PREVALENCE OF FEMORAL FRACTURES IN DOGS AND CATS

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SUMMARY

The orthopedic hind limb affections in dogs constituted 31.99% of the admitted cases to the Surgery clinic, Faculty of Vet. Med. Cairo univ., while the corresponding percentage in cats was 11.70% during the period from October 2010 to April 2013. Pelvic limb fractures accounted for 50.60% of the orthopedic dog patients, whereas, pelvic limb fracture in cats represented 69.39%. Femoral fracture in dogs constituted 56.80% of pelvic limb fractures, whereas, femoral fracture in cats comprised 59.80%. The highest proportion in femoral fracture in dogs was in midshaft fracture (46.10%), while in cats was the supracondylar fracture (57.41%).

INTRODUCTION

Orthopedic affections constituted a major problem among dogs and cats (Senna, 2001; Harari, 2002 and Ben Ali, 2013). The most common type of fractured long bones in dogs and cats was the femur and tibia (Harasen, 2003). Femoral fractures were traumatic in origin due to automobile accidents and occasionally pathologic as a result of primary or metastatic bone tumors (Ozsoy and Altunatmaz, 2005). Femur fractures represented 45% of all long-bone fractures, a rate which was more than double that of other bones (Unger, Montavon and Heim, 1990 and Brinker, Piermattei and Flo’s, 2006). The percentage of femur fracture was 29.94%. Distribution of femur fractures according to anatomic regions were diaphyseal (73.21%), supracondylar (19.64%), caput femoris (3.57%), trochanter major (1.78%) and collumn femoris (1.78%) as reported by Tercanlioglu and Sarierler (2009). The majority of femoral fractures (69%) occurred at or below two years old (Kolata and Johnston, 1975; Braden, Eicker, Abdinoor and Prieur, 1994). The most common breeds of cats affected with bone disorders were Siamese, Egyptian Mau and
Short-hair cats (Senna, Gadallah and Zabady, 2004). Various reconstructive methods had been recommended for repair of femoral fractures that included intramedullary pins (Hulse and Aron, 1994), Interlocking nails (Muir and Johnson, 1996), Intramedullary pins combined with external skeletal fixation (Aron, Foutz, Keller and Brown, 1991; Gadallah, Farghali and Magdy, 2009), intramedullary pins combined with cerclage wiring (Howard, 1991), external skeletal fixation alone (Carmicha et al., 1997 and Farag, Shamaa and Gadallah, 2001), buttress bone plates (Aron, Johnson and Palmar, 1995) and cortical bone allograft (Gadallah, 1998) and xenografts (El-Keiey, GadAllah and Amer, 2010).

**MATERIAL AND METHODS**

A Survey study was performed on 2000 pet animals that encompassed 772 dogs and 1228 cats. Out of these animals, 394 cases (247 dogs and 147 cats), of both genders and aged from 1.5 month to 10 years in dogs and 2 months to 12 years in cats, had orthopedic hind limbs problems. The present study was conducted on 227 cases suffering from fracture (125 dogs and 102 cats). Femoral fractures were diagnosed in 132 animals (71 dogs and 61 cats). The cases were collected at the Surgery Clinic of the Faculty of Veterinary Medicine, Cairo University and some private clinics in Cairo, during the period from October 2010 to April 2013. All cases were exposed to thorough clinical examination that based upon case history, physical and clinical examination included inspection, gait evaluation, neurologic and radiographic examination. Radiological examination involved imaging the pelvis and femur, using an exposure of 45 - 65 KVP with fixed 10 MAS and 80 cm focal film distance depended on the animal size. Two projections perpendicular to each other were taken. Sedation of the affected animals with 1 mg/kg body weight xylazine HCL (Xyla-Ject 2%, Adwia, Egyptian Company for Chemicals and Pharmaceuticals) was injected when needed.

