

SYNTHETIC MATERIAL USED FOR REPAIR OF TIBIA AND FIBULA FRACTURE IN A TIGER

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Management of fracture in wild and captive animals pose problems for zoo veterinarians mainly in controlling the animal and preventing self-mutilation (George *et al.*, 1986). In earlier times, wood, elephant tusk, large animal bones, cow horns, and tendons have been used to serve as a mechanical scaffold and assist in treatment of fracture. But due to lack of their availability in field emergency conditions, synthetic materials were used by orthopedicians for the purpose. Very little information is available in literature regarding the use of synthetic materials i.e. articast for the repair of fracture of wild animals. This communication describes successful use of synthetic material articast for treatment of tibia and fibula fracture in a tiger.

Case history and treatment

A tiger aged about 10 years weighing approximately 250kg was presented with severe right hindlimb lameness after shifting into the cage in Alipore Zoological Gardens. The animal was heavily panting with salivation. Clinical observation revealed inflammatory swelling of the limb just below the stifle joint. There was a crepitus and pain on voluntary movement. Abnormal movement of the fractured end of tibia and fibula was also noticed. Radiological examination revealed a complete comminuted fracture of proximal end of right tibia and fibula (Fig. 1). Since the fracture seems to be irreparable, closed reduction and immobilization was decided upon.

The animal was shifted to a squeeze cage and was given Inj. Tramadol hydrochloride 4 ml intramuscularly for analgesia. The atropinised (0.04mg/kg b.wt. S/C) tiger was then sedated with xylazine hydrochloride @ 1mg/kg and ketamine hydrochloride @ 8mg/kg body weight intramuscularly. The tiger was left undisturbed for the onset of anaesthesia. Ten minutes after the administration of the drug, the animal showed signs of sedation and quickly went to state of recumbency. Closed reduction and immobilization of the fracture site was decided by using 'articast'. Articast is a glass fiber based material used in a similar name to

conventional plaster of paris bandage. The material is available as 3.4' and 5' roll either in blue, white or pink colour. The material should be used within two minutes of dipping in lukewarm water other wise it will set. Each 5' roll of the material weighs 160g after dipping in water. Reduction of the fractured limb was carried out through extension, counter extension and local manipulation. Tricofix (elastic tubular underwrap) was worn followed by wrapping of an uniform layer of cotton wool. One roll of 5" blue coloured articast was first dipped in lukewarm water and passed for two times. After that, the material was wrapped from the joint proximal to the fracture site to the level of metatarso-phalangeal joint in a spiral motion by layers of wrapping (Fig. 2). Three rolls of articast were used in the present case.

The animal was kept under Ringer's solution drip during the entire period of operation. Post-operatively the animal was given the following treatment.

1. Inj. Enrofloxacin 6ml twice daily intramuscularly for seven days.
2. Inj. Tramadol hydrochloride 4ml daily intramuscularly for five days.

The weight-bearing capacity of the limb increased gradually with time and by four weeks the animal was able to walk with some degree of lameness. The artifact was removed after eight weeks. The animal recovered uneventfully with gradual functional normalcy of the limb by 3.5 months.

External coaptation is useful as an adjunct to internal fixation and provide excellent stabilization for many orthopedic soft tissue injuries. Casting material can effectively neutralize bending forces and possibly rotational forces (Decamp, 1993). Several methods of fracture repair by simple full limb cast (Reichel, 1956), hanging pin cast (Gill & Tyagi, 1972), bamboo splints (Selvam *et al.*, 1996), bone plating (Ranganath *et al.*, 1997) and modified Thomas splint (Sen & Mazumder, 1990) have been tried with variable success in large domestic and wild animals. In the present case, articast was used for immobilization of fracture ends which offers satisfactory result without any apparent complication. Intramedullary pinning is of no value in this case as proximal fragment was fractured in such a way that no place was left for holding the pin.

Xylazine and ketamine hydrochloride anaesthesia used in the present case, was found safe and the recovery was uneventful. Wallach and Boever (1983) recommended the use of the material xylazine and ketamine hydrochloride for immobilization of wild felines.

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References

- Decamp, C.E. (1993).** External coaptation, pp. 1661-1676. In: Slatter, D. (editor). *Text Book of Small Animal Surgery*. WB Saunders, Philadelphia.
- George, P.O., J.V. Cheeran, A.M. Jalaudhin, K. Rajankutty and C.A. Varkey (1986).** Treatment of wounds on the forelimb of a lion (*Panthera leo*) under general anaesthesia. *Indian Veterinary Journal* 63: 952-953.
- Gill, B.S. and R.P.S. Tyagi (1972).** A study on the fracture repair and management of long bones in large animals with special reference to external fixation. *Indian Veterinary Journal* 49: 386-398.
- Ranganath, L., B.N. Rangath, C.L. Srinivas, R. Nagaraja and S.M. Jayadevappa (1997).** Treatment of fracture of tibia and fibula in a male panther (*Panther pardus*). *Indian Veterinary Journal* 74(9): 783-784.
- Reichel, E.C. (1956).** Treatment of fracture of long bones in large animals. *Journal of American Veterinary Medicine Association* 129: 8-11
- Selvam, N.P., R. Thiruthalinathan and D. Swaminathan (1996).** Radius and ulna fracture in a tiger cub (*Panthera tigris*). *Zoo's Print* 11 (3): 22.
- Sen, T.B. and B.K. Mazumdar (1990).** Treatment of numeral fracture in a white tiger cub in Alipore Zoo. *Indian Journal of Veterinary Surgery* 11(2): 55-57.
- Wallach, J.D. and W.J. Boever (1983).** *Diseases of Exotic Animals*. W.B. Saunders, Philadelphia, 353pp.



Figure 1. Radiograph showing complete comminuted fracture of proximal end of tibia and fibula



Figure 2. Wrapping of articast from the joint proximal to fracture site to metatarso phalangeal joint area