

REPAIR AND MANAGEMENT OF FRACTURED WING IN AN INDIAN PEAFOWL (*Pavo cristatus*)

SYAM K. VENUGOPAL, ANOOP S., SHERIN B. SARANGOM*, SUSANNAH BIJEE PHILIP, SHARANYA PRAKASH, BINI JOY AND ASHAY P. KANKONKAR

Department of Veterinary Surgery and Radiology, College of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala – 680 651, India

* Corresponding author: sbs04vet@gmail.com

ABSTRACT. The reports on wing bone fractures are common in avian species, but are scanty with peafowl. An Indian peahen (*Pavo cristatus*) was presented with a wounded unstable left wing and inability to fly. Crepitus could be felt on palpation and the radiographic examination showed an open, transverse, mid-diaphyseal fracture of humerus. Open reduction, internal fixation and wound closure were performed under general anaesthesia followed by external coaptation of the operated wing. Post-operative antibiotics and analgesics were administered. By third week, clinical signs of healing were noticed and physical therapy was advised. The bird recovered uneventfully and was released. A unique case on management of transverse humerus fracture rarely reported in peafowl is documented.

Keywords: Fracture, humerus, wing, peafowl, internal fixation, external coaptation

INTRODUCTION

The Indian peafowl (*Pavo cristatus*), also known as the common peafowl, found widely across India, Pakistan and Srilanka,

is a very popular species maintained in the zoological gardens all over the world. However, the reports on management of surgical conditions, particularly wing bone fractures, affecting Indian peafowl are scanty, although common in captive as well as wild birds. Even though exact anatomical reduction may not be necessary in these flight birds, the restoration of a fully functional wing is very important (Orosz, 2002). Obviously, the repair of wing bone fractures is a challenge. The successful management of an open, transverse, mid-diaphyseal fracture of humerus in an Indian peahen by open reduction internal fixation, external coaptation and physical therapy is hence documented.

MATERIALS AND METHODS

An injured Indian peahen, rescued by the Kerala Forests and Wildlife Department, was presented with an unstable left wing and inability to fly. The bird exhibited fear of humans, but permitted handling of injured wing. Tachycardia and tachypnea were noticed. A wound was noticed on the left wing below the dorsal shoulder (Figure 1) and the fractured end of the

bone was found protruding out on close examination. Crepitus was also felt and she exhibited severe pain. No sign of any bruise, laceration or contusion were noticed elsewhere in the body. Radiographs confirmed an open, transverse, mid-diaphyseal fracture of the humerus with widely displaced fragments (Figure 2). In

appearance, the traumatic incident might have happened short while earlier.

Open surgical reduction and closure of wound was resorted to following pre-operative ceftriaxone (50 mg/kg) and ketoprofen (2 mg/kg) administration intramuscularly. General anesthesia was induced with ketamine hydrochloride (30 mg/kg), given intramuscularly. The feathers were plucked followed by debridement and lavage of wound with isotonic saline and then by 0.05% chlorhexidine after plugging the proximal fractured end with sterile cotton. In lateral recumbency, the site was aseptically prepared and draped. A 10.5 cm long, 3 mm Steinmann pin was driven in a retrograde fashion, directed proximally and was progressed distally, until it was seated on to the medial epicondylar epiphysis. The muscles were apposed with 3.5 metric polyglactin 910 by simple continuous suture pattern followed by the skin wound using 3.5 metric nylon in



Figure 1. Peahen with wound on the shoulder on presentation



Figure 2. Radiograph showing transverse, mid-shaft fracture of humerus

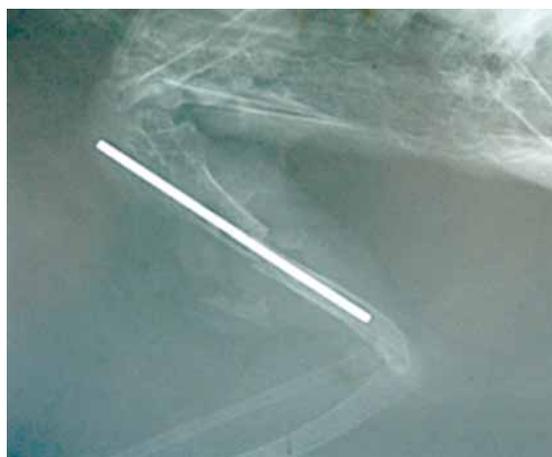


Figure 3. Radiographic check showing proper reduction

horizontal mattress pattern. Radiographic check showed accurately aligned pin along the reduced fragments (Figure 3). The operated wing was immobilized by figure-of-eight bandage with moderate flexion using non-adhesive bandage, stabilized by a body wrap. Post-operatively, antibiotics and analgesics were continued for 7 more days. Partially mutilated figure-of-eight bandage and the intact skin sutures were removed on the 14th post-operative day. Clinical signs of healing were noticed by third week and a stable callus was felt. Passive range-of-motion exercises and massage were also advised to be given twice daily.

