



ISSN: 2456-2912

VET 2024; 9(5): 800-803

© 2024 VET

www.veterinarypaper.com

Received: 14-08-2024

Accepted: 21-09-2024

Gali Venkata Sriharsha
Postgraduate Scholar,
Department of Veterinary
Surgery and Radiology,
Veterinary College and Research
Institute, Namakkal, Tamil
Nadu, India

Kumaresan A
Professor, Department of
Veterinary Surgery and
Radiology, Veterinary College
and Research Institute,
Namakkal, Tamil Nadu, India

Kokila S
Assistant Professor, Veterinary
Clinical Complex, Veterinary
College and Research Institute,
Namakkal, Tamil Nadu, India

Arulmozhi A
Professor, Department of
Veterinary Pathology,
Veterinary College and Research
Institute, Namakkal, Tamil
Nadu, India

Kathirvel S
Professor and Head,
Department of Veterinary
Surgery and Radiology,
Veterinary College and Research
Institute, Namakkal, Tamil
Nadu, India

Dharmaceelan S
Professor and Head, Veterinary
Clinical Complex, Veterinary
College and Research Institute,
Namakkal, Tamil Nadu, India

Corresponding Author:
Gali Venkata Sriharsha
Postgraduate scholar,
Department of Veterinary
Surgery and Radiology,
Veterinary College and Research
Institute, Namakkal, Tamil
Nadu, India

A retrospective study on the incidence of long bone fractures in dogs

Gali Venkata Sriharsha, Kumaresan A, Kokila S, Arulmozhi A, Kathirvel S and Dharmaceelan S

DOI: <https://doi.org/10.22271/veterinary.2024.v9.i5l.1814>

Abstract

A five-year retrospective study was conducted from September 2019 to September 2024 aimed to assess the incidence of long bone fractures in dogs referred to the Small Animal Surgery unit, Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal. A total of 1,950 dogs were presented with a history of long bone fractures. Femoral fractures were the most frequently observed, followed by those of the tibia-fibula, radius-ulna, and humerus. The leading causes of these fractures were automobile accidents, falls from height, fights/hunting and some of them were due to dog bites. Dogs aged 1-6 months exhibited the highest incidence compared to other age groups. The occurrence was most prevalent in non-descript breeds. Transverse fractures were the most common type, followed by oblique, spiral, multiple, and comminuted fractures.

Keywords: Automobile accidents, incidence, long bone fracture

Introduction

Musculoskeletal injuries are common in companion animals of which fractures of the long bone is a commonly encountered problem. 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. (Jain *et al.*, 2018) [7]. Fractures of the long bones, particularly the femur, the most commonly encountered fractures in canines account for 36.6 percent and are usually the result of traumatic injury. Among the long bones, the femur (37.00%) had the highest incidence of fractures in dogs, followed by the ulna (28.70%), tibia-fibula (20.0%), and humerus (7.90%), (Kallianpur *et al.*, 2018) [8]. The majority of femoral fractures in dogs are diaphyseal oblique fractures (Rani *et al.*, 2007) [12]. Dogs constitute the majority of the 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 to determine the types and frequency of fractures in dogs.

Materials and Methods

The incidence and distribution of bone fractures in dogs were evaluated for a period of five years, from September 2019 to September 2024. A total of 1,950 dogs were presented with a history of long bone fractures to the Small Animal Surgery unit, Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal. A complete history and signalment of each case were recorded, and the incidence of long bone fractures was analysed based on factors such as age, breed, sex, body weight, and fracture etiology. A comprehensive clinical examination was conducted to identify the affected bone or limb, associated injuries, and the overall condition of the animal. Orthogonal radiographs were taken in cranio-caudal and medio-lateral views to evaluate the fracture location and types.

Results and Discussion

In the present study, a total number of 1950 dogs were presented with a history of long bone

