



Femur Fracture Repair Using Internal Fixation Technique in Blue Bull (*Boselaphus tragocamelus*) Calf

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How to cite this paper

Ram Niwas, Kumar, S., & Priyanka. (2023). Femur Fracture Repair Using Internal Fixation Technique in Blue Bull (*Boselaphus tragocamelus*) Calf. *International Journal of Livestock Research*, 13 (8-9), 33-36.

Received : Jul 27, 2023
Accepted : Sept 27, 2023
Published : Sept 30, 2023

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Abstract

Fractures in wild animals roaming in free range are negligible but incidents increased manifold in recent years due to deforestation, urbanization, and highways passing through crop and forest areas. The present case report deals with fracture repair in a blue bull calf by automobile accident leading to femur fracture and its successful management using the internal fixation technique.

Keywords: Blue Bull, Calf, Femur, Fracture, Intramedullary Pin.

Introduction

Wildlife surgical cases with special reference to orthopaedic injuries have been on rise with increase in human wild life conflict but still there is paucity of literature describing surgical interventions. Fracture of long bones is very common in domestic animals and the incidence of fracture is highest in young animals (46.02%) of less than six months of age (Simon *et al.* 2010). Aithal *et al.* (1999) reported the highest number of fractures in the femur (38.56%) followed by tibia-fibula (17.16%), radius-ulna (16.92%), and humerus (7.71%). Among the four long bones in dogs, the hind limbs are more commonly involved than the forelimb (Minar *et al.* (2013). Management of fractures in small animals like dogs or cats is very easy because of less body weight but fracture repair in wild animals like blue bulls, is a very tedious job as they are very vulnerable to drastic and abrupt behavioral changes when kept in captive management for any ailment, however the basic principle of fracture reduction and immobilization remains the same. These wild ungulates are very nervous and temperamental animals and therefore, chemical immobilization may be associated with a high percentage of complications and fatalities. The anesthesia, post-operative care self-immobilization, etc. are special issues and need to be addressed properly. The intrinsic and extrinsic forces generated on the fractured part must be neutralized by the fixation method and the structural properties of the bone must be restored to their normal phase (Beale, 2004; Olmstead *et al.*, 1984; Brinker, 1974; Aron, 1998) and restoration of the structure, composition, and function of the fractured part is the goal of the fracture stabilization using various techniques depending on type of fracture and bone involved.

History and Clinical Observations

A two-and-a-half-month-old male blue bull calf was presented with a history of lameness due to an unknown injury and was presented to the Veterinary Clinical Complex, Hisar by officials of wildlife in collaboration with members of a non-government organization. The calf was alert (Fig 1a) and the left hind limb was kept in a slightly flexed position. After spending some time with the calf to overcome the anxiety of the animal due to an indifferent environment, it was examined clinically. There was a crepitating sound on the manipulation of the femur bone and mild swelling due to hematoma formation at the fracture site. A radiographic examination was conducted and fracture (Fig 1 b) was classified as 32A2 as per AO/ASIF classification (Muller et al.1990) indicating a good prognosis.

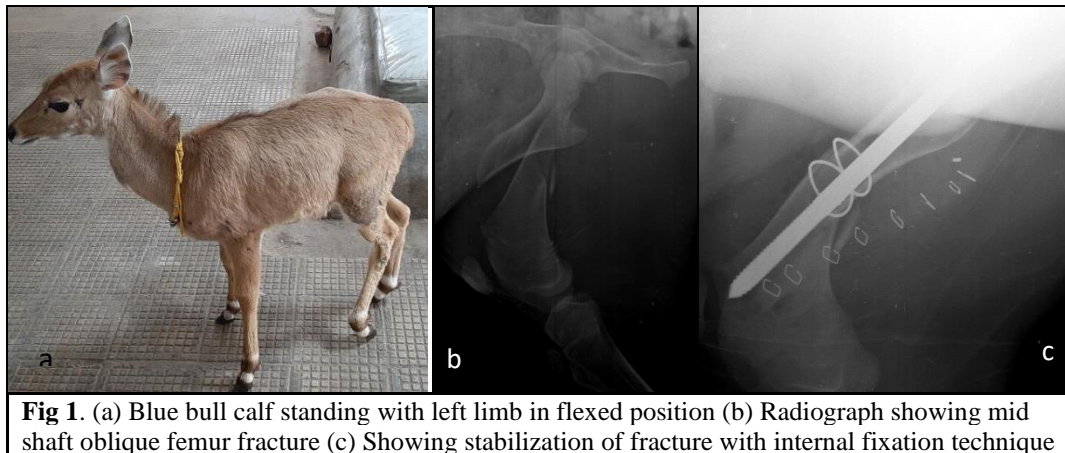
Surgical Technique

The animal was prepared for aseptic surgery and the anaesthetic protocol used was similar to bovine (*bovidae* family). General anesthesia was achieved using Propofol @ 5mg/kg b. wt. (to effect) after premedication with atropine sulfate @ 0.04mg/kg b. wt. and maintained using Isoflurane (0-5%) mixed with 100% oxygen after intubation. The calf was positioned in right lateral recumbency after draping, a 6 cm long incision was made on the cranio lateral aspect at the mid of femur. Tensor *fascia lata* muscle fibres were dissected longitudinally just near to quadriceps muscle. A complete oblique and displaced fracture were appreciated. A small bone fragment devoid of muscle attachment, embedded in muscle mass was removed. A 3.5 mm end threaded intramedullary pin in retrograde fashion is inserted after achieving reduction and alignment. Increased stability was obtained by ancillary support with two orthopedic 20 G stainless steel wires (Fig 1c). Thorough lavage of the surgical site was done using a normal saline solution. The muscles were sutured using Vicryl #0. The subcutaneous tissue was closed using Vicryl of the same thickness. Finally, the skin was apposed with stainless steel staples. The surgical site was then covered with a sterile dressing and bandage. Despite the lengthy procedure, recovery from anesthesia was uneventful. The calf was able to stand within 25 minutes after recovering from general anesthesia. Post-operatively injection of Ceftriaxone @13mg/kg, and injection of Meloxicam (0.5 mg/kg) were prescribed for 3 days along with antiseptic dressing till healing. Special precautions to keep animal in a stress-free environment but with restricted movement was also advised. Two months postoperatively, the NGO reported that the calf has shown complete recovery with slight occasional jerky movement. The calf was housed individually for two months to avoid any complications and was finally released to its natural habitat with intact implants.

Discussion

The frequent occurrence of hind limb fractures indicates that the even presence of abundant muscles does not fully protect the femur from getting fractured. However, increased forces and moments placed on proximal bones caused by physical factors, such as muscle forces used for locomotion and resistance to the forces of gravity; ground

reaction forces as limbs strike the ground; and the long moment arm at the proximal aspect of the limb, compared with the distal portion of the limb probably make them more susceptible to fracture (Markel *et al.*, 1994). Moreover, Singh *et al.* (1983) opined that most such fractures were caused by automobile accidents, where the animals were most likely to be hit from behind, as the animals were slow to react from their hindquarters.



Conclusion

Fracture in wildlife animals is very frequent due to deforestation and several factors should be considered when choosing a method of repair for wildlife with fractured limbs. Economic constraints and the demeanor of the animal may limit the number of options. However, timely presentation and optimum post-operative care result in anticipated recovery.

Contribution by Authors

Equal contribution

Conflict of Interests

There is no conflict of interest.

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