CASE REPORT

Repair of Compound Tibiotarsus Fracture using Intramedullary Pinning in a Pigeon

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Tibio-tarsus bone is formed from a union of the tibia and the proximal row of tarsal bones during the embryonic growth (Suryawanshi *et al.*, 2021). The biggest leg bone in birds, the tibiotarsus, is usually twice as long as the femur (Sreeranjini *et al.,* 2013). The mineral content of avian bones is somewhat higher than that of human bones, which leads to an increased incidence of open fractures that are comminuted and include many sharp pieces that can be traumatic to the soft tissues that are surrounding the bone (Kumar *et al.,* 2022). The frequent occurrence of fractures is attributed to the thin skin and comparatively low muscle mass that surround the bone. According to Wright *et al.* (2018), the mid-diaphyseal section accounts for the majority of tibiotarsal fractures, which account for 53% of cases. The proximal third and distal third of the tibiotarsal diaphysis are the sites of 22% and 13% of fractures, respectively. Wright *et al.* (2018) claimed that tibiotarsal fractures were frequently caused by a range of circumstances, such as maltreatment by the owner (22%), dropping from a perch (9%), and trauma triggered by an attack by a dog or cat (7%). Nevertheless, the etiology of the tibiotarsal fracture was not specified in 47% of the cases. According to Verma *et al.* (2018), avian fractures can be the result of either natural events, such as mid-air collisions or scuffles with other birds, or anthropogenic experiences, such as gunshot wounds, collisions with automobiles or fences, entrapment, or attacks by canines or cats. In both captive and untamed birds, bone fractures were a common occurrence. The current report delineates the successful surgical treatment of a compound tibiotarsus fracture in a pigeon through the use of intramedullary fixation with orthopaedic wire.

Case History and Observations

A one year old pigeon weighing 262 gram was brought to Veterinary Clinical Complex, College of Veterinary Science, Rampura Phul, GADVASU, Bathinda (India) having a history of accidental fall from the roof. Right hind limb injury occurred and bird was unable to bear weight on affected limb. On presentation, bird was not bearing weight on right pelvic limb. During physical examination, a crepitus was felt on palpation at right tibiotarsal region with exteriorization of bone fragments (Fig. 1). Haemato-biochemical analysis of blood collected from wing vein of the bird was within normal range. Radiographic examination confirmed a compound complete distal third oblique fracture of right tibiotarsus (Fig. 2). 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.

Treatment and Discussion

Surgery was performed under general anaesthesia using inhalant anaesthetic agent (Isoflurane @ 2.5%). The bird was restrained in dorsal recumbency and right tibiotarsal region was prepared for aseptic surgery by plucking the feathers and applying the antiseptic solution containing povidone iodine solution. Internal fixation was done by retrograde intramedullary using an 18 G orthopaedic wire. The muscles

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Fig. 1: Showing compound fracture of right tibiotarsus



Fig. 2: Pre-operative radiograph showing complete transverse distal third fracture of right tibiotarsus bone.





Fig. 3: Showing intramedullary pinning and routine suturing



Fig. 4: Immediate post-operative picture showing external immobilization

were sutured with Vicryl No. (3/0) using simple continuous pattern and skin suturing was done with Nylon (2/0) using simple interrupted pattern (Fig. 3). External immobilization was done by applying very light plastic stick wrapped in paper tape with soft light weighted bandaging (Fig. 4) The piegon recovered from anaesthesia smoothly after surgery. The owner was advised to restrict the movement of bird by keeping it in a medium sized aerated cardboard box. Postoperatively, Meloxicam @ 0.5 mg/kg body weight and Cefpodoxime proxitel @ 25 mg/kg body weight was given per orally for 5 days. Multivitamin syrup (Birdplus @ 4 to 5 drops in drinking water) was recommended for 12 days. Antiseptic dressing of wound was done using liquid Betadiene solution (Povidone Iodine).

Immediate post-operative radiographs revealed appropriate approximation and reduction (Fig. 5). At the tenth postoperative day, the bird initiated weight bearing on the operated limb (Fig. 6). The skin sutures were removed on the 15th day following the operation. After two months, the post-operative follow-up radiograph demonstrated that the fractured bone had fully healed (Fig. 7) and orthorpaedic wire was removed after 8th post-operative week (Fig. 8). The bird recovered unscathed with complete weight bearing on the affected limb.

The periosteal surface is the source of the majority of the callus tissue during the healing process. The blood supply to the periosteum from the surrounding soft tissues is crucial. According to Kumar *et al.* (2022), the intramedullary circulation appears to be of less importance in avian bone healing than in mammals, as birds heal at a faster rate. In general, birds exhibit a faster recovery process than other animals, and the bones typically repair adequately after 3-4 weeks of care (Pal *et al.,* 2025). The normal haemato-biochemical readings noted initially were consistently within the normal reference range, as reported by Suryawanshi *et al.* (2021). The orthopaedic wire removed 8 weeks after the surgery with complete cure of the pigeon was in line with Kumar *et al.* (2022). Several scientific researchers have employed a variety of standard orthopaedic techniques