fracture to the small animal surgery unit, veterinary clinical complex, Veterinary College and Research Institute, Namakkal. The occurrence of fracture was common in the femur (38.7%), radius-ulna (26.1%), tibia-fibula (22.1%) and humerus (13.1%) (fig. 1). The present study indicates that fractures are more commonly observed in the hind limbs compared to the forelimbs. This aligns with findings from several other researchers, such as Harasen (2003) [6], Beale (2004) [3], and Elzomor *et al.* (2014) [4], who have also reported a higher incidence of femur fractures. This suggests that the abundance of muscle around the femur does not necessarily protect it from fractures, as Markel *et al.* (1994) [11] noted. The incidence of fracture (fig.2) was mainly due to automobile accidents (53%), followed by falls from heights (27%), fighting/hunting (14%) and others (6%). In automobile accidents, animals are often struck from behind, as their slower reaction times in the hindquarters may contribute to more injuries in the rear limbs. It is also possible that animals, anticipating the trauma, may attempt to flee, thus exposing their hind limbs to the brunt of the impact. Additionally, injuries to the rear portion of the animal are less likely to be life-threatening, which may explain why these animals are more often brought in for treatment (Harasen, 2003) [6]. The fractures were recorded in animals with ages ranging from 1 month to 14 years i.e., 0 - 6 months (57%), 6 - 12 months (24%), 1 - 5 years (13%) and more than 5 years (6%) (fig.3). Rao *et al.* (1999) [13] also observed that fractures are more common in younger animals. This could be because young dogs are more active and have not yet developed the ability to avoid hazards as effectively as older dogs (Kolata *et al.*, 1974) [9]. Additionally, the cortical bones of young dogs are thinner compared to those of adults, making them less able to withstand even minor trauma, which can lead to fractures (Aithal *et al.*, 1999) [1]

Table 1: Incidence of fracture of bone involved

Fracture bone	Percentage affected
Femur	755 (38.7%)
Radius/ulna	510 (26.1%)
Tibia/ulna	430 (22.1%)
humerus	255 (13.1%)

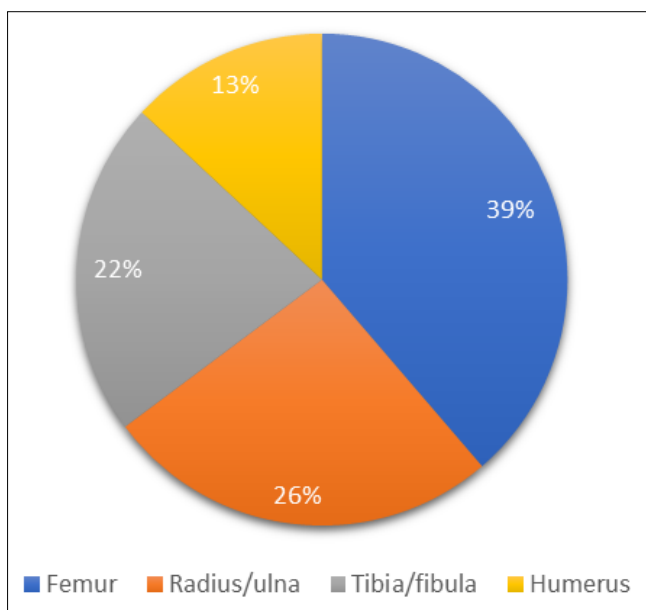


Fig 1: Incidence of fracture of bone involved

Table 2: Incidence of fracture according to history

Fractures history	Percentage affected
Automobile accidents	1034 (53%)
Fall from heights	526 (27%)
Fight / Hunting	273 (14%)
others	117 (6%)

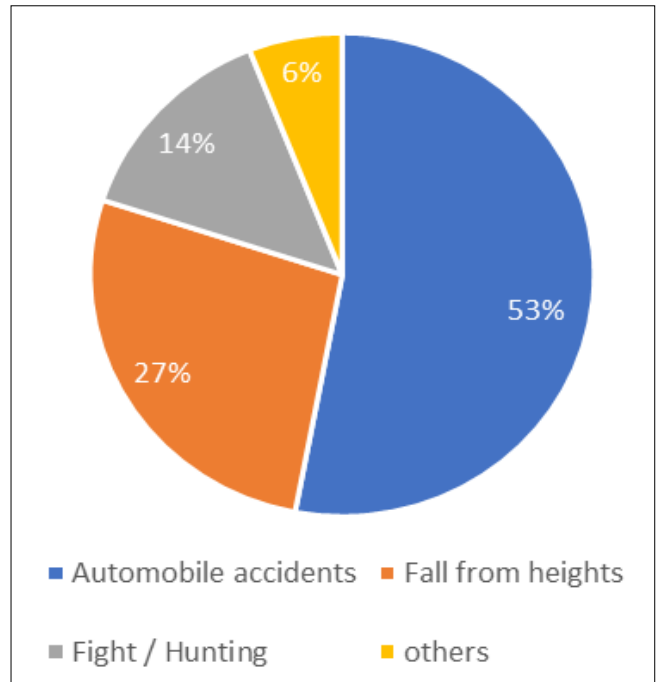


Fig 2: Incidence of fracture according to history

Table 3: Incidence of fracture according to age

Age of the dogs	Percentage affected
0 - 6 months	1112 (57%)
6 - 12 months	468 (24%)
1-5 years	253 (13%)
More than 5 years	117 (6%)

