

J-PLATE FOR THE MANAGEMENT OF BILATERAL SUPRACONDYLAR FEMORAL FRACTURE IN A FEMALE DOG

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SUMMARY

A one-year-old intact, 18 kg Labrador Retriever female dog was presented with an etiology of high-rise syndrome with non-weight bearing lameness of both the hindlimbs. The animal was apparently healthy with haemato-biochemical and vital parameters within the normal limits. Orthopaedic examination revealed oedema, crepitus and pain at the distal femur of both the limbs indicating a fracture and confirmed as bilateral supracondylar femoral fracture on radiography. The fracture was stabilized bilaterally with 3 mm intramedullary pinning and plate osteosynthesis with 2.7 mm J-plate as plate rod technique. Postoperatively, satisfactory weight bearing was noticed from 2nd week onwards and the animal had an uneventful recovery.

Keywords: Femur, Supracondylar fracture, J plate, Plate rod technique, Dog

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Among all the long-bone fractures reported in canines, fracture of femur is reported to be the most common with incidence of 45 per cent; with supracondylar fracture type having of 6 per cent occurrence (DeCamp, 2016). The major constraints for stabilizing the supracondylar femur fracture are short length of distal segment, large medullary canal and the distal femur's caudal bow. Conservative management by external coaptation mostly results in fracture disease (Guiot *et al.*, 2012) and surgical fixation with regular implants often leads to implant failure and poor functional outcome. Hence, to support the biomechanics of supracondylar femur fractures specially designed condylarplates are required and is addressed as "J plate or hockey stick plates.

A one-year-old intact, 18 kg Labrador Retriever female dog was presented with an etiology of high-rise syndrome with non-weight bearing lameness of both the hindlimbs. Clinical examination revealed all the vital signs were within the normal limits and during physical and orthopaedic examination, oedema of both the lateral thigh regions with pain and crepitus, at the distal femur region were noticed. Orthogonal radiographs were taken and was confirmed as bilateral supracondylar femur fracture (Fig. 1). Haemato-biochemical investigation revealed normal values and the animal was prepared for Open Reduction and Internal Fixation (ORIF) procedure by intramedullary pinning and plate osteosynthesis with J-plate as plate rod technique. The animal was kept fasted for six and twelve hours for liquid and solid food respectively and both the lateral thigh regions were prepared for surgery. Pre-emptive antibiotic with Inj. Amoxycillin + Salbactam @ 12 mg/kg IV and general anaesthesia was carried out by

premedication with Inj. Butorphanol @ 0.2 mg/kg IV and Diazepam @ 0.25 mg/kg IV, induction with Inj. Propofol @ 4 mg/kg IV and maintenance with 1.5% Isoflurane in 100% oxygen. The lateral thigh region of both the limbs were prepared aseptically and incision was done cranio-laterally extending from greater trochanter to the stifle joint. The subcutaneous tissue was opened by blunt dissection and the Fascia lata was exposed. The Vastus lateralis muscle was retracted cranially and the Biceps femoris muscle caudally and it facilitated maximum exposure of the lateral aspect of the femur. The fracture fragments were anatomically reduced and a 3 mm Steinman pin was inserted as intramedullary pin in a retrograde fashion for additional support. On tension side of bone a 8 hole 2.7 mm J plate were applied by placing 4 screws distally and proximally to fix the fracture. The Fascia lata and subcutis were apposed with no. 1 PGA in simple continuous pattern and skin with 2-0 polyamide in cruciate pattern. The contralateral side of femur was also stabilized with the same implant and fixation techniques (Fig. 2). Postoperatively, Tab. Amoxycillin + Clavulanic acid @ 12.5 mg/kg, BID for 5 days and Tab. Meloxicam @ 0.2 mg/kg SID for 3 days orally were administered. The surgical site was cleaned and dressed routinely until complete wound healing was noticed. The animal movements were restricted for the first 10 days and grade 1 lameness was observed in first week and grade 0 by second week. The pain score was 2 for the first two days followed by 1. During the early ambulation period, partial transient knuckling was noticed in the right hind limb and return to normal was noticed following removal of pin, physiotherapy and rehabilitation. Shiju *et al.* (2010) and Wangchuk *et al.* (2021) also recorded similar postoperative complications