**RESULTS**

The admitted cases in dogs (38.6 %) were less than that of cats (61.4%) in relation to the admitted population. The orthopedic dog patients (31.99 %) were more than that in cats (11.70 %) in respect to the population of each compared to its admitted cases (Table1). The total number of the pelvic limb fracture in dogs (50.60 %) from the total pelvic limb
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Orthopedic affections was lesser than that of cat (69.39%). The femoral fractures in dogs (56.80%) from the total canine pelvic limb fractures were lesser than that in cats (59.8%). Distribution of the canine and feline femoral fracture according to the anatomical relations was illustrated in (Table 2). The percentages of all types of femoral fractures in dogs were more than that in cats except supracondylar fracture in cats (57.4%) compared to dogs (21.10%) and intercondylar fracture in cats (3.3%) which were not represented in dogs. Midshaft femoral fracture in dogs (45.10%) was more than that in cats (19.70%) and subtrochanteric fracture in dogs (1.4%) was not represented in cats. The highest incidence recorded among feline femoral fractures was supracondylar (59.32%).

Table (1): The percentage of hind limb orthopedic affections in relation to the total admitted cases.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of admitted cases</th>
<th>percentage in relation to all cases</th>
<th>percentage in relation to orthopedic cases</th>
<th>percentages in relation to hind limb fracture cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog</td>
<td>772 (38.64%)</td>
<td>247 (31.99%)</td>
<td>125 (50.60%)</td>
<td>71 (56.80%)</td>
</tr>
<tr>
<td>Cat</td>
<td>1228 (61.4%)</td>
<td>147 (11.97%)</td>
<td>102 (69.39%)</td>
<td>61 (59.80%)</td>
</tr>
<tr>
<td>Total</td>
<td>2000</td>
<td>394</td>
<td>227</td>
<td>132</td>
</tr>
</tbody>
</table>

The recorded cases of proximal extremity fracture in dogs constituted femoral head fracture (Fig.1), femoral neck fracture (Fig.2), slipped capital epiphysis (Fig.3) which represented 2.8%, 7% and 9.9% respectively. The recorded cases of proximal extremity fracture in cats constituted femoral head fracture (Fig.4), femoral neck fracture (Fig.5), slipped capital epiphysis which represented 1.6%, 6.6% and 1.6% respectively. Diaphyseal fracture in dogs constituted sub-trochanteric femoral fracture (1.4%), proximal shaft fractures (12.7%), and mid-shaft fractures (45.1%). Diaphyseal fracture in cats was represented by proximal femoral fractures (9.8%) (Fig.6) and mid-shaft fractures 19.7% (Fig.7).

The distal extremity fracture in dogs constituted only supracondylar fracture (21.1%). The distal extremity fracture in cats constituted supracondylar (59.32%) (Fig.8) and...
intercondylar (3.3 %) fractures. The highest incidence was recorded among feline supracondylar 59.32 % and among dogs was the midshaft 45.1% fractures.

Table (2): The percentage of femoral fractures in dogs and cats.

<table>
<thead>
<tr>
<th>Fracture site</th>
<th>Species</th>
<th>Proximal epiphysis</th>
<th>Diaphysis</th>
<th>Distal epiphysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Femoral head fracture</td>
<td>Femoral neck fracture</td>
<td>Slipped femoral capital epiphyses</td>
</tr>
<tr>
<td>Dog</td>
<td></td>
<td>2 (2.8%)</td>
<td>5 (7%)</td>
<td>7 (9.9%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 (19.7 %)</td>
<td>42 (60.2 %)</td>
<td>15 (21.1%)</td>
</tr>
<tr>
<td>Cat</td>
<td></td>
<td>1 (1.6%)</td>
<td>4 (6.6%)</td>
<td>1 (1.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 (9.8 %)</td>
<td>18 (29.5 %)</td>
<td>37 (60.7%)</td>
</tr>
</tbody>
</table>
Fig. (1): Ventrodorsal radiograph of a 2-years-old male Griffon dog showed intra-articular femoral head fracture (white arrow).

Fig. (2): (A&B): Ventrodorsal radiograph of a 18-month-old male Pekingese dogs showed left femoral neck fracture.

Fig. (3): Ventrodorsal radiograph of pelvis of a six-months-old male Rottweiler showing epiphysiolysis.

Fig. (4): Lateral and ventrodorsal radiographs of pelvis of a 8 months old male Persian cat showing fracture luxation of the coxofemoral joint with a large portion of the femoral head remained within the acetabulum (arrow).
Fig. (5): Left AP and right Lateral radiographs of a 9-months-old female cat showed old left femoral neck fracture “Note loss of normal opacity as result of interference of blood supply”.

