogs (n = 29; 63%) compared to female dogs (n = 17; 37%) (Fig. 3).

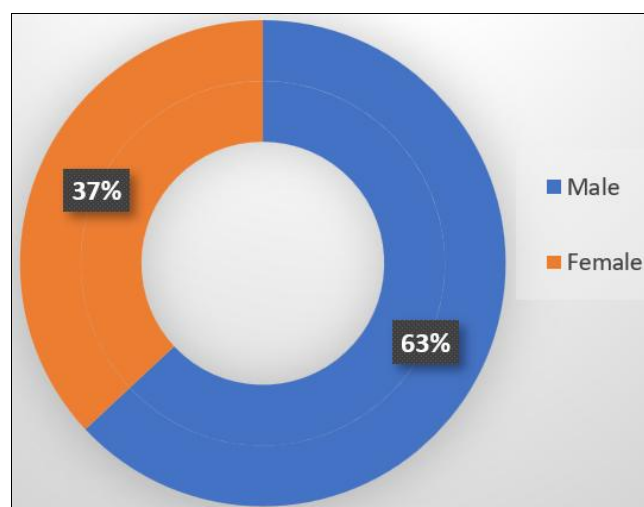


Fig 3: Doughnut diagram showing sex wise incidence of long bone fractures in dogs

Breed Wise Incidence

The distribution of long bone fracture across breeds as shown in Fig. 4 indicated that non-descriptive dogs (57%, n= 26) were most frequently affected, followed by Labrador retriever (20%, n= 9), Pomeranian (13%, n= 6) and German shepherd (11%, n= 5).

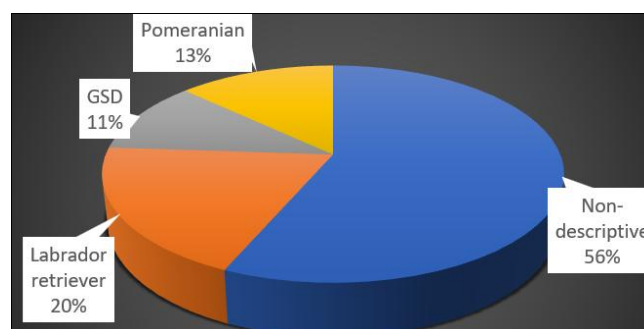


Fig 4: Pie diagram showing breed wise incidence of long bone fractures in dogs

Incidence based on aetiology

Automobile accidents were the most common cause of fractures which accounted for 48% (n=22 cases) followed by fall from height in 24% (n=11 cases) and dog bite in 24% (n=11 cases). In the remaining 4% cases (n=2), fractures were due to the hit by objects (Fig. 5).

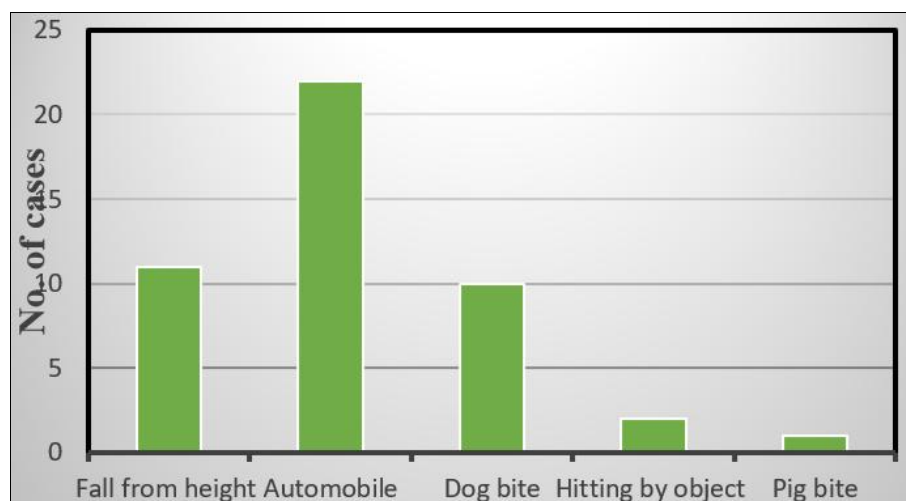


Fig 5: Bar diagram showing aetiology of fracture in dogs

Incidence of type of fracture

In the present study, transverse fractures constituted the majority of cases (n = 23; 50%), followed by oblique fractures

(n = 8; 17%), spiral fractures (n = 7; 15%), comminuted fractures (n = 6; 13%) and greenstick fractures (n = 2; 4%) (Fig. 6).

