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## Management of bilateral supracondylar femoral fracture in a cat

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#### Abstract

One year old, domestic short hair male cat weighing two kg body weight was presented with the history of fall from height. There was absence of weight bearing and swelling on thigh region of both the hind limbs. Radiograph revealed bilateral complete short oblique supracondylar femoral fracture. Under general anaesthesia the fractures were stabilized by cross pinning with C-arm guidance. With utmost post-operative care, the cat recovered uneventfully.

**Keywords:** Cat, cross pinning, fracture, supracondylar

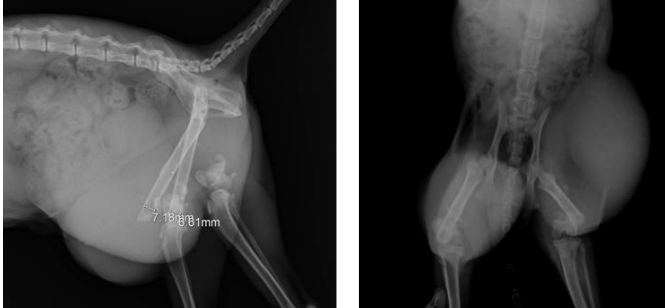
#### Introduction

Distal femoral fractures represent 20 to 25% of all femoral fractures in small animals and fractures involving distal femoral physis are common in young animals. The distal segment is usually displaced caudally with a sizable hematoma (Piermattei *et al.*, 2006) [1]. Generally supracondylar femoral fractures are simple, low metaphyseal fractures and Salter-Harris type I and II physeal injuries (Salter and Harris, 1963) [2]. Distal femoral physis accounts for 70% of femoral growth and 40% of overall limb length. Hence it is important to preserve distal femoral physis by different types of fixation techniques (Harasen, 2001) [3]. The major concerns for stabilization of supracondylar fractures are short length of distal segment, large medullary canal and caudal bow of the distal femur (Simpson and Lewis, 2003) [4]. Supracondylar fracture reduction and fixation can be remarkably challenging because of limited bone stock availability for fixation. External skeletal fixators can also be applied but its less desirable because of dense soft tissue mass in the region (Langley-Hobbs *et al.*, 1996) [5].

#### Materials and Methods

One year old, domestic short hair male cat weighing two kg body weight was presented with the history of fall from height, absence of weight bearing and swelling on thigh region of both the hind limbs. The cat was in sternal recumbency and there was presence of huge seroma at cranial aspect of right thigh region and at left thigh region seroma extended from thigh to caudal flank. Physical examination revealed pain on palpation and simple bilateral fracture with dislocation of distal femur. The distal end of the proximal fragment of left femur was palpable at caudal flank region. Lateral and ventro-dorsal radiograph revealed bilateral complete short oblique supracondylar femoral fracture along with huge soft tissue opacities at both the thigh region indicating seroma formation at fracture site (Fig.1). Modified Thomas splint was applied over the affected limb externally until the day of surgery. The animal was kept off feed and off water for 12 h before the surgery. The cat was anaesthetised using combination of atropine @ 0.04mg/kg, xylazine Hcl @ 1mg/kg and ketamine Hcl @ 20mg/kg and maintained using ketamine alone as bolus dose as and when required. Pre-operatively Inj. Ceftriaxone @ 20mg/kg and Inj. Meloxicam @ 0.2mg/kg were administered. Both the hind limbs were shaved from from lumbosacral region to mid tibia. The cat was placed in lateral recumbency and adequate amount of traction was applied on the fractured limb. The surgical site was cleaned, scrubbed and prepared aseptically prior to surgery. Fracture fragments were approached through cranio-lateral incision in routine manner and seroma fluid was drained out. Cross pinning was performed under fluoroscopy using 1mm K-wires. Lateral pin was inserted from lateral epicondyle obliquely to long axis of femur in ventro-dorsal direction. Then a similarly positioned pin was placed from the medial epicondyle. Anatomic reduction of fracture fragments was achieved after excision of distal end of proximal fragment and alternating advancement of each pin is performed to prevent loss of reduction during fixation

and the pins were advanced proximally along the medullary cavity. Care was taken that the wires cross above the fracture line. Surgical wound was closed in routine manner. Cross pinning of another limb was performed in same manner. Small skin incision on the dependent part was made for drainage of seroma at left caudal flank. Post operatively Inj. Ceftriaxone @ 20mg/kg for five days and Inj. Meloxicam @ 0.2mg/kg for three days were administered. Modified Robert jones bandage using aluminium wires with cotton padding was applied and both the hindlimbs were secured for two weeks and advised for complete rest.



**Fig 1:** Lateral and ventro-dorsal radiograph revealed supracondylar femoral fracture with huge soft tissue opacities at both the thigh region



**Fig 2:** Postoperative lateral and ventro-dorsal radiograph showing callus formation around fracture site on 4<sup>th</sup> week

## Results and Discussion

The patient was observed for 8 weeks. Modified Robert jones bandage was changed four times during the period. The surgical wounds healed properly and skin sutures were removed after 10 days. A single distal migrating pin on right side resulting in formation of seroma was removed on 4<sup>th</sup> week (Fig.2). Other pins were removed on 30<sup>th</sup> post-operative day. After removal of pin the cat was subjected to hot fomentation of the limb and physiotherapy and the cat recovered uneventfully. Cat was showing plantigrade stance with partial weight bearing on both hind limbs at two weeks post operatively which improved to digitigrade stance with complete weight bearing on 5<sup>th</sup> week. Different workers have suggested various techniques for fixation of supracondylar fractures. Among them simple intramedullary pinning, crossed K wires (Singh, 2000) [6], Rush pins (Mahajan *et al.* 2007) [7], dynamic intramedullary cross pinning (Whitney and Schrader, 1987) [8] and rigid fixation techniques (Aithal and Singh, 1998) [9] have been described for the repair of supracondylar fractures. The present case was managed by cross pinning with externally modified Robert jones bandage. In each technique there was implant related complications like pin migration, osteomyelitis, instability (Stigen, 1999) [10], lameness, non-union, malunion (Newton, 1985) [11] and quadriceps contracture (Ferguson, 1998) [12]. But in this case

except single pin migration, no other complications were observed. Aithal & Singh (1998) [9] reported early fracture healing in cross intramedullary pin as compared to single pin fixation. Boekhout *et al.* (2017) [13] reported that the physal fractures treated with fluoroscopic assisted percutaneous pinning healed in less than 12 weeks. Here the supracondylar fractures were stabilized under C-arm guidance and the healing was uneventful.

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