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Surgical management of tibiotarsal bone fracture in a pigeon

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Abstract

An rescued pigeon was presented to Veterinary Dispensary Ramohalli, Bangalore after being found unable to walk. On examination of the bird revealed inability to stand on its left limb and crepitus on palpation was noticed at left thigh region. Survey radiograph revealed complete transverse fracture of the left tibiotarsal bone. The fracture was stabilized by Intramedullary pinning under General anaesthesia and immobilized with Robert Jones bandage. Bird recovered uneventfully and was able to walk after 20 days of surgery.

Keywords: Tibiotarsal, radiograph, fracture, anaesthesia

1. Introduction

Bone fractures are common in both wild and captive birds (Houston, 1993) [9]. Avian bones, including limb bones, are thin brittle and tend to break into fragments upon a variety of natural events like midair collisions, fights with other birds (Houston, 1993) [9] or anthropogenic experiences like gunshot wounds, collisions with automobiles or fences, encounters with traps and attacks by animals like dogs and cats (Fix and Barrows, 1990) [7]. Tibiotarsal fractures were common in birds because it is long and most exposed bone to the external injuries (Arias *et al.*, 2015) [3]. Avian bones have thinner cortices and are more brittle than mammalian bones. Avian bones lack haversian systems and the medullary cavity is crossed with bony struts that play an important role in the overall strength of the bone (Tully, 2002) [11]. Endosteal blood supply and callus formation are particularly important for avian fracture healing. This has important implications if intramedullary implants are to be used (Bush *et al.*, 1976) [6]. Bones stabilized with intramedullary pins had more periosteal callus and inflammation at the fracture site. This paper deals with the surgical management of complete transverse fracture of tibiotarsal bone by intramedullary pinning in a pigeon

2. Case history and observations

A pigeon weighing 300 grams was presented to the Veterinary Dispensary Ramohalli, Bangalore after being found unable to walk and not bearing weight on left leg (Fig.1). Physical examination revealed swelling and crepitus at left tibiotarsal region. Radiograph of antero-posterior and medio-lateral views of left leg revealed closed, complete, transverse fracture of left tibiotarsal bone (Fig.2). It was decided stabilize the fractures by intramedullary pinning.

3. Surgical treatment

The pigeon was sedated with Inj Diazepam @ 1mg/kg body weight intramuscularly and anaesthesia was done by using Inj Ketamine @ 30mg/kg body weight intramuscularly. The feathers were removed from the affected leg and surgical site was prepared aseptically after scrubbing with 7.5% povidine iodine solution (Fig. 3). The pigeon was positioned on the table in lateral recumbency. The lateral skin incision was made at the fracture site. Subcutaneous tissue and muscles were dissected to expose the proximal fracture end then 1.2 mm K wire was inserted using retrograde technique (Fig.4). Muscle was sutured with catgut No 2-0 with simple interrupted pattern and skin was opposed with monofilament Polyamide No-2-0 using simple interrupted pattern. Wound was cleaned and dressed with povidine iodine ointment and the leg was immobilized using Reinforced Robert Jones bandage. Postoperatively the pigeon was administered orally with Enrofloxacin @ 10 mg/kg body weight BID for seven days and additionally supplemented with multivitamin and calcium gluconate supplement.

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Sutures were removed on 10th postoperative day and pigeon recovered uneventfully. Bird was able use the limb for ambulation after 20 days of surgery (Fig. 5).



Fig 1: Fractured left tibiotarsal bone in pigeon



Fig 2: Simple complete transverse fracture of the left tibiotarsal bone in pigeon



Fig 3: Aseptically prepared surgical site



Fig 4: Insertion of K wire by retrograde technique at the site



Fig 5: Weight bearing pattern on 20thpost-operative day



Fig 6: Radiograph showing clinical bone union on 20thpost-operative day

4. Discussion

Avian bones have a comparatively higher mineral content, resulting in an increased incidence of open, comminuted fractures with multiple sharp fragments that can be traumatic

to surrounding soft tissues. Because distal limb fractures in birds are especially prone to rotation, simple casts will not oppose these forces. The present case had multiple fractures in the tibiotarsal bone. Transverse fractures are most commonly recorded and rotational and shear forces must be stabilized in order to achieve good bone regeneration. The most common complication in healing of avian fractures is sepsis (Amand, 1977) [2]. The small muscle mass and thin skin give rise to frequent compound fractures-especially of the wings. Osteomyelitis, which was a common problem in mammals, is relatively rare in birds, presumably due to their increased body temperature (Altman, 1977) [1]. However, compound fractures involving the humerus and femur leave an open path into the air sacs and air sacculitis may be seen (Redig and Roush, 1978) [8].

In small birds K-wires or 18 to 26 gauge hypodermic needles may be used for intramedullary pinning (Gandal, 1969) [7]. In the present case, 2 mm K wire was used to stabilize the fractured fragment and it gave satisfactory result without any complications like osteomyelitis, pin migration etc. Care must be taken when indwelling of pins, as small bones tend to splinter very easily (Wallach, 1973) [10]. Two distinct disadvantages of all intramedullary pins are the lack of dense bone in the metaphyseal region of the bone and the presence of very fine bony trabeculae throughout the length of the bone. These allow for pin migration and rotational instability around the pin at the fracture site (Bush, 1977) [5]. To overcome the rotational forces, the fractured leg was stabilized with Robert Jones bandage. Another disadvantage of using Steinman pins in the marrow cavity may lead to fissure fracture (Arnall and Keymer, 1975) [4]. Avian orthopaedics presents a unique challenge to the veterinary practitioner, but with a good knowledge of bone repair techniques in mammals and an understanding of the anatomical and physiological differences in avian patients, repairs can be effective, rewarding and ultimately successful.

5. Conclusion

A successful surgical management of complete transverse fracture of tibio-tarsal bone in a pigeon by intramedullary pinning is reported.

6. Acknowledgment

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