

SURGICAL MANAGEMENT OF SUPRACONDYLAR FEMUR FRACTURE IN DOGS

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Introduction

A fracture involving distal femoral physis constitutes about 25 percent of all femoral fractures in small animals (Piermattei *et al.*, 2006). These fractures may be supracondylar or intracondylar in mature dogs whereas epiphyseal fractures are seen in young animals. Most of the supracondylar fractures are transverse, although occasionally oblique fractures are also recorded (Bojrab, 1975). Arthrotomy of the stifle joint is necessary to expose the entire distal segment which is usually displaced caudally and mostly accompanied by hematoma. The objectives of the fracture treatment include anatomical reduction and rigid uninterrupted fixation so that the animal is free to move the stifle joint during the healing period. A number of methods have been described in the literature for repair of supracondylar fractures in dogs. These include intramedullary pins (Stigen, 1999), crossed K-wires (Dietrich *et al.*, 1986), rush pins, lag screws, fixation with plates including tibial head compression plate, dynamic compression plate, reconstruction plate and horn plate, plate/rod combination, interlocking nail, modified type I external skeletal fixator etc. (Aithal *et al.*, 1999; Piermattei *et al.*, 2006). The present report describes two cases of supracondylar femoral fracture in dogs and their management.

Case history and observations

Case 1: A 2-year-old male non-descript dog was presented with the history of car accident. The dog was unable to bear weight on the right hind leg. Physical

examination revealed presence of crepitus at distal femur. General examination revealed no abnormal vital signs or other lesions except non-weight bearing on the right hind limb.

Case 2: An 11-month-old male Labrador retriever was brought with the history of non-weight bearing lameness in right hind leg after sudden fall from height. Physical examination revealed presence of swelling and crepitation at distal aspect of the femur.

Radiographs obtained in both the cases revealed supracondylar femoral fracture (Fig. 1 & Fig. 2). It was decided to stabilize the fracture by cross intramedullary pinning for a perfect osteosynthesis.

Treatment

The animals were premedicated with atropine sulphate at a dose of 0.04 mg/kg body weight subcutaneously followed 10 minutes later by pentazocine hydrochloride at a dose of 1mg/kg and diazepam at a dose of 0.5 mg/kg given intravenously. General anesthesia was induced with 2.5% thiopentone sodium at a dose of 25 mg/kg body weight and maintained by intermittent administration of thiopentone. The animals were positioned in lateral recumbency and prepared for aseptic surgery. Skin incision was made on craniolateral aspect of the stifle joint extending from distal femur to proximal tibia. The fracture fragments were exposed and brought into apposition and cross intramedullary pinning was performed by passing two 2.5 mm k-wires. The first pin was passed from medial aspect of medial condyle directing it towards the lateral aspect of proximal fracture fragment. The second

pin was passed from the lateral aspect of the lateral condyle directing in the reverse direction to the first pin. The pins were pushed alternatively at such angles that both pins emerged out of the proximal fragment at or near the trochantric fossa of the femur (Fig. 1 & Fig. 2). The pins were then pulled from the proximal end so that their distal ends rest with the levels of condyles of the femur. Extra length of the pins emerging at the proximal end were cut with the pin cutter as close to the skin as possible. The joint capsule and subcutaneous tissue were sutured using 2-0 PGA in a simple continuous manner and skin was closed in a simple interrupted

manner using 2-0 nylon. In both the cases, post-operative radiographs were made in lateral position to evaluate the level of fracture reduction and correct placement of pins in both fragments of the bone. Anaesthetic recovery was uneventful. Tramadol at a dose of 1.2 mg/kg, IM was administered in both cases to provide post-operative analgesia for 3 days and antibiotic therapy (ceftriaxone at a dose of 20mg/kg, IM, BID) was instituted for 7 days. Wound was dressed with povidone iodine solution until recovery.



Fig 1: Pre-operative and post-operative radiographs showing Supracondylar fracture, cross pin fixation and fracture healing by day 45 before pin removal in case 1.



Fig 2: Pre-operative and post-operative radiographs showing Supracondylar fracture, cross pin fixation and fracture healing by day 45 before pin removal in case 2.

Results and Discussion

Cage rest and restricted activity was advised for 15 days in both cases. The skin sutures were removed on 10th postoperative day and the dogs made an uneventful

recovery. Post-operative follow-up revealed that the dogs started partial weight bearing on the affected limb by 2nd post operative day and full weight bearing by the 12th post operative day. Pins were removed on 45th

postoperative day in both cases after radiographic examination showed complete fracture union with smooth bridging callus (Fig. 1 & Fig. 2).

Using rush pins, crossed pins and IM pin as a sole technique is a routine method in simple distal femoral fractures in dogs. Intramedullary pins resist bending force but is very poor in countering the rotational force (Syam *et al.*, 2012). Crossed pins are significantly stronger than single IM pins (Sukhiani and Holmberg 1997). Crossed pins are indicated in cats and small dogs, and for simple transverse or short-oblique fractures in adult animals (Sukhiani and Holmberg 1997; Lidbetter and Glyde 2000). The treatment of supra-condylar fractures of femur by cross pin fixation through stifle provides more than one point fixation, increasing the stabilization of fracture fragments leading to early fracture union in comparison to single pin fixation (Aithal *et al.*, 1998). In the present case report, cross pinning provided good stability and avoided involvement of stifle joint leading to successful fracture repair. Animals recovered without any post-operative complications during the followup period of 6 months.

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