

Incidences of pelvic limb fractures in dogs: A survey of 478 cases

Shiju Simon, M., R. Ganesh, S. Ayyappan, G. D. Rao*, R. Suresh Kumar, V. R. Kundave and B. C. Das

Department of Veterinary Surgery and Radiology,
Madras Veterinary College,
Tamil Nadu Veterinary and Animal Sciences University, Chennai -7
* Corresponding author

Abstract

A survey was undertaken to analyse pelvic limb fractures in dogs reported to Radiology Unit of the Madras Veterinary College, from April 2007-May 2009. A total 478 cases of pelvic limb fractures were reviewed in this study. The incidence was highest in young animals (46.02 percent) less than six months of age. Majority of the fractures were recorded in non-descript dogs (47.48 percent). Male dogs were affected more (61.5 percent) than female dogs of all the age groups. Among the various bones of the pelvic limb the incidence was highest in femur (47.48 percent) followed by tibia and fibula (42.67 percent). The occurrence of oblique/transverse fractures were more (44.8 percent) than comminuted (26.8 percent) and avulsion fractures (7.53 percent).

Keywords: Incidence, Pelvic Limb, Fracture, Femur, Tibia

Introduction

Fracture of the long bone is a commonly encountered orthopaedic problem in canine practice. Understanding the different types of fracture and their incidence will be helpful to develop improved techniques of fracture fixation in dogs (Aithal et al., 1999). Pelvic limb fractures are due to high energy trauma and can result in both life threatening injuries, severe and permanent disability (Kolata et al., 1974). This retrospective study was undertaken to analyse the pelvic limb fractures in dogs.

Materials and Methods

A review of clinical cases of pelvic limb fracture recorded in the Radiology Unit of Madras Veterinary College, from April 2007-May 2009 was reported in this study. 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 of 478 cases of pelvic fractures were recorded during the period of this study. The results of the present study showed that the pelvic limb fractures were more common in non-descript dogs (47.48 %) followed by spitz (20.08 %), Alsatian (7.11%), Labrador (5.85%), Doberman Pinscher (4.81%), Great Dane (3.34%), Pomeranian (2.92%), Boxer (2.09%), Pug

(1.88 %), Dachshund (1.25%), Dalmatian (1.04 %) and others (2 %). The highest incidence of the pelvic limb fracture in non-descript dogs observed in the present study might be due to their free roaming habit which make them more vulnerable to road accident (Maala and Celso, 1975).

Young dogs below six months were most commonly affected (46.02%). This could be due to their active, playful and are not accustomed to cope with the risks of environment (Kolata et al., 1974). Young dogs gets skeletal maturity between 5 months (toy breeds) and 18 months (giant breeds) through a very rapid, biphasic growth rate. During the initial growth phase, both structural and material properties of immature bone are considerably different from those of adult bone and are characterized by lower strength, and stiffness, as well as lower yield stress and elastic modulus (Torzilli, 1981). Male dogs were affected more (61.50 percent) than female dogs in all the age groups. Aggressive nature and wandering habits of the male dogs make them more prone to accidents and fractures (Kolata et al., 1974)

Bone wise distribution of fractures of the pelvic limbs revealed that the incidence was highest in femur (47.48 %) followed by tibia and fibula (42.67 %), pelvis (5.02 %) and others (4.81%). These findings are in accordance with that of Balagopalan et al., (1995). Whereas Johnson et al., (1998) reported femur

fractures 35 per cent of hind limb fractures and 24 per cent of all fractures in dogs. It is opined that presence of thick muscular covering does not protect the femur from getting fractured Aithal et al., (1999).

Pelvic limb fractures were more common in right side (53.44%) than left side (46.56%).

Femoral fractures were recorded in 227 cases. Left femur fractures were more (51.54%) than right femur and more frequent in shaft (44.05%) followed by distal (33.92%) and proximal (22.02%), similar finding were reported by Singh et al., (1983). The incidence of diaphyseal femur fractures is about 20-25%, which is the highest for long bone fractures in the body (Wong, 1984). Aithal et al., (1999) reported that distal half of the femur is away from the long axis of the pelvic limb which makes it more susceptible to bending forces and leads to fracture. Compared to humans, animals more commonly fracture the major bones closest to the body, the femur in the hind limb and the humerus in the front limb.

Tibia and fibula, fractures were recorded in 204 cases. Fractures of the tibia were common in the proximal (68.5 %), middle third (32.4 percent and distal (19.01 percent). Right side tibial fracture was more than left side. Piermattei and Brinker (1997) recorded that tibia/fibula fractures comprised of 21% of long bone and 11.7% of total limb fractures. Proximal tibial fracture is very common and comprises of 7% of tibial fractures.

Among the different types of fractures of the pelvic limb, oblique/ transverse (44.8%), comminuted (26.8%) and avulsion fractures (7.53 %) were common. Which was also reported by Balagopalan et al., (1995). Avulsion fracture occurs when a bone breaks and a fragment of the bone is separated by the pull of an

attaching muscle, tendon or ligament. Avulsion fracture occurs in younger dogs, before the area of the tibia has fully grown and fused to the rest of the bone. Higher incidence of oblique/transverse fracture indicate that the predominance of bending or compression forces as the cause of fracture (Smith, 1985).

References

1. Aithal, H. P., Singh, G. R and Bisht, G. S. (1999): *Indian J. Vet. Surg.*, 20(1): 15-21.
2. Balagopalan, T. P., Devanand, C. B., Rajankutti, K., Saradamma, T., Nayar, S. R., Varkey, C. A., Jalaludin, A. M., Nayar, K. N. M and George, P. O. (1995): *Indian J. Vet. Surg.*, 16(1): 41-43.
3. Johnson, L., C.W. Smith., J. David and Schaffer, (1998): Fragment reconstruction and bone plate fixation versus bridging plate fixation for treating highly comminuted femoral fracture in dogs. *J. Am. Vet. Med. Assoc.*, 213: 1157 – 1161.
4. Kolata, R. T., Kraut, N. H and Jonshon, D. E. (1974): *J. Am. Vet. Med. Assoc.*, 164:499-502.
5. Maala, C. P and Celo, E. M. (1975): *Phillipine J. Vet. Med.*, 14:137-143.
6. Piermattei, D. L and Brinker. (1997): *Handbook of Small Animal Orthopedics and Fracture Repair*. WB Saunders Company, Philadelphia, 586-594.
7. Singh, a. P., Mirakhur, K. K and Nigam, J. M. (1983): *Indian J. Vet. Surg.*, 4: 61-66.
8. Smith, G. K., (1985): Biomechanics pertinent to fracture etiology, reduction and fixation. In: *Textbook of Small Animal Orthopaedics*. Eds: Newton, C. D and Neunamaker, D. M. J. B. Lippincott, Philadelphia, pp. 195-230.
9. Torzilli, P. A., Takebe, K and Burstein, A. H. (1981): Structural properties of immature canine bone. *J Biomech Eng*; 103:232–238.
10. Wong, W. T., (1984): A survey of fractures in the dog and cat in Malaysia. *Vet Rec*. 115: 273-274.

* * * * *