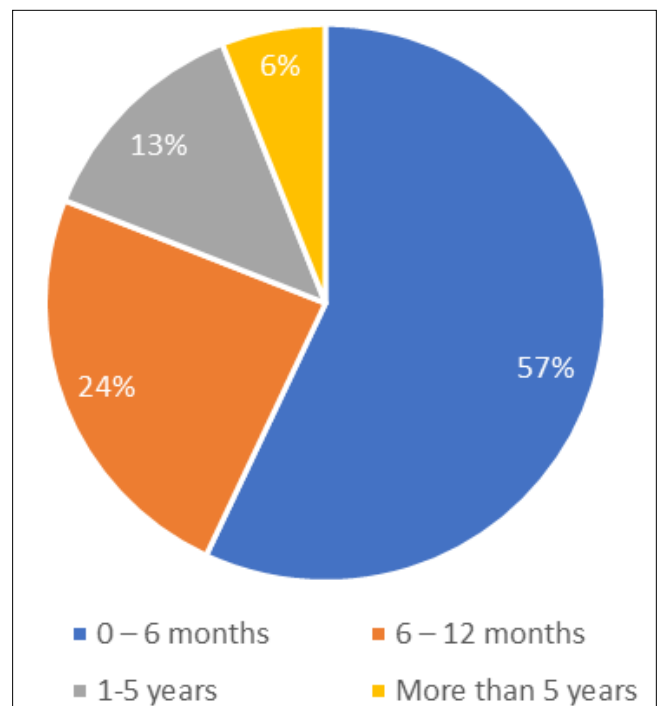


Fig 3: Incidence of fracture according to age

The present study found that male dogs (83.3%) are more likely to suffer fractures than female dogs (16.7%) (fig.4). Similar findings have been reported by Balagopalan *et al.* (1995) [2], Gahlod *et al.* (2002) [5], and Kumar *et al.* (2013) [10], who also noted a higher incidence of long bone fractures in males. This could be because male dogs tend to be more aggressive and are often more active, leading them to wander more than females, which increases their risk of fractures (Kolata *et al.*, 1974) [9]. Additionally, the higher number of male dogs in the population, as people tend to prefer male dogs over females, may also contribute to the greater incidence of fractures in males.

Table 4: Incidence of fracture according to sex

Sex of the animal	Percentage affected
Male	1625 (83.3%)
Female	325 (16.7%)

