

Success Story

Management of long bone fracture in calves by Economical External Fixators

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Fracture of long bones in calves occupies a substantial proportion among musculoskeletal disorders. This is an acute traumatic injury warranting immediate management of surgical intervention for its correction. Metacarpal & metatarsal fractures are most common fractures in cattle of all age (Greenough et al., 1972). These fractures are frequently comminuted & open due to limited soft tissue supporting structures covering the bone (Turner, 1984 & Ferguson, 1982). Statistical data of long bone fractures in cattle reveals that metacarpal & metatarsal fracture occurs up to 50%, tibial fracture 12%, radius & ulna fracture 7%, femur fracture uncommon & humerus fracture 5%, so more than 68% fracture reported are anatomically below the elbow joint in the forelimbs & below the stifle joint in the hind limbs.

A severely comminuted fracture closed by application of an ESF is preferable to open reduction & internal fixation (Langley Hobbs et al., 1997). Economical ESF device comes in less than 20% of the original price of the external skeletal fixator. So, economical skeletal fixations have emerged as boon to both farmer & ruminant veterinary surgery. Present study conducted to evaluate of epoxy ESF for the management of compound fractures of long bones in calves.

Under university project on Management of long bone fracture in calves by Economical External Fixators was started with objective to evaluate epoxy & acrylic ESF for the management of compound fractures in small ruminant & calf. Study conducted on 12 clinical cases of compound fracture in calves. Out of twelve clinical cases of compound fracture, four observed in tibia-fibula, three in radius-ulna & five in metatarsal bones. All animals were control under pre-anaesthetic agent xylazene at dose rate of 0.1mg/kg body weight & general anaesthetic agent ketamine at dose rate of 5.0mg/kg body weight. After reduction of fracture, open wounds were cleaned with povidone-Iodine (Betadene) mixed with 0.9% normal saline solution.



In case of large wound, wound was closed with chromic catgut & silk in separate layer. All clinical cases of compound fractures were stabilized with epoxy external skeletal fixator by inserting four transfixation pins proximal to fracture & four distal to fracture. In each portion of fracture two pins inserted from medial side & two from lateral side (fig.ii). After pins insertion pins were bends & make a frame (fig.iii). Pins were supported with epoxy material (fig. iv). Post operatively all animals were treated with Ceftriaxone in combination with tazobactam (Inj Intacef-tazo) at the dose rate of 10 mg/kg body weight intramuscularly for 7-10 day depending on the healing of wound. The therapy was also adjunct with Meloxicam along with paracetamol (Inj. Melonex plus) at the dose rate 1ml/10kg body weight for 2-3 day as per required & regular dressing up to healing of wound.

The fracture site seemed to be stable in most of clinical cases of fracture. After application of economical ESF eight calves were able to stand & bear weight on the treated limbs. The transfixation device was well tolerated by the animals & did not interfere in their routine activity in most of clinical cases. The animal could sit, lie down & get up without any problem throughout the period of transfixation device. Pin tract infection was noticed in all clinical cases of calves, but severe pin tract infection & loosening of pins were seen in four cases. The intensity of infection was relatively more around the proximal than that seen around the distal transfixation pins. It was difficult to control the infection till the transfixation pins remained in situ. However, after removal of transfixation pins at the 6th post operative weeks, the infection could be controlled by meticulous cleaning & dressing with providone Iodine. Full functional weight bearing after device removal in six cases & partial in three cases observed. Mortality observed in three clinical cases of calves. Mortality occurred due to fumigating infection & continuous recumbency.

Economical external fixation technique was found effective & minimal invasive method for management of long bone fracture in calves with ensuring immobilization & better healing. It was also found that economical ESF is chief & easy than other method of management of compound fracture in calves.

Table I: Type of fracture & response of epoxy ESF management

Type of fracture	Animals Number	Percentage	Response of Survived	Epoxy ESF Dead
Tibia-fibula	4	33.33	2	2
Radius-ulna	3	25.00	2	1
Metatarsal	5	41.66	5	0
Total	12	100.00	9	3





Fig I. Clinical Cases of compound fractures



Fig .II Insertion of trans fixation Pins.



III formation of frame by bending Transfixation pins

Fig IV Application of epoxy material

Fig





Fig V Complete weight bearing after 6th postoperative week.

