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Case Study

SURGICAL MANAGEMENT OF FEMUR FRACTURE IN INDIAN RING-NECKED PARAKEET (PARROT)

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ABSTRACT
A case of left femur fracture was reported in a male Indian ring-necked parakeet (parrot) of 2 years of age. Diagnosis was done based on clinical examination, physical findings and radiological examination. Retrograde intramedullary pinning method was opted for surgical treatment of the injured bird. After 60 days of operation, the animal made an uneventful recovery without any complication.

KEYWORDS: Fracture, intramedullary pinning, K-wire, osteomyelitis.

INTRODUCTION

Fracture is one of the major problems for both domestic as well as wild birds (Coles, 2007); more commonly observed in wild birds under captivity, as caged birds are more prone to stress and are also vulnerable to self-inflicted injury (Goody *et al.,* 2012). Moreover, both captive and wild birds are predisposed to fractures of long bones due to some traumatic injury (Donely, 2011). Wings and legs are the area of fractures most commonly encountered in birds (Kubiak and Forbes, 2011). Fracture treatments of injured birds are crucial for their survival and well-being. An ideal fracture fixation should hold the bone in suitable place, allowing bone union of the fractured ends, and provides bone strength and protects from stress. However, the designs and methods for fracture treatment in birds have been done following the fracture treatment procedures in small animals and humans (Redig and Cruz, 2008). Similarly, internal fracture fixation may be used for the management of fractures in both medium and large birds in a similar fashion as mammals. However, the major problem associated may be the lack of appropriate sizes of internal fixation devices, as most of the implants were developed for human or small animal use. Additional complications involved with internal fixation are inadequate exposure, minimal sepsis and articulation insult (Redig and Roush, 1978). The present case deals with successful management of a femur fracture in an Indian ring-necked parakeet (parrot).

CASE HISTORY & CLINICAL OBSERVATIONS

A male Indian ring-necked parakeet (parrot) of 2 years was presented with a history of accidental injury by ceiling fan while flying and non-weight bearing lameness of the left hind leg. On physical examination and palpation of the affected leg, the animal exhibited pain and the sharp edge of the facture fragment was also palpable. Further, the proximal fragment of the fracture end was exposed outside the skin [Fig. 2 (A)]. Radiological examination was employed to determine the nature of fracture and the type of immobilization technique to be used for the fracture treatment. Radiography ultimately confirmed complete oblique fracture of left femur [Fig. 1 (A)]. Based on the clinical and radiographic findings, internal fixation of fracture using intramedullary pin was recommended for the immobilization procedure to be carried out.

TREATMENT & DISCUSSION

Prior to the surgery, the area of fracture was clipped, scrubbed, and the rest of the area was draped; followed by aseptic preparation of the surgical site as per the routine procedure. The bird was anaesthetised using Ketamine (Ketmin @ 50 mg/ kg b.wt I/M) and was kept in lateral recumbent position with the affected limb upward to the desired position. An incision was made on the site of the fracture and the fractured bone was exposed. A K-wire of 1.1 mm diameter was introduced through the fractured site to the proximal part initially exiting at the hip and then pushed to the distal part of the bone with the help of a chuck [Fig. 2 (B)]. The retrograde pinning was done up to the desired length and the remaining part of the pin protruding out from the body was cut using a pin cutter. The muscle layer was sutured in a continuous suture pattern using absorbable suture material (Catgut 2-0) and the skin was sutured in an interrupted suture pattern using non-absorbable suture material (Ethilon 3-0). The wound was bandaged and dressing was done regularly using Betadine and Staphban ointment along with antibiotic injection (Intacef @ 25 mg/kg b.wt) once daily for five

days and NSAID (Melonex @ 0.2 mg/kg b.wt) once daily for three days. The radiograph was taken immediately after surgery which showed correct alignment of the bone [Fig. 1 (B)] and subsequently after every 15 days; which were evaluated for fracture reduction, implant position, any complication, time taken for callus formation and time taken for complete bone healing. Skin sutures were removed after healing of external wound at 15 days [Fig. 2 (C)] and the fracture uneventfully healed after 60 days, which was determined by clinical union revealed by radiography [Fig. 1 (C)] and the patient regaining its original locomotory function.