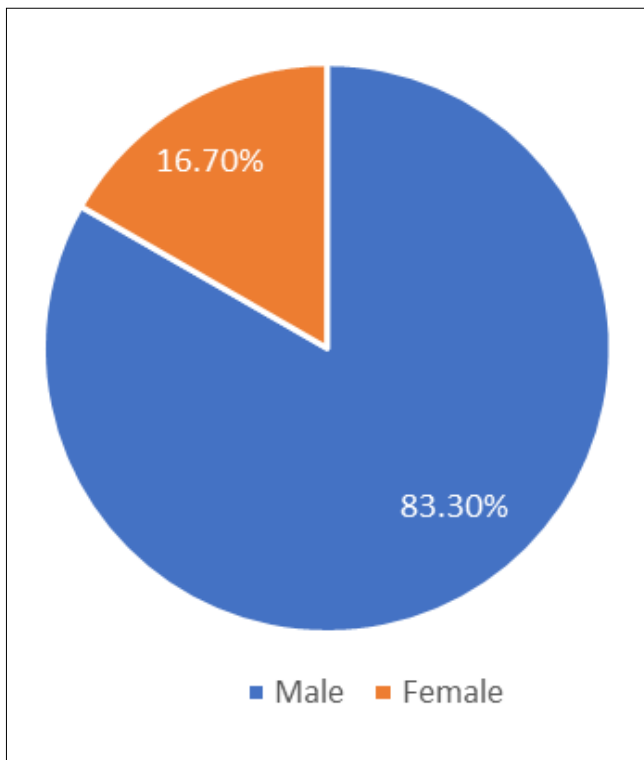


Fig 4: Incidence of fracture according to sex

The analysis of fractures based on type revealed that transverse and oblique fractures were the most frequent in long bones. Transverse fractures were the most common (62%), followed by oblique (18%), spiral (10%), multiple fragmented (6%) and comminuted (4%) (fig.5). Other studies have similarly reported a high occurrence of transverse fractures, followed by oblique and comminuted fractures (Sirin *et al.*, 2013; Rhangani, 2015) [15, 14]. The higher incidence of transverse and oblique fractures suggests that bending or compression forces are the predominant causes of these fractures (Smith, 1985) [16].

Table 5: Incidence of fracture according to type of fracture

Type of Fracture	Percentage affected
Transverse	1209 (62%)
Oblique	351 (18%)
Spiral	195 (10%)
Multiple	117 (6%)
Comminuted	78 (4%)

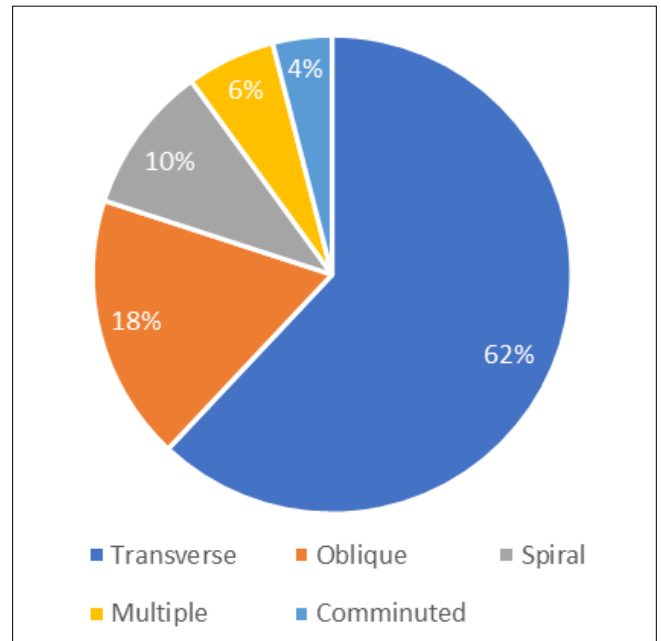


Fig 5: Incidence of fracture according to type of fracture

The breed-wise study revealed that the incidence of fracture was highest in the non-descript breed (49%) followed by Chippiparai (16%), Kombai (13%), Labrador (10%), Doberman (7%) and others (5%) (fig.6). In this study, the higher incidence observed in non-descript dogs could be attributed to their larger population and free-roaming nature, which increases their susceptibility to automobile accidents (Aithal *et al.*, 1999) [1]. In Tamil Nadu, Chippiparai and Kombai are mainly used for hunting and they end up with fractures while fighting.

Table 6: Percentage of Affected Dogs by Breed

Dog breed	Percentage affected
Non-descript	956 (49%)
Chippiparai	312 (16%)
Kombai	254 (13%)
Labrador	195 (10%)
Doberman	136 (7%)
others	97 (5%)

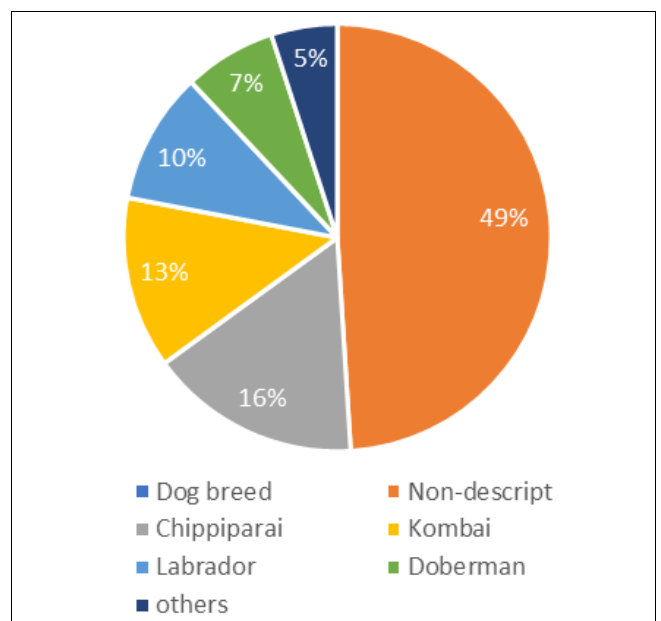


Fig 6: Distribution of Affected Dog Breeds by Percentage

Acknowledgement

Not available.