Fig. (6): Lateral and Ventrodorsal radiographs of the pelvis of a 14 years old male Siamese cat showing oblique proximal femoral fracture.

Fig. (7): Lateral radiograph of a 9-months old male Baladi cat showing transverse, mid shaft, right femoral fracture.

Fig. (8): Ventrodorsal and Lateral radiographs of a 18 months old male Persian cat showing a comminuted fracture involved the distal extremity of the femur leading to supra and inter-condylar fracture.
The orthopedic hind limb cases of the dogs represented 31.99 % of all presented dog patients, while that in cats represented only 11.97% which indicated that, the orthopedic patients presented at Surgery clinic, Faculty of Vet. Med. Cairo Univ., were more in dogs than in cats. Although the population of orthopedic patients in cats was less than that in dogs, the pelvic limb fractures (69.39 %) and femoral fractures (59.8 %) percentages in cats were more than, the corresponding percentages in dogs (50.6 % and 56.8 %). This might be indicated that most of the orthopedic problems in cats were fractures. In this respect, Ben Ali (2013) documented that, fracture cases represented 67 % in dogs and 23% in cats. Canine and feline femoral fractures recorded the highest percentage of hind limb fracture represented 56.6 % and 59.8 % respectively, a result which were mealy similar to that reported by Shiju Simon et al (2010), who documented that, femoral fractures comprised 47.48 % from the pelvic limb fractures in dogs. However, Ben Ali (2013) reported that, femoral fracture in dogs and cats represented by 37.5% and 25% respectively from the fracture cases. Moreover, Tercanliogu and Sarierler (2009) emphasized that, femoral fracture in dogs comprised 29.94 % of all fractures. Fracture of the proximal extremity comprised 19.7% in dogs and 9.8 % in cats. However, Leonard (1971) mentioned that, head and neck fracture constituted 6.8 % of all fractures, whereas, Tercanlioglu and Sarrierler (2009) mentioned that, head and neck fractures constituted 5.35 %. Slipped capital fracture 9.9 % in dogs constituted the major proximal epiphyseal fracture while in cats it represented only 1.6%. In this respect Leonard (1971) emphasized that, the incidence of epiphyseal separation was more than the proportion of neck fracture in dogs. The recorded subtrochanteric femoral fracture in dogs constituted 1.4 % of femoral fracture, a result which was approximately similar to those reported by Tercanlioglu and Sarrierler (2009) who mentioned that, it represented 1.78 %. Diaphyseal fractures accounted for 60.2 % in dogs and 29.5% in cats. However, Tercanlioglu and Sarrierler (2009) recorded that, diaphyseal fracture in dogs represented by 73.21% from femoral fractures, whereas, Leonard, (1971) mentioned that, diaphyseal fractures in dogs and cats accounted for more than 20 % of femoral fracture. On the other hand, Ben Ali, (2013) mentioned that, diaphyseal and supracondylar fractures were the most affected site of the femure in dogs and cats. Proximal shaft fractures in dogs constituted 12.7% while in cats it
constituted 9.8 %, a result which accept that mentioned by Leonard (1971) who stated that, the proximal segment constituted the smallest proportion of the diaphyseal fracture. Midshaft fracture in dogs constituted the highest proportion (46.1 %) of femoral fracture while in cats it formed only (19.7 %), however, Leonard (1971) mentioned that, midshaft fracture constituted 50% of femoral fracture in dogs and cats. As regards the distal epiphyseal fracture, supracondylar fracture represented by 21.1% in dogs, However it was emphasized that, the distal end fracture constituted 25% of femoral fracture in dogs (Leonard, 1971), and 19.64 % in dogs (Tercanlioglu and Sarierler, 2009) and 18.2-25.7% in dogs and cats (Sigen and Fjeld, 1986 and Stein, 1990). In the other hand supracondylar fracture in cats accounted the highest percentage (57.4 %) in addition to intercondylar fracture (3.3 %). This contradicts the reported percentage mentioned by Stigen and Fjeld, 1986 and Stein (1990).

CONCLUSION

The population of orthopedic patients in dogs was more than that in cats. The percentage of pelvic limb fracture and fracture femur were more in cats than in dogs. The majority of femoral fracture was in midshaft fracture in dogs and supracondylar fracture in cats.

REFERENCES


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