Internal fixation by intramedullary pinning has been described for the management of avian fractures (Islam *et al.,* 2002, Rahal *et al.,* 2008). The present treatment was also done replicating the fracture treatment procedures in small animals (Redig and Cruz, 2008), as most of the fixation device available are designed for human and small animals. For diaphyseal femoral fractures, the pin is typically introduced at the fracture site, retrograded proximally till it exits the hip and then pushed back distally (Redig, 2005). For intramedullary pinning in small birds, K-wires or 18 to 26 gauge hypodermic needles may be used (Graham, 1975 and Mandrill, 1975). However, care must be taken while implanting, as small bones tend to splinter very easily (Altman, 1969 and Graham, 1975). Steinman pins may also be used for retrograde pinning in larger bird. Two distinct drawbacks of all intramedullary pinning in birds are the lack of bone density in the metaphyseal region and the presence of very fine boney trabeculae throughout the length of the bone. As a result, slight migration and rotational instability of pin around the fracture site was observed (Arnall and Keymer, 1975 and Bush, 1977), but without much complication. Interestingly, the callus in bird fractures forms primarily on the inside of the bone. This gives excellent stability and reduces healing time, but also reduces the long time dependency on intramedullary devices for fracture repair (Bush, 1977). Probably the most common complication in healing of avian fractures is sepsis (Redig and Roush, 1978), which was not noticed in this case, may be due to appropriate antibiotic umbrella. Osteomyelitis, which is a common problem in mammals, is relatively rare in birds, probably due to their increased body temperature (Altman, 1977 and Mandrill, 1975). Despite some post-operative complication like loosening of the pin, the patient recovers uneventfully after 60 days. So, after a complete union of the bone and the patient finally regained original locomotory function, we concluded that midshaft fracture of femur in bird can also be successfully managed by using intramedullary pinning to a satisfactory clinical outcome.

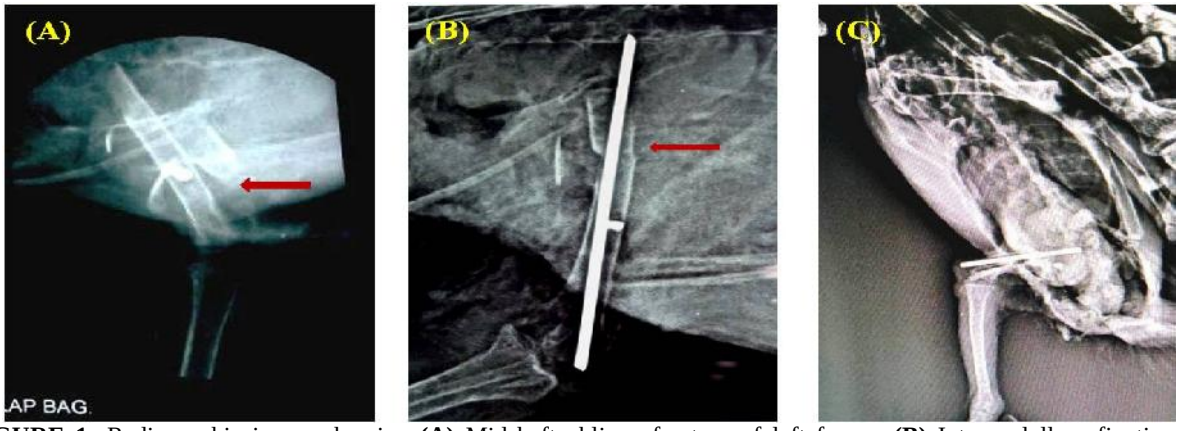

FIGURE 1: Radiographic image showing **(A)** Midshaft oblique fracture of left femur, **(B)** Intramedullary fixation of fracture just after the operation with proper alignment, **(C)** Healing and primary union of the fractured bone after 30 days.

FIGURE 2: Photographs showing **(A)** Exposed proximal fragment of the fractured bone, **(B)** Retrograde pinning with the surgical site, **(C)** Healing of the incisional wound after 15 days.

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