EPOXYPUTTY AS AN ADJUNCT TO STAINLESS STEEL CLAMP IN THE MANAGEMENT OF TIBIAL FRACTURE IN A GOAT USING EXTERNAL SKELETAL FIXATION *

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Abstract

Fractures are common in goats, though epidemiologic data on prevalence and predisposing factors is limited (Smith and Sherman, 2009).External skeletal fixation is a method of treating skeletal injuries by attaching bone to an external device. In the present study the fracture of tibia in a goat is surgically managed with uniplanar type II external skeletal fixator using stainless steel connecting bar, transfixation pin and clamp. Epoxyputty was used as clamps in two sites. Efficiency of fracture healing was studied clinically and radiographically and implant was removed in sixth week.

Keywords: *Goat, fracture, radiographic evaluation*

Food animals are excellent patients for treatment of orthopedic injuries because they spend a majority of time lying down, have a tremendous potential for bone healing, are resistant than other animals to contralateral limb breakdown and stress laminitis, and usually do not resist having orthopedic devices on their limbs (Anderson *et al.,* 2008). The curiosity and climbing instincts of goats, fracture secondary to struggling, trauma from dog attacks are common causes of limb bone fractures in goats (Smith and Sherman, 2009).External skeletal fixation can be used in small ruminants as a successful, economic, alternative to internal fixation. Kumaresan *et al*. (2012) reported the use of epoxyputty in the management of fracture in caprines. Epoxyputty is easy to apply, inexpensive, light weight and versatile (Kumar *et al.,* 2012).

Materials and Methods

A 110 day old Jamnapari cross breed kid was presented to University Veterinary Hospital Mannuthy with the history of lameness of left hindlimb since one day. On examination slight swelling on left hindlimb was noticed. Animal showed severe pain and showed non-weight bearing lameness of the limb. The clinical condition of the animal was normal excluding the lameness.

On physical examination, fracture of the tibia was noticed and it was confirmed

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by radiography which revealed spiral fracture of the midshaft of tibia (Fig.1).The limb was temporarily immobilized by applying Robert-Jones bandage and advised to bring the animal on next day after fasting.

Surgical Treatment

The surgery was done under deep sedation. Sedation was induced with xylazine[1]at the rate of 0.02 mg/kg bodyweight. Then the animal was given intravenously diazepam[2] (total dose 5mg on incremental doses) to effect, to maintain sedation. The affected limb was prepared aseptically for surgery. The site was shaved including the joints above and below the fracture site after scrubbing the area with Chlorhexidine- cetrimide solution. The site was washed and mopped dry.

Traction was applied to the limb by partially suspending the bodyweight on the affected limb for about 30 minutes before surgery. The animal was restrained on lateral recumbency with the surgical site up. The fracture was reduced to normal alignment and apposition by external manipulation. In this case the external skeletal fixator was applied by closed approach to the bone. The pins were introduced percutaneously through the safe corridors of the bone- craniomedial to caudolateral by hand through the soft tissue to the level of bone, and then drilled through bone using orthopedic drill. Two fixation pins were drilled through each fragment of the bone. The pins were drilled almost at right angle to the long axis of bone and parallel to each other. The pins were connected to stainless steel connecting bar using stainless steel connecting bar at six points (Fig. 2). In the two most proximal pin sites, epoxyputty was used to connect to the connecting bar on either side, since it allowed greatest advantage of applying pins at any plane (Fig. 3). Fracture stability was ensured.

The pin entry and exit points were covered with cotton soaked in Tincture benzoin. The pin entry points were covered with sterile cotton gauze pads and a bandage was applied with thick cotton padding around the fixator. Postoperatively antibiotic Ceftriaxone sodium[3]was administered for five days with at a rate of 20 mg/kg body weight intravenously. Tetanus toxoid injection was given intramuscularly postoperatively on the day of surgery.

Fig.1. Preoperative radiograph

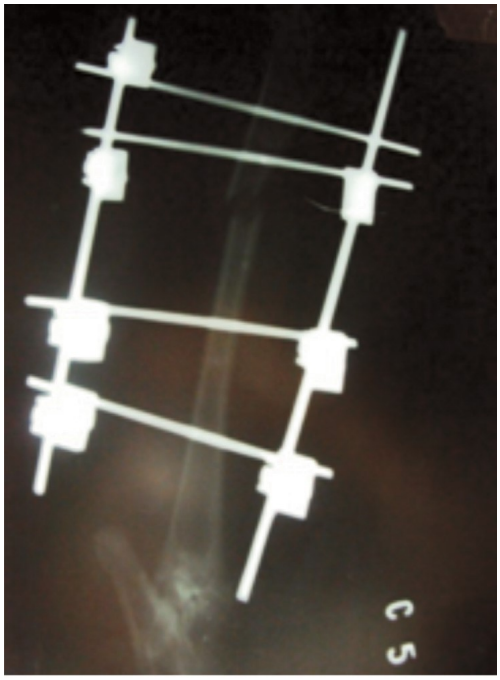

Fig.2. Immediate postoperative

Clinical, hematological, radiological, and biochemical evaluation was carried out preoperatively and post operatively at two weeks interval, up to six weeks. The healing was completed and implant was removed after sixth week since the gait of the animal was normal and also union was noticed in radiograph.

Fig.3. After applying Epoxyputty

Fig.4. Two weeks after surgery

Results and Discussion

Animal could make ground contact of the limb on the second day of surgery itself. Early return to sound functional limb indicated the stability of fixator. According to Rochat (2001), stable fixation was required to prevent delayed union and to avoid poor limb usage. Very good limb usage was noticed by 1st week itself. On

Fig.5. Animal with implant

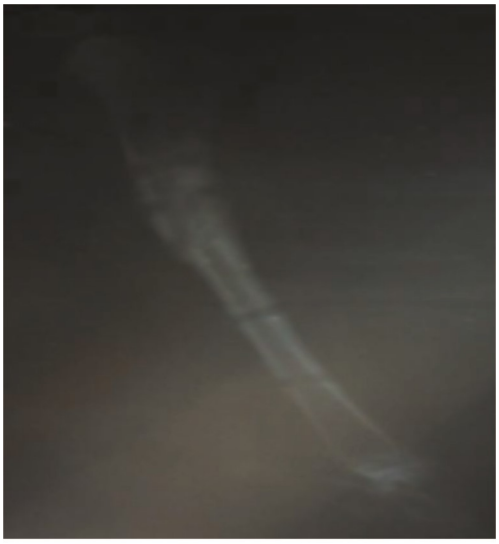

Fig.6. After removing implant (pin tracts)

radiological examination slight angulation was noticed on 2nd postoperative week (Fig. 4). Radiographic examination showed endosteal callus formation by second week and minimum callus formation indicating stiff fixation was noticed by sixth week completely occluding fracture gap (Figs. 5&6). So implant was removed by sixth week.

There was slight increase in alkaline phosphatase level by the second week of observation which got slightly decreased and coming to normal level in subsequent periods which may be due to the progress in fracture healing (Kaneko *et.al.,* 1998). There

was a significant decrease in serum calcium concentration by the fourth week and it remained almost stationary during the subsequent periods. Serum phosphorus concentration lowered during the fourth and sixth week of observation but was within the limit.

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1. Xylaxin (Xylazine Hydrochloride 23.22 mg /ml) Indian Immunologicals Ltd
2. Calmpose (diazepam 5mg/ml) Ranbaxy Diagnostic Ltd
3. Intacef 500 mg (Ceftriaxone injection) Intas pharmaceuticals Ltd