

## **CLINICAL AND RADIOGRAPHIC FINDINGS IN HEALING OF FRACTURE OF METACARPUS IN CALVES TREATED WITH FRESH AUTOGENOUS RIB GRAFTS**

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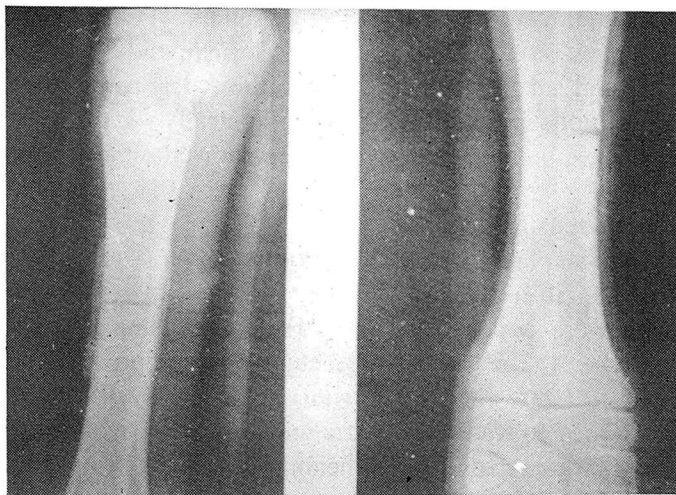
Bone grafting hastens healing of fractures in animals (Whittick, 1975). Binnington (1990) reported that autogenous bone grafts can be used to treat large fracture defects where additional stabilization is needed. Bone grafts can be used in the form of onlay grafts or inlay grafts, kept in position by cerclage wire, screws, smillie nails or bolts. The present study describes the healing of fracture of metacarpus in calves treated with autogenous rib grafts.

### **Materials and methods**

The study was conducted on 12 crossbred male calves, six to twelve months of age, weighing 50 to 80 kg, divided into two groups of six animals each (Group A and B). Sedation with Triflupromazine hydrochloride (0.25 mg/kg body weight) intramuscular and diazepam

(0.20 mg/kg body weight) intravenous were combined with local infiltration analgesia using 2% lignocaine hydrochloride to control the animals for surgery. A transverse mid shaft fracture was created on the right metacarpus by open method.

In group A, the fracture was reduced and two freshly cropped autogenous rib grafts were positioned subperiosteally, one on the anterior aspect and the other on the posterior aspect of the metacarpus (Fig. ). The grafts were fixed in position by hemicerclage wiring at two points using stainless steel wire. The limb was immobilized with four cotton padded bamboo splints and plaster of paris cast. In group B, the fracture was reduced, the wounds were sutured and the limb was immobilised with four cotton padded bamboo splints and plaster of paris cast.



The animals were kept under observation for six weeks and the bones from two animals in each group, were harvested at two weeks, four weeks and six week for histopathological studies.

## Results and discussion

All the animals could get up and lie down without assistance by second week. Four animals of Group A and three animals of Group B started bearing weight on the fractured limb during the period of observation. Favouring of the fractured limb, limping and nodding of the head were observed in all the animals. Pawing with the fractured limb and stumbling were observed in two animals each from both the groups. Dragging of the toes was observed only in one animal, in group B. Biswas (1990) observed that the animals could get up and lie down without assistance and walk by the first week after External Immobilization. Ayyappan (1981) observed lameness in calves upto six weeks and the animals could bear weight on the limb by 30 days after treatment. Infection and suppuration at the suture line were observed by the end of second week in one animal of group A. Singh *et al.* (1984) and Rao *et al.* (1985) reported that infection and malalignment were the common complications in treatment of fracture in animals.

Plaster of paris cast remained intact throughout the period of observation in all the animals. Sutures of the rib harvest site and Sham operation site were removed on the 10<sup>th</sup> post operative day. The sutures from the fracture repair site were removed when the plaster cast was removed. One animal from Group A and four animals from

group B required reinforcement of plaster cast. The necessity of plaster of paris cast as external support for effective immobilization was recommended with bone grafting or bone plating in animals (Tyagi and Gill, 1972; Singh and Nigam, 1975 and Rao *et al.*, 1983).

Grafts were in position in all the animals throughout the period of observation. They became radiographically indistinguishable from fourth week onwards. Radiographically visible callus was noticed by the third week in Group A whereas early ossification centres were noticeable by the end of first week in group B. Partial obliteration of the fracture gap was observed by the end of fourth week in both the groups. Marked displacement of the distal fragment was noticed in one animal each in Group A and B and deviation of the distal fragment at the fracture site was observed in one animal of Group A and four animals of Group B. Braden and Brinker (1976) reported that movement of fracture fragments resulted in the formation of fibrous callus by seven to fourteen days. Kirk (1952) opined that bone grafts act both as local reservoir of calcium and as splints. Fessler and Amstutz (1974) and Ackerman and Silverman (1978) opined that the fracture line would be radiographically evident even when the fracture showed clinical union.

## Summary

Healing of complete mid-shaft metacarpal fracture was studied in calves after treatment with autogenous rib graft. Stability of fragments was better with rib grafting and healing was quicker and better.

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