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Cross pinning as an effective fracture stabilization technique for distal femoral Salter-Harris type II fracture in a dog

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Abstract

Distal femoral physal fractures are common in immature dogs and frequently classified as Salter-Harris type II injuries. Early surgical stabilization is essential to restore limb function and prevent growth disturbances. A 14-month-old male dog presented with acute non-weight-bearing lameness of the left hind limb following trauma. Clinical and radiographic evaluation confirmed a complete closed Salter-Harris type II fracture of the distal femur with lateral displacement. The fracture was stabilized using a modified cross-pinning technique through a lateral parapatellar approach. Two 2.5 mm Kirschner wires were inserted in a cross configuration and supplemented with additional medial and craniolateral pins to enhance stability. Postoperative radiographs confirmed satisfactory anatomical reduction and implant positioning. Clinical recovery was uneventful without implant migration or infection. The modified cross-pinning technique provided excellent mechanical stability and functional recovery.

Keywords: Canine, distal femur, physal fracture, Salter-Harris type II, cross pinning, Kirschner wire

Introduction

Physal fractures are commonly encountered in growing dogs due to the inherent weakness of the cartilaginous growth plate compared to adjacent bone structures. Salter-Harris type II fractures account for approximately 37% of all physal fractures in small animals (Harasen, 2001) ^[1]. The distal femoral physis is particularly predisposed to traumatic injury due to exposure to bending and shearing forces. Inadequate treatment may result in limb deformities and osteoarthritis.

Cross-pin fixation remains the standard technique for distal femoral physal fractures because it provides resistance against rotational and bending forces. Modified cross-pin configurations have been described to enhance construct stability (Miraldo *et al.*, 2020) ^[2]. The present case report describes successful management of a distal femoral Salter-Harris type II fracture using a modified cross-pinning technique without external coaptation.

Materials and Methods

A 14-month-old intact male dog was presented with acute non-weight-bearing lameness of the left hind limb following trauma. Orthopedic examination revealed pain, crepitus, and instability of the stifle joint.

Radiographic evaluation confirmed a complete, closed distal femoral physal fracture with lateral displacement consistent with Salter-Harris type II classification.

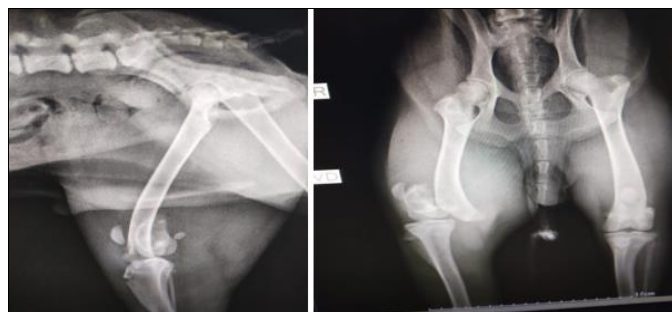
Preoperative management included buprenorphine (0.2 mg/kg) and gabapentin for analgesia. Surgery was performed using a lateral parapatellar approach. Anatomical reduction was achieved followed by insertion of two 2.5 mm Kirschner wires in a cross configuration at 40-45° to the femoral axis. Additional medial and craniolateral pins (2.0 mm) were placed to enhance stability.

Results

Postoperative radiographs confirmed satisfactory fracture reduction and proper implant positioning. The patient showed progressive return to weight bearing. No complications such as implant migration, infection, or loss of reduction were observed.

Discussion

Distal femoral physeal fractures require precise anatomical reduction to prevent long-term complications. Cross-pin fixation provides adequate mechanical stability. The addition of supplementary pins increases resistance to rotational and bending forces. The absence of implant migration in this case supports the mechanical advantage of the modified configuration.



Pre operative radiograph



Post operative radiograph

Conclusion

Modified cross-pinning with supplementary pin placement provided effective stabilization of distal femoral Salter-Harris type II fracture in a dog. The technique ensured satisfactory alignment and functional recovery without the need for external coaptation.

Conflict of Interest

The authors declare no conflict of interest.

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Not available

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