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Incidence of tibial fractures in dogs

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Abstract

The present study was carried out among the dogs presented to the Veterinary College Hospital, Hebbal, Bengaluru during a period of one. A total number of 49,600 animals were presented, out of which 39297 cases were dog cases. A total of 13,761 cases were presented to the Department of Veterinary Surgery and Radiology, Bangalore, among which 9959 were dog cases. Total 370 dogs were found to have fractures of various bones, among them 14.86 percent (55) had tibial fractures. Higher tibial fractures were seen in younger dogs within 0-6 months of age (n=16, 29.09%). The majority of the tibial fractures were recorded in male dogs 61.8 percent (34) and 38.18 percent (21) were female and major etiology being automobile accidents (55%), followed by falls from heights (43%) and other physical trauma (2%). Breed-wise studies showed that non-descript dogs were more affected.

Keywords: Tibia, fractures, incidence, etiology

1. Introduction

Fracture could be explained as the loss of continuity in bones with or without fragment displacement and is always accompanied by varied degrees of soft tissue injury, such as lacerated periosteum, contused nerves, ruptured arteries, and bruised muscles. Internal organs could also become traumatised, as well as skin that would be cut and it was always necessary to consider the stress to soft tissue, which was frequently more important than the fracture itself (Newton and Nunamaker, 1985) [14]. Long bone fractures in dogs were noted as one of the most frequent orthopaedic conditions. Since the tibia was a major weight-bearing bone, there was less muscle tissue covering it (Harasen, 2003) [7]

2. Materials and Methods

The present study was undertaken on six clinical cases of dogs with tibial fractures, irrespective of age, gender and breed presented to the Department of Veterinary Surgery and Radiology, Veterinary College, Hebbal, Bengaluru.

2.1 Study period

The study was conducted for a period of twelve months from January 2022 to December 2022.

2.2 Physical and Radiographic examination

Canines presented with hind limb lameness were examined initially for clinical signs of fracture. All the cases showed non-weight bearing lameness, the swelling was noticed at the fracture site, dangling of limb, clear crepitation and pain were felt on physical examination of the affected hind limb and plain radiographs ultimately confirmed the fracture. Radiographs of two views medio-lateral and antero-posterior provided information related to the type of fracture, site of the fracture.

3. Results and discussion

3.1 Occurrence of tibial fracture in dogs

During the study period of 12 months (January 2022 to December 2022) a total of 49,600 cases were presented to the Veterinary Clinical Complex (VCC), Veterinary college, Hebbal, out of which 39297 cases were dog cases, in which 13,761 cases were presented to the Department of Veterinary Surgery and Radiology, Hebbal, Bangalore among which 9959 were dog cases. Among them, 370 (3.71%) dogs were found to be having fractures of various bones and careful examination revealed that 55 were of tibial fractures with an overall occurrence of 14.86 percent (Table 1).

This is in correlation with Philips (1979) [15] where they recorded 14.8 percent tibial fractures and Aithal *et al.* (1999) [1] recorded 17.16 percent of tibial fractures. This was also in consistency with Nagaraju (2009) [13] who reported (15%) tibial fractures among all other fractures. Similar reports were given by Kemper and Diamante (2010) [11] which accounted for 15-21 percent of all fractures. Soudi (2021) [18] recorded 25 percent incidence of canine tibial fractures. In her survey

Gracias (2022) [6] recorded 30 percent incidence of tibial fractures in canines which was slight greater value compared to our study. Kallianpur *et al.* (2018) [10] gave comparable results, representing 20.4 percent tibial fractures compared to our research, there was no substantial differences in the occurrence of tibial fractures identified by different authors, although minor differences could be found due to variations in the study period and geographical location.

Table 1: Occurrence of tibial fractures in dogs

Total number of cases presented to the department of VSR during the study period	Total number of fractures in dogs in the study period	Total number of tibial fractures
9959	370 (3.71%)	55 (0.55%)

3.2 Breed-wise occurrence of tibial fractures

Breed-wise, non-descript (n=17, 30.9%) dogs were found to be more affected compared to other breeds. The occurrence of tibial fractures in other breeds were as follows, Labrador Retriever (n=9, 16.3%), Golden Retriever (n=5, 9.09%), Beagle (n=3, 5.4%), Boxer (n=3, 5.4%), Siberian Husky (n=3, 5.4%), Pomeranian (3, 5.4%), Rottweilers (n= 3, 5.4%), Shih-Tzu (3, 5.4%), Dachshund (n=2, 3.6%), Dalmatian (n=2, 3.6%) and German Shepherd (n=2, 3.6%), (Table 2). Breed-wise, nondescript (30.9%) dogs were found to be more affected compared to other breeds followed by Labrador (16.3%), This might be due to semi domestic type of domestication in these non- descript breeds of dogs, where dogs were particularly likely to get into external trauma. This was in correlation with Nagaraju (2009) [13], in their studies they noted (30.61%) of affected dogs were non-descript type. similar observations were made by Dilip (2007) [4], Simon *et al.* (2010) [17], Jain *et al.* (2018) [9] and Soudi (2021) [18].