RESULTS AND DISCUSSION

The fracture of wing bones are common in avian species as a result of impact injuries due to collision with branches, electric lines or other obstacles, either natural or anthropogenic (Roth and Jones, 2002 and Goody *et al.*, 2012). Previously, the fracture of tibia was reported in peafowl (Gahlot *et al.*, 2005). Though rarely reported in peafowl, generally, the humerus fractures in wild birds tend to be open and spiral with great displacement of fragments (Olsen *et al.*, 2000 and Redig, 2001). The cortices of avian long bones being thin and brittle, gets shattered on impact and the fragments may lacerate the skin resulting in open fractures. This might affect prognosis due to the greater likelihood of acquiring secondary bacterial infection and the associated complications

in addition to the limited soft tissue cover over the bones and the compromised blood supply in that region (Bennett and Kuzma, 1992; Redig, 2001 and Orosz, 2002).

The clinical presentation of the present case included wing droop and inability to fly which are non-specific signs of fracture and may occur with luxation and traumatic soft tissue or nerve injury (Orosz, 2002). Although the bone fragment was visible outside, the type of fracture and the extent of soft tissue damage could be determined only by radiography and the possibility of simultaneous luxation was also ruled out (Williams, 2002). Being an open fracture, whether to go for an open reduction and wound closure was controversial, despite immediate presentation (Bennett and Kuzma, 1992 and Orosz, 2002). However, debridement and lavage enabled wound healing and fracture union. Also, the prophylactic antibiotics helped to combat the possible generalized bacterial infection and the pre-operative and post-operative ketoprofen provided considerable analgesia throughout though, the proven opioid analgesics like butorphanol was readily unavailable to be administered (Pollock, 2002 and Coles, 2007).

The management of wing bone fractures requires stabilization of fragments, load sharing and adequate immobilization to enable better healing (Redig, 2001). Being a mid-shaft humerus fracture, figure-of-eight bandage alone may not be sufficient to stabilize the fracture site as experimentally shown using pigeon (*Columba livia*) models, which showed

complete displacement of the fragments when examined radiographically after 42 days (West *et al.*, 1996). Here, the internal fixation together with external coaptation accelerated the healing process. The intramedullary pin gained adequate alignment and helped to maintain the length of the bone, even though invasive. Also, considerable immobilisation could be achieved by figure-of-eight bandage and body wrap. This combination technique was also found to be successful in managing mid-diaphyseal transverse avian humerus fractures apart from the type 1 Kirschner-Ehmer splinting (McCoy, 1992). In an open transverse fracture, though external skeletal fixation was a better option, but finally refused as it might inflict self-trauma if the bird became fractious (Bennett and Kuzma, 1992).

The clinical signs of healing evidenced by a healthy callus and better usage of the stable operated wing for flight were noticed by the third week. In fact, if adequately stabilized and immobilized, the avian humeral fractures attain clinical stability by 3 weeks (Orosz, 2002). Passive range-of-motion exercises and massages helped to reduce the chances of joint ankylosis and muscular wasting associated with immobilisation and also maintained joint stability that has prior importance in flight birds (Bennett and Kuzma, 1992; Pollock, 2002 and Coles, 2007). Ketamine hydrochloride was used as the sole anesthetic agent in this case, administered at the rate of 30 mg/kg body weight, provided medium plane

of surgical anesthesia (Christensen *et al.*, 1987 and Athar *et al.*, 1996). Anesthesia lasted for about 25 minutes and the bird regained feet completely after 2 hours. Although the recovery was not smooth, it was uneventful.

The present case of wing bone fracture was found to be a rare report in a peafowl. A review radiograph could not be taken before it was released as it became difficult to restrain. However, it had an uneventful recovery without any complications.

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