ORTHOPAEDIC PROBLEMS IN CATS
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INTRODUCTION
The teaching and training of small animal orthopaedic science in veterinary schools has been traditionally dominated by conditions seen in the canine patient. This despite the increasing popularity of the cat as a pet; in fact the cat pet population now exceeds the dog population in the UK. Why have cats received so little clinical attention? The most acceptable reason is the apparent low number of cats presenting with orthopaedic disease. In a survey of all orthopaedic conditions dealt with by a cross-section of practices in UK, cat cases only accounted for 20% of the total, despite the high cat population. Analysis of this group of cats further revealed that over half of the cases described as orthopaedic were animals lame as a result of cellulitis or abscessation following cat bites. Therefore less than 10% of the total cases described were what we would recognise as classical orthopaedic problems. In this group the majority of animals had conditions produced as a direct result of trauma with a very small proportion of orthopaedic disease.

A survey of all feline orthopaedic cases seen at 2 referral centres by the author over a 4 year period yielded 248 conditions. These were all true orthopaedic conditions with bite wounds excluded. The breakdown of these cases concurred with other similar surveys with the majority of conditions (89%) being traumatic in origin, with 163 fracture cases (66%) and 57 dislocations (23%) and less than 11% being classed as orthopaedic disease (Table 1). It is clear from these surveys why current orthopaedic expertise in cats is mainly the management of traumatically induced conditions. But is the approach to management identical to the dog or are there important species differences which should separate the cat from the small dog?

FRACTURE MANAGEMENT IN THE CAT
Fracture management in cats is based on decision making processes similar to those used in the dog. Factors which are important in cats include low body weight; low soft tissue morbidity and the inevitability of early mobility. Technical problems are provided by the small bones and the difficulty of maintaining external supports on certain cats.

LONG BONE FRACTURES
Long bone fractures are the most commonly encountered problem with all of the long bones being involved, although the femur and tibia seem particularly prone to injury. Intramedullary pins have been used with success in both the femur and tibia in addition to the humerus and ulna. The long bones of the cat are straight and concentric which makes them ideal for IM stabilisation. However failures due to early loosening and migration of pins are not uncommon. These failures can often be blamed on inappropriate implant selection and a disregard for some of the problems posed by an individual fracture in addition to overconfidence in the ability of a single IM pin. An awareness of the limitations of this implant and consideration of other simple implant systems can reduce the complication rate dramatically. Other considerations include the occurrence of multiple fractures and cost which seems a greater issue when considering fracture surgery than with dogs.

The external skeletal fixator is widely available, economical to use and when used alone or in combination with IM devices, can produce improved outcomes in many long bone fractures. One of the main problems of using the ESF in a cat is that it must be confined indoors while the fixator remains in place. Interlocking Nails can also be used to good effect in long bone fractures and can be used as an alternative in certain fractures and when a protruding implant is undesirable. Bone plates can provide a solution to some fracture problems with special cuttable plates being useful in fresh fractures and non-unions.

To generalise, simple IM pins can be used successfully in many straightforward diaphyseal fractures especially in the upper limb. Combining IM pins with an ESF enables this uncomplicated method of fixation to be applied in a greater range of simple and comminuted fractures to great effect especially in the upper limb. The ESF, used as a sole implant system, is best employed in distal limb fractures involving the tibia, radius and ulna.

EPIPHYSEAL SEPARATIONS
Epiphyseal separations and fractures involve the proximal and distal femur most commonly in the cat. Proximal femoral epiphyseal separations are usually Salter Type 1 and can be difficult to identify. Good radiographs are essential and a VD frog-leg view is most useful. Early recognition can allow surgical replacement using multiple small K-wires. Late diagnosis precludes surgical reconstruction due to remodelling of the femoral neck and is best treated by FHE. One should also be aware of metaphyseal osteopathy of the cat which is a progressive resorbtive condition of bone resulting in secondary fracture of the femoral neck. Stabilisation should not be attempted and the femoral head should be removed.

Distal femoral epiphyseal fracture separations are easily dealt with provided they are recognised at an early stage. Surgical stabilisation is recommended and can be accomplished successfully by a wide range of techniques.

PELVIC FRACTURES
These comprise a significant proportion of fractures and in the cat commonly involve SI separation and ischial fracture. Whether most of these fractures justify surgical stabilisation is often a source of debate and personal choice, as affected animals can often make a speedy and full clinical recovery with cage rest. My personal criteria for considering surgical intervention is as follows

- Severe narrowing of the pelvic inlet which may result in obstipation or problems with parturition in breeding queens
- Severe neurogenic pain suggesting on-going trauma to sciatic n.
- Involvement of the coxofemoral joint
- The possibility of simple surgical stabilisation

Fracture-dislocations of the sacro-coccygeal joint are common findings in the cat and are often accompanied by paralysis of the tail and urinary incontinence. Prognosis for return of function is guarded making this an important condition when present.

DISLOCATIONS
Dislocations which occur with some regularity in cats mainly involve the hip and hock joints although dislocations of the shoulder, stifle and elbow can be seen (Table 1).

Dislocation of the hip is often seen in combination with other orthopaedic injuries, most commonly pelvic fractures. It is
difficult to maintain reduction without surgical stabilisation. The hip is often left dislocated but I believe that this results in poor clinical function and surgical methods should be employed. The simplest method of dealing with these successfully is by using a transarticular pin inserted through the femoral head to pass across the joint and penetrate the acetabulum. This is easy to insert, maintains reduction, and if inserted correctly will allow sufficient movement of the hip enabling the cat to use the leg immediately post-reduction. The pin is removed 2-4 weeks after insertion.

The other joint commonly dislocated in the cat is the tarsocrural joint often accompanied by fracture of one or both malleoli. There may also be substantial soft tissue damage and skin loss in some cases. My approach to these problems is to consider simple relocation of the malleolar fractures and collateral support using small K-wires and then using a transarticular Type 2 ESF to support and immobilise the joint in a functional angle. The ESF is removed at 4-8 weeks post-application depending on the efficiency of the healing process.

Other orthopaedic conditions seen in cats which do not directly involve trauma form a low percentage of the total number of cases seen. Rupture of the common calcaneal tendon can be seen post traumatically but can also be seen as a ‘spontaneous’ avulsion unilaterally or bilaterally in older obese cats. The aetiopathogenesis of this avulsion is unknown but it responds well to support using a trans-articular ESF with or without surgical reattachment of the tendon.

Table 1. List of Orthopaedic Referral cases over a 4 year period

<table>
<thead>
<tr>
<th>Condition</th>
<th>Total Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fractures</td>
<td>163</td>
<td>66%</td>
</tr>
<tr>
<td>Dislocations</td>
<td>57</td>
<td>23%</td>
</tr>
<tr>
<td>Other miscellaneous</td>
<td>28</td>
<td>11%</td>
</tr>
<tr>
<td>Patellar luxation</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Common calcaneal tendon</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>TM joint</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Carpal Hyperextension</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Metaphyseal Osteopathy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tumour in bone</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Salvage</td>
<td>4</td>
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</tr>
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REFERENCES