CASE REPORT
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PARA-OSSEOUS CLAMP ASSISTED CERCLAGE WIRING FOR MANAGEMENT OF TIBIAL FRACTURE IN A DOG

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ABSTRACT

A one-year-old female non-descript dog was presented with an owner's complaint of lameness and not bearing weight on left hind limb after it met with a road accident. Radiographs revealed comminuted fracture of mid diaphysis of left tibia. Under general anaesthesia open reduction and internal fixation was performed employing Para-osseous Clamp Assisted Cerclage stabilization (PCCS). Modified Robert Jones bandage was done as external support for 12 weeks. Post-operative radiograph showed good alignment and apposition. Animal was administered with antibiotic and analgesic post-operatively. Animal recovered completely with full range of motion by 16th post-operative week.

Keywords: PCCS, Orthopedic wire, K-wire.

INTRODUCTION

Fracture of long bones is a frequent orthopaedic condition observed in dogs. Different techniques, ranging from simple to complex procedures are in vogue for fracture management. Most of the techniques necessitate considerable instrumentation and use of costly implants. PCCS is a relatively new method of low-cost internal fixation technique that can be used to repair simple and comminuted fractures of long bones in dogs and cats (Wanivenhaus, 2001). The method involves paracortical anchoring of two K wires by their bent ends and cerclage wires. The present report records successful management of comminuted fracture of tibia using PCCS technique.

CASE HISTORY AND OBSERVATION

A female non-descript dog aged one year and weighing 16kg was presented to

the Department of Veterinary Surgery and Radiology, Teaching Veterinary Clinical Complex (TVCC), College of Veterinary and Animal Sciences, Pookode, Wayanad, Kerala with a history of road accident and non-weight bearing lameness of the left hind limb for three days (Fig.1). Physical examination of the affected limb evinced pain and crepitus over the mid-diaphysis of tibia. All physiological parameters appeared normal. Orthogonal radiographic views showed a short oblique, comminuted, mid-diaphyseal fracture of the tibia (Fig. 2).

TREATMENT AND DISCUSSION

Corrective surgery using the technique PCCS was resorted to under general anaesthesia. The fracture fragments were surgically exposed and reduced by traction and toggling. The first hole was drilled away from the fracture line through the *cis* and *trans* cortices of either proximal or distal fragments on the tension side of the bone. The holes were drilled approximately 90^0 to the diaphysis of the bone. The hole was drilled using K- wire of same size as that of selected K- wire clamp. One end of the K- wire was bent at 90^0.The length of the bent end was cut such that the tip of the bend end stood 2mm more than the depth of the hole. The proximal bent end of the pin was inserted to the proximal hole. The pin was then customized by adapting to the contour of the tension side of the bone. A hole for insertion of the distal end of the clamp was then drilled on the distal fragment away from the fracture line. A mark was made on the pin corresponding to the distal hole. The contoured pin was bent at the point corresponding to the hole in the distal fragment. The length of the bent portion of the pin was cut 2mm more than the depth of the hole. The distal end of the pin was inserted in the distal fragment and the fragments were reduced and held in position with bone holding forceps. Similarly, a second shorter pin was fixed at approximately 90^0 to the first K-wire. It was

Fig.1: Animal before surgery

Fig.2: Mid-diaphyseal comminuted fracture of tibia

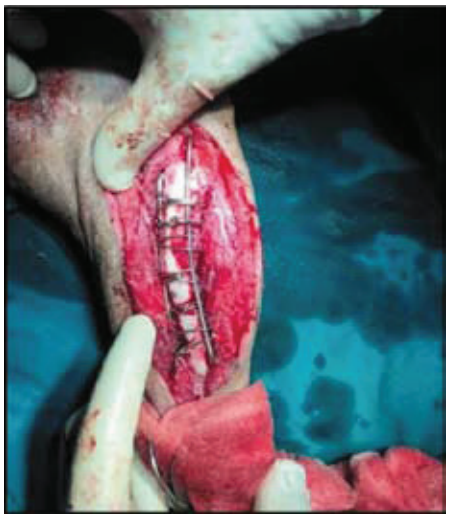

Fig.3: PCCS of tibia

Fig.4: Immediate post-operative radiograph

ensured that at least one end of each K-wire was bicortically engaged. The K-wires were anchored in position by placing double cerclage or single looped wires (Fig.3). The incision was closed routinely. External immobilization using modified Roberts Jones bandage was applied and reapplied at two weeks interval for a period of 12 weeks. Animal was administered with Ceftriaxone @20mg/kg twice daily for 7 days and Meloxicam @0.2mg/kg once daily for 5 days. Skin sutures were removed on 10th post-operative day.

Good apposition and alignment with mild angulation was observed on immediate post-operative radiograph (Fig.4). Complete weight bearing and full range of motion was achieved by 16th week (Fig.5). Radiographic and clinical union with good external callus was observed by 16th week (Fig. 6).

Fig.5: Animal on 16th week postoperative

Fig. 6: 16th week postoperative radiograph

The *Arbeitsgemeinschaft für Osteosynthese* (AOVET) suggested that the PCCS could be employed for simple and comminuted fractures of tibial shaft as a rigid internal fixation method. (Schwarz *et al.* 2005). Manchi *et al.* (2017) reported successful use of PCCS for management of radius- ulna fractures in toy breed dogs with reported median time of 13.5 weeks for radiographic union. Behrend (2007) explained that the micro-movement of the fractured fragments due to the flexibility of the pins could speed up callus formation. Ilker *et al*. (2015) opined that PCCS technique was preferred in veterinary orthopaedic surgery because of cost effectiveness and easy application.

CONCLUSION

Successful management of short oblique comminuted tibial diaphyseal fracture using PCCS technique is reported. This is the first report on use of PCCS technique for management of tibial fracture in a dog of higher weight category.

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