



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2022; SP-11(7): 2517-2519  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 08-03-2022  
Accepted: 20-06-2022

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## Surgical management of compound Tibiotarsus fracture in parrot (*Psittacula krameri manillensis*)

**Amit Kumar, Sandeep Saharan, Dinesh, Deepak Kumar Tiwari and Neeraj Arora**

### Abstract

A 6 months old female parrot weighing 110 gram was presented to Veterinary Clinical Complex with a history of left limb injury due accidental fall from a tree. On presentation, the bird was unable to bear weight on left pelvic limb. During physical examination, a crepitus was felt on palpation at tibio-tarsal region with exteriorization of bone fragment. Radiographic examination confirmed a compound complete proximal third oblique fracture of left tibiotarsus. For stabilization of fractured fragments, an 18 gauge Orthopaedic wire was introduced intramedullary under general anesthesia. Immediate post-operative radiographs revealed appropriate approximation and reduction. Bird recovered uneventfully with complete weight bearing on affected limb and the wire was removed 8 weeks after surgery. In summary, it is concluded that an Orthopaedic wire can also be used as an intramedullary fixation in parrot's long bone fractures.

**Keywords:** Tibiotarsus, intramedullary, Orthopaedic wire

### Introduction

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. In addition, their much thinner cortices have implications for the holding power of fixation devices as it is widely accepted that bone thickness should be at least twice the thread pitch of a threaded implant for adequate stability. Avian bones are thin and brittle because of their high calcium content. Bones of birds have thin cortices that do not hold implant well and large medullary canals are difficult to fill without adding excessive weight to affected limb. Houston (1993) [5]. Stated that avian bones are thin, brittle and tend to break into fragments upon a variety of natural events like midair collisions, fights with other birds 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) [2].

Many a times the bones are small and the patient is fractious and prone to self-trauma. Avian fractures heal in the same manner as those in mammals (Bush, 1976) [1]. and the rate at which the bone heals is slightly faster than in mammals. The repair of avian fractures is difficult because of a large medullary cavity and thin cortices (Redig, 1986) [9]. Repair of fractures in wild birds often presents a significant challenge to the veterinary surgeon (Kumar *et al.*, 2012) [7]. Tibial fracture repair has been done in peacock using intramedullary pinning (Gahlot *et al.*, 2008) [3]. Kumar and co-workers had used fibreglass cast for immobilization of open, complete and transverse fracture of the proximal end of left tibial bone of emu. The present report describes a surgical management of a case of a compound tibiotarsus fracture in a parrot.

### Material and Methods

A six months old female parrot (*Psittacula krameri manillensis*) weighing 110 gram was brought to Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India having a history of accidental fall from tree. Left limb injury occurred and bird was unable to bear weight on affected limb (fig 1, 2). On presentation, parrot was not bearing weight on left pelvic limb. During physical examination, a crepitus was felt on palpation at left tibiotarsal region with exteriorization of bone fragments. Radiographic examination confirmed a compound complete proximal third oblique fracture of left tibiotarsus

(Fig. 3). Based on the clinical and radiographic findings, intramedullary fixation using 18 G orthopaedic wire was considered the best option performed for the treatment of fractured tibiotarsal bone. Meloxicam was injected intramuscularly (Melonex, Intas; @0.5 mg/kg body weight) to attain pre-emptive analgesia. Kamiloglu and co-workers (2008) [6] stated that intraosseous and intramuscular ketamine administration resulted in a satisfactory anaesthesia in pigeons. Ketamine was injected intramuscularly for sedation (20mg/kg body weight). The induction time recorded was 5 minutes. Then bird was restrained in left lateral recumbency and tibiotarsal region was prepared for aseptic surgery by plucking the feathers and applying the antiseptic solution containing chlorhexidine followed by povidone iodine painting. The general anaesthesia was maintained using inhalant anaesthetic agent (Isoflurane @ 2.5%) (fig. 4). Internal fixation was done by retrograde intramedullary using an 18 G orthopaedic wire (fig. 5). The extra wire was cut at the level of skin by a pin cutter after ensuring proper reduction and stabilization through radiograph. The muscles were sutured with chromic catgut (3/0) using interlocking pattern and skin suturing was done with Silk (3/0) using simple interrupted pattern. External immobilization was done by applying very light wooden stick wrapped in paper tape with soft light weighted bandaging. The parrot recovered from anaesthesia smoothly after 18 minutes of surgery. The owner was advised to restrict the movement of bird for minimum 12 days by keeping it in a medium sized aerated cardboard box.