Table 2: Breed wise occurrence of tibial fractures in dogs in the study period

Breeds	Number of dogs with tibia Fracture	Percent (%)
Non-descript	17	30.9
Labrador Retriever	9	16.3
Golden Retriever	5	9.09
Beagle	3	5.4
Boxer	3	5.4
Siberian Husky	3	5.4
Pomeranian	3	5.4
Rottweiler	3	5.4
Shih-Tzu	3	5.4
Dachshund	2	3.6
Dalmatian	2	3.6
German Shepherd	2	3.6

3.3 Age wise occurrence of tibial fractures in dogs

During the period of study, young dogs were found to be more susceptible for tibial fractures. Highest occurrence recorded in dogs; within 0-6 months' age (n=16, 29.09%), followed by age group 6 to 12 months (n=14, 25.45%), 12-18 months (n= 5, 9.09%), 18-24 months (n=5, 9.09%), 24-36 months (n=5, 9.09%) age group. Dogs of age 3-4 years (n=3, 5.45%), 4-6 years (n=3, 5.45%) and dogs more than 6 years (n=4, 7.27%) were recorded during the study period of 12 months (Table 3). This could be attributed to the increased activity in younger dogs and increased vehicular traffic and also less bone density. Similar findings were reported by Simon *et al.* (2010) [17] and Soudi (2021) [18] who recorded that the incidence of fractures was highest in young animals less than six months of age. Aithal *et al.* (1999) [1] said immature

dogs (56.65%) (less than 1 year) suffered more than adults which could be due to more dynamic behavior and were not learnt to face dangers, unlike adults. Minar *et al.* (2013) [12] inferred that younger dogs were more susceptible to tibial fracture because of less bone density in growing age and could suffer from fracture even when exposed to small trauma. Aronsohn and Burk (2009) recorded 50% of the dogs and cats were below one year of age. Results were also in agreement with El-shafey *et al.* (2022) where young animals less than one year and male animals were more commonly affected and accounted for 67.07 percent.

Table 3: Age-wise occurrence of tibial fractures in dogs

Age	Number of dogs
0-6 months	16 (29.09%)
6-12 months	14 (25.45%)
12-18 months	5 (9.09%)
18-24 months	5 (9.09%)
24-36 months	5(9.09%)
3-4 years	3 (5.45%)
4-6 years	3 (5.45%)
Above 6 years	4 (7.27%)
Total	55

3.4 Sex-wise occurrence of tibial fractures in dogs

Among the 55 tibial fracture cases, thirty-four (61.8%) were male and twenty one (38.18%) were female (Table 4). This could be attributed to the higher male dog population in comparison to females, as well as males' proclivity to be more aggressive and territorial, causing them to chase down vehicles and increase the number of road accidents. This was in correlation with Aithal *et al.* (1999) [1], Minar *et al.* (2013) [12], Soudi (2021) [18] and Gracias (2022) [6].

Table 4: Sex-wise occurrence of tibial fracture in dogs

Sex	Number of dogs with tibial fracture
Male	34 (61.8%)
Female	21 (38.18%)
Total	55

3.5 Etiology of tibial fractures

The majority of tibial fractures in dogs were caused by automobile accidents (55%), followed by falls from heights (43%) and other physical trauma (2%) (Table 5). This was in correlation with the documentation by Philips (1979) [15], who found that road injuries were the main cause of fractures. Boone *et al.* (1986) [3] and Rani *et al.* (2004) [16] also stated that tibial fractures were typically caused by road collisions. Similar results were found by Minar *et al.* (2013) [12], most fracture had occurred mostly due to traffic accident (76.9%),

followed by falling down, (12.8%) trauma and stuck in door. Hayashi (2018) [8] observed that tibial fractures often resulted from trauma. Soudi (2021) [18] recorded that 69.30 percent of fracture cases were met with road accidents. The metropolitan setup and increase in vehicular density in Bangalore might be correlated with greater frequency of automobile accidents. Moreover, most of the non-descript dogs were semi-domesticated where they freely move around in search of food and mate and had high probability of automobile accidents.

