

Kirschner Intramedullary Pining for Femoral Fractures in Caprine

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Abstract: Artificial diaphyseal femoral fractures were conducted in eight goats under aseptic environment and immobilized by Kirschner Intramedullary Pin. Good results of healing were obtained through clinical and radiographic examination.

Key words: Kirschner intramedullary pin, fractures, goats, radio graphic

INTRODUCTION

The goat is one of the small domesticated ruminants which have served mankind earlier and longer than cattle and sheep. It is managed for the production of milk and wool, particularly in arid, semi tropical or mountainous countries. In Sudan, people keep goats for several advantages, such as; little food is needed, low cost management, low risk of total loss and its form of investment. Therefore, its productivity is lowered if they are not healthy. People in Sudan are not caring much to keep animals inside pens; this exposes them, especially goats to car accident which result in fractures. Therefore attention attracted towards fracture treatment and to evaluate the safety of intramedullary pinning advance technique as the first report in goat. Fracture fixation divided into external and internal fixation^[1]. The internal fixation include two distinct treatment modalities, plates and screws and intramedullary pins such as Kirschner pins, Rush pins, Leighton shuttle pin^[2]. Most of these pins applied by open-reduction, but occasionally some of them may be derived by close reduction^[3-6]. These metals may cause more inflammation if the soft parts are unduly traumatized during its application^[4, 7]. Permanent Shuttle pin is efficient for fracture immobilization in small animals^[8].

MATERIALS AND METHODS

Animals: Eight healthy desert goats (4-5 month age) of 25-30 (kg b. w.) were used. All animals were examined clinically and kept in pens within the premises of the College of Veterinary Medicine and Animal Production,

Sudan University of Science Technology. Animals were fed forage and sorghum for three weeks as acclimatization before the experiment conducted.

Surgical procedure: Left hind limb, prepared surgically to induce diaphyseal femoral fracture, (under epidural anaesthesia of 2% Lidocaine Hcl at dose (25 mg kg⁻¹ b.w). Skin was incised over the diaphyseal part of the femur; then the *fascia lata* was incised as close as possible to anterior border of the *biceps femoris* muscle. The *vastus-lateralis* and *biceps fermoris* muscle were retracted to expose the femur. Two covered scissors were passed under the femur to protect the under lining structures from being injured during induction of the fracture, the induced fracture was started with a Gigli saw (wire saw) and completed with hammer to have uneven cut fracture^[9]. Suitable size of Kirschner pin (trachel screw⁻¹, AESCULAP, Germany) was inserted in the proximal medullary canal by pin chuck to penetrate the *trochantric fossa* and protrudes through the skin with anti-clockwise direction, the pin being pulled proximally into the proximal fragment. Alignment of the two fragments was made to allow the pin to enter the medullary canal as described by Shnian and Markus^[10]. The extra part of the pin was cut close enough to be impeded under the skin. Procaine penicillin powder was sprayed locally, the fascia and subcutaneous tissue were sutured with simple continuous (2 0⁻¹ cat gut) and skin was sutured with simple interrupted pattern (2 0⁻¹ surgical silk)^[9]. Systemic antibiotic was used for 5 days.

Removal of the pin was made on 45 days post operative through small incision into the ceroma like swelling under local anesthesia.

RESULTS

Clinical and radiographic investigations were made during pinning and after pin removal to assess the healing of the bone.

Most of the operated animals has shown good results of walking, jumping and running and absent of the lameness on 2nd and 3rd week and absent of the lameness on the 5th and 6th week post operative.

An X-ray (55Kv, 0.2 Sec) has shown perfect alignment and callus formation on the 2nd, 4th and 6th weeks (Fig. 1- 3), respectively

Fig. 1a: 14 days (2nd week) post operative (Arrows indicates site of fracture

Fig. 1b: 14 days (2nd week) post operative Arrows indicates site of fracture

Fig. 2a: 30 days (4th week) post operative Arrows indicates site of fracture

Fig. 2b: 30 days (4th week) post operative Arrows indicates site of fracture

Fig. 3a: 45 days (6th week) postoperative after pin removal Arrows indicates site of fracture

Fig. 3b: 45 days 6th week) postoperative after pin removal Arrows indicates site of fracture

DISCUSSION

The use of the intramedullary pinning in small animal had been used successfully in 164 dogs affected with femur fracture^[10]. There are many external and internal splints which are used to immobilize the fractures in small animals, but only the internal splints are successfully suitable for femoral fractures such as intramedullary pins and bone plates^[4, 11]. Many studies have been conducted in Sudan to evaluate the disease status^[12-15]. The present studies indicated that Kirschner intramedullary pinning can be used successfully in immobilization of femoral fracture in goats. There is no apparent difference in the results of oblique or transverse fracture healing. The pin is safely with no complication and/or tissue reaction, economic and also available.

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