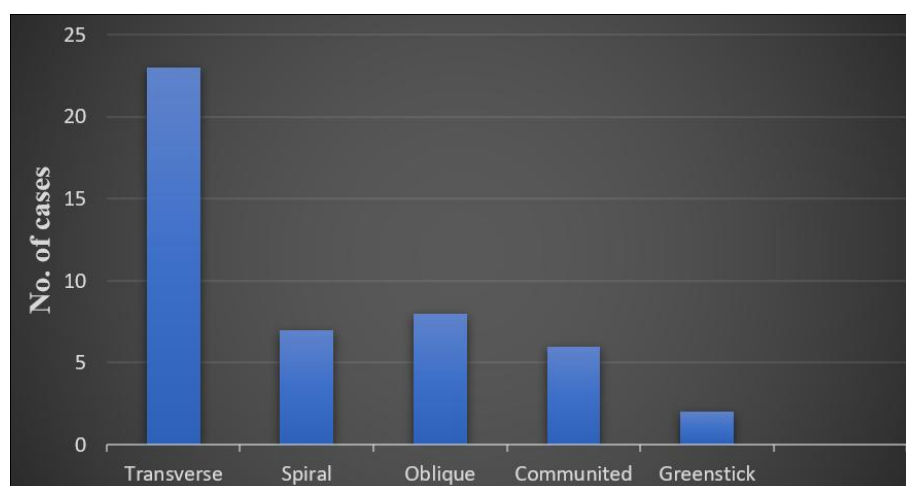


Fig 6: Bar diagram showing type of long bone fractures in dogs

Discussion

Bone wise incidence of long bone fractures recorded in the present study was similar to Fazili *et al.* (2005) [5], Jani *et al.* (2014) [6], Harish Kumar *et al.* (2020) [8], Usadadiya *et al.* (2020) [18] and Narendra Bhargav *et al.* (2024). This might be attributed to the length of femur which is around two quarters of the hind limbs and therefore had greater and easier exposure to the impact force. On contrary, Sumiran *et al.* (2021) [16] and Ravi Kumar *et al.* (2022) reported that highest incidence in tibia-fibula, whereas Aravind Kumar *et al.* (2023) reported higher incidence of fracture in radius-ulna.

The increased occurrence of fractures in younger dogs (0-6 month) in the present study could be related to their active and playful nature, which might exposed them to a higher risk of injury. Compared to older dogs, younger animals tend to be more inquisitive and have a limited ability to recognize or avoid potential hazards. Furthermore, the thinner cortical bone present in young dogs may reduce their ability to tolerate even minor traumatic forces, thereby increasing their susceptibility to fractures (Bidari *et al.*, 2023) [3]. Similar findings were reported by Jain *et al.* (2018), Kallianpur *et al.* (2018) [7], Sumiran *et al.* (2021) [16], Sriharsha *et al.* (2024) [14], Danush *et al.* (2025) [4].

The present study found higher incidence of fractures in male dogs which is similar to findings of Shiju Simon *et al.* (2011),

Bhushan Kumar *et al.* (2020) [8], Aravind Kumar *et al.* (2023) and Surya Lakshmi *et al.* (2024). This might be attributed to more active as well as aggressive behaviour of male dogs and greater tendency to roam, which increased their exposure to trauma and consequently elevated the risk of fractures (Kolata *et al.*, 1974) [12].

Breed-wise distribution indicated a higher occurrence of long bone fractures in non-descriptive dogs, followed by Labrador, German Shepherd and Pomeranian breeds. These findings were in accordance with Randhir Singh *et al.* (2015) [13] and Swaroop *et al.* (2023) [17]. The higher incidence observed in non-descript dogs might be associated with their larger population and greater tendency to roam freely, which could increase their exposure to road traffic accidents (Bidari *et al.*, 2023) [3].

Now-a-days automobile accidents constitute major cause of fractures due to increased urbanization and vehicular movement (Sumiran *et al.*, 2021; Bidari *et al.*, 2023 and Dhanush *et al.*, 2025) [16, 3, 4]. Animals are often struck from behind during such incidents because of delayed hindquarter responses (Kallianpur *et al.*, 2018 and Bidari *et al.*, 2023) [7, 3]. The fracture pattern observed in this study revealed a predominance of transverse fractures followed by oblique, spiral, comminuted and greenstick fractures. Similar observations were reported by Bidari *et al.* (2023) [3], Palle *et*

al. (2023) ^[11], and Swaroop *et al.* (2023) ^[17], This indicates that bending or compressive forces are the predominant forces responsible for fractures.

Conclusion

The present study concludes that young, male, free-roaming non-descriptive dogs are at higher risk for long bone fractures in this region, with automobile accidents as the principal etiological factor. The predominance of transverse, mid-diaphyseal fractures is consistent with direct blunt-force mechanisms associated with vehicular and fall injuries. Clinically, awareness of the fracture patterns can help veterinarians to anticipate the likelihood of fracture type and further to prepare for stabilization and fixation strategies. From a public-health and preventive standpoint, efforts should be made to reduce road traffic injuries (owner education, leash/control measures, traffic calming near residential areas) and targeted supervision of young dogs could lower the incidence of traumatic long bone fractures.

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Conflict of interest

The Author (s) declares that there is no conflict of interest.

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