Table 5: Etiology of tibial fracture in dogs

Aetiology	Automobile accidents	Fall from height	Other physical trauma
Number of animals	31	23	01

4 Conclusion

In the present study tibial fractures accounted to 21% of occurrence among various bone fractures. The occurrence of fractures was most commonly seen in younger age groups of dogs and tibial fractures were more common in male animals compared to female. The majority of the fractures were caused by automobile accidents.

5 References

- Aithal HP, Singh GR, Bisht GS. Fractures in dogs. A survey of 402 cases. *Indian J Vet. Surg.* 1999;20(1):15-21.
- Aronsohn MG, Burk RL. Unilateral uniplanar external skeletal fixation for isolated diaphyseal tibial fractures in skeletally immature dogs. *Vet. Surg.* 2009;38(5):654-658.
- Boone EG, Johnson AL, Hohn RB. Distal tibial fractures in dogs and cats. *J Am. Vet. Med. Assoc.* 1986;188(1):36-40.
- Dilip PG. Comparison of type Ia and Ib external skeletal fixation for tibial fracture repair in dogs. M.V.Sc. thesis, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, India; c2007.
- El-shafey S, El-Mezyen AEM, Behery A, Abd El Raouf M. Tibial and fibular fractures in dogs and cats: Retrospective study. 2022. *Zagazig Vet. J.* 2022;50(1):52-61.
- Gracias RM. Comparative evaluation of intramedullary pinning and modified intramedullary interlocking nailing techniques for the repair of tibial fractures under fentanyl-ketamine induction and isoflurane maintenance in dogs. M.V.Sc. thesis, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, India; c2022.
- Harasen G. Common long bone fractures in Small Animal Practice Part-1, *Can. Vet. J.* 2003;44(4):333-334.
- Hayashi K. Tibia Fractures. In: *Locking Plates in Veterinary Orthopedics*. Edt. Matthew, D. Barnhart and Karl, C. Maritalo. Edn. 1st, John Wiley and son's publication; c2018. p. 129-139.
- Jain R, Shukla BP, Nema S, Shukla S, Chabra D, Karmore SK. Incidence of fracture in dog: A retrospective study. *Vet. Pract.* 2018;19(1):63-65.
- Kallianpur N, Singh K, Gopinathan A, Sarangom SB, John C, Chelladuraai S. Investigation on relation between factors affecting occurrence and outcome of repair of long bone fractures in 216 dogs. *Int. J Livest. Res.* 2018;8(2):225-234.
- Kemper B, Diamante GAC. Retrospective study on fractures in felines attended in the veterinary Hospital at Marília University, São Paulo, Brazil, from 2007 to 2014. *Ciênc. Biol. Saúde.* 2010;12(2):23-26.
- Minar M, Hwang Y, Park M, Kim S, Oh C, Choi S, *et al.* Retrospective study on fractures in dogs. *J. Biomed. Res.* 2013;14(3):140-144.
- Nagaraju N. Comparison of stainless steel versus acrylic connecting bar for type Ib external skeletal fixation for tibial fracture repair in dogs. M.V.Sc. thesis, Karnataka Veterinary Animal and Fisheries Sciences University, Bidar, Karnataka, India; c2009.
- Newton CD, Nunamaker DM. Etiology, classification, and diagnosis of fractures. In: *Textbook of small animal orthopedics*. Edn. 43rd, Lippincott Williams and Wilkins; c1985. p. 415-443.
- Phillips IR. A survey of bone fractures in the dog and cat. *J Sm. Anim. Pract.* 1979;20:661-674.
- Rani RU, Vairavaswamy T, Kathiresan D. A retrospective study on bone fractures in canines. *Indian Vet. J.* 2004;81:1048-1050.
- Simon SM, Ganesh R, Ayyappan S, Rao GD, Kumar SR, Kundave VR. Incidences of pelvic limb fractures in dogs: A survey of 478 cases. *Vet. World.* 2010;3(3):120-121.
- Soudi P. Studies on Percutaneous tibial fracture repair by intramedullary pinning in dogs. M.V.Sc. Thesis, Karnataka Veterinary Animal and Fisheries Science University, Bidar, Karnataka, India; c2021.