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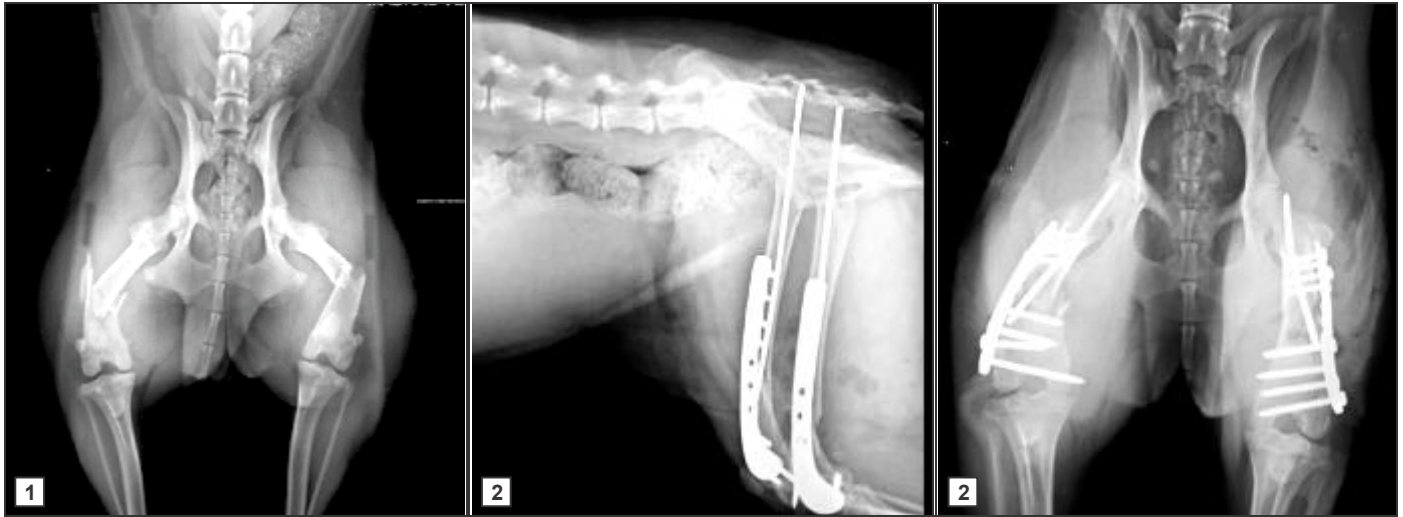


Fig. 1-2. (1) Bilateral supracondylar femur fracture; (2) Post operative cranio-caudal and lateral radiographs showing J plate and intra-medullary pin

and recovery after the pin removal. Incidence of bilateral femur fracture is accounted to be a rare and of which occurrence at the distal site is marked as unusual (Marwa *et al.*, 2022). Almost 86% of femoral fractures occur in animals of less than 5 years and 48% under the age of one year (Abd El Raouf *et al.*, 2017). The etiology reported was mostly trauma, either due to road traffic accident or fall from a height (Yayla *et al.*, 2022).

Reddy (2020) successfully stabilized supracondylar femur fractures with supracondylar femur plate (J plate) in cats and noted early weight bearing. The surgical stabilization techniques reported were intramedullary pinning with Steinman pin, specially modified double armed five cancellous negative end threaded pin, cross pinning with K wires (Gill *et al.*, 2018), rush pinning (Mahajan *et al.*, 2007), plating with reconstruction, dynamic compression and horn plates, plate/rod combination, interlocking nailing, modified type I external skeletal fixation (Piermattei *et al.*, 2006) and end threaded positive profile pin have (Yadav *et al.*, 2023) been described for the repair of supracondylar fractures.

Each technique was reported to be associated with implant related complications such as the pin migration, osteomyelitis, instability (Stigen 1999), lameness, non-union, malunion and quadriceps contracture (Gill *et al.*, 2018). Supracondylar fractures in dogs can be successfully treated with intramedullary pinning and plate osteosynthesis with J-plate which offers rigid fixation and counter all the forces and permit early ambulation.

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