Postoperatively, Meloxicam @ 5mg/kg body weight and Cefotaxime @ 75mg/kg body weight was given per orally for 7 days. Multivitamin syrup (Vimeral @ 5 to 6 drops in drinking water) was recommended for 10 days. Antiseptic

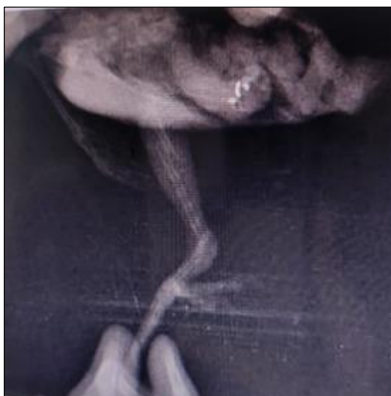
dressing of wound was done using liquid Betadiene solution (Povidone Iodine). The skin sutures were removed on 12<sup>th</sup> day postoperatively.

**Results and Discussion**

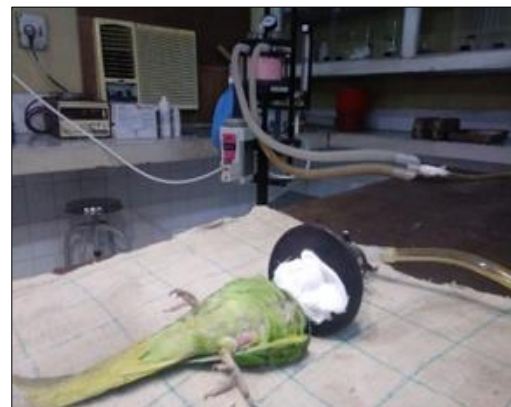
Tibio-tarsus bone is formed from a union of the tibia and the proximal row of tarsal bones during the embryonic growth. Tibiotarsal fractures are among the most common orthopedic problems encountered in raptors, especially in newly jessed hawks (Sanchez *et al.*, 2007) [10]. In present case, the bird started bearing weight on affected limb from 7<sup>th</sup> postoperative day. The postoperative follow-up radiograph after 3 months revealed complete healing of fractured bone (Fig. 7). The majority of the callus tissue during healing is derived from the periosteal surface, and the blood supply to the periosteum from surrounding soft tissues is very important and the intramedullary circulation appears to be of less significance in avian bone healing than in mammals (West, 1996) [13]. as the healing in birds is faster than in mammals. The bird recovered uneventfully with complete weight bearing on affected limb (fig. 8) and the orthopaedic wire was removed 8 weeks after surgery. A number of standard orthopaedic procedures have been used for management of fracture in wild birds like eagle and kites. (Guzman *et al.*, 2007; Manjulkar *et al.*, 2008) [4, 8]. Intraosseous and intramuscular ketamine administration results in a satisfactory anaesthesia in pigeons (Kamiloglu *et al.*, 2008) [6]. In present case, intramuscular administration of ketamine was found to be effective and safe. Intramedullary pinning under ketamine anesthesia is safe technique to repair tibio-tarsal fracture in pigeons (Verma *et al.*, 2018) [12]. Transverse fracture of tibiotarsus in goose was repaired successfully by using intramedullary pin without any complications (Suryawanshi *et al.*, 2021) [11].



**Fig 1, 2:** Showing affected left limb (Not bearing weight on left Limb)



**Fig 3:** Compound complete proximal third oblique fracture of left tibia



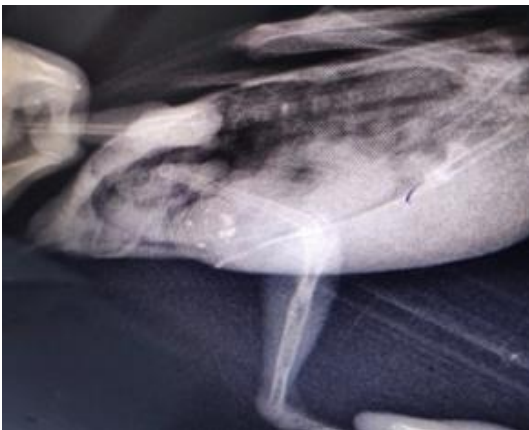
**Fig 4:** Maintenance of anaesthesia



**Fig 5:** 18 gauge Orthopaedic wire insertion



**Fig 6:** Immediate post-operative radiographs showing appropriate approximation and reduction



**Fig 7:** The post-operative follow-up radiograph after 3 months showing complete bone union



**Fig 8:** Parrot showing complete weight bearing on left limb

## Conclusions

In conclusion, intramedullary pinning using orthopaedic wire is a successful technique for the repair of tibiotarsal fracture in parrots.

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