Author's Contribution

Not available.

Conflict of Interest

Not available.

Financial Support

Not available.

Conclusion

Fractures were more frequently observed in young animals under one year of age, with nondescript breeds being more commonly affected. Femur fractures were more prevalent compared to other bones, with the right side being more commonly involved. Males were affected more often, and the primary cause of fractures in dogs was automobile accidents.

References

1. Aithal HP, Singh GR, Bisht GS. Fractures in dogs: A survey of 402 cases. *Indian Journal of Veterinary Surgery*. 1999;20(1):15-21.
2. Balagopalan TP, Devanand CB, Rajankutty K, Amma TS, Nayar SR, Varkey CA, *et al.* Fracture in dogs - A review of 208 cases. *Indian Journal of Veterinary Surgery*. 1995;16(1):41-43.
3. Beale B. Orthopaedic clinical techniques femur fracture repair. *Clinical Techniques in Small Animal Practice*. 2004;19(3):134-150.
4. Elzomor ST, Sheta EME, Farghali HA, Ashour AE. Prevalence of femoral fractures in dogs. *Egyptian Veterinary Medical Association*. 2014;74(2):269-278.
5. Gahlod BM, Dhakate MS, Patil SN, Gawande PS, Kamble MV. Retrospective study of fractures in canines - A report of 109 cases. *Indian Journal of Veterinary Surgery*. 2002;23(2):128-129.
6. Harasen G. Common long bone fracture in small animal practice - part 2. *The Canadian Veterinary Journal*. 2003;44(6):503-504.
7. Jain R, Shukla BP, Nema S, Shukla S, Chabra D, Karmore SK. Incidence of fracture in dogs: A retrospective study. *Veterinary Practitioner*. 2018;19(1):63-65.
8. Kallianpur N, Singh K, Gopinathan A, Sarangom SB, John C, Sowbharenaya C, *et al.* Investigation on the relation between factors affecting occurrence and outcome of repair of long bone fractures in 216 dogs. *International Journal of Livestock Research*. 2018;8(2):225-234.
9. Kolata RK, Kraut NH, Johnstone DE. Patterns of trauma in urban dogs and cats: A study of 1000 cases. *American Journal of Veterinary Medical Association*. 1974;164:499-502.
10. Kumar P, Aithal HP, Kinjavdeker P, Amarpal, Pawde AM, Pratap K, Bishen GS. The occurrence and pattern of simple and compound fracture of the limb bones in different domestic animals: A retrospective study of 986 cases. *Indian Journal of Veterinary Surgery*. 2013;34(1):35-40.
11. Markel MD, Sielman E, Rapoff AJ, Kohles SS. Mechanical properties of long bones in dogs. *American Journal of Veterinary Research*. 1994;55:1178-1183.
12. Rani UR, Vairavaswamy T, Kathiresan D. A

retrospective study on bone fractures in canines. *Indian Veterinary Journal*. 2007;81:1048-1050.

13. Rao MN, Ranganath I, Ranganath BN. Survey of fractures in dogs: A review of 5328 cases. *Intas Polivet*. 1999;2:179-182.
14. Rhangani R. Incidence, Classification and Management of appendicular bone fractures in dogs in Nairobi country, Kenya - A retrospective study. M.V.Sc. Thesis, University of Nairobi, Kenya; 2015.
15. Sirin OS, Kaya U, Olcay B. Clinical and radiological outcomes of locking compression plate system in dogs with diaphyseal fractures: 32 cases. *Kafkas Universitesi Veteriner Fakultesi Dergisi*. 2013;19:13-18.
16. Smith GK. Biomechanics pertaining to fracture etiology, reduction and fixation. In: Newton CD, Neunamaker DM, editors. *Textbook of Small Animal Orthopaedics*. Philadelphia: J. B. Lippincott; 1985. p. 195-230.

How to Cite This Article

Sriharsha GV, Kumaresan A, Kokila S, Arulmozhi A, Kathirvel S, Dharmaceelan S, *et al.* A retrospective study on the incidence of long bone fractures in dogs. *International Journal of Veterinary Sciences and Animal Husbandry*. 2024;9(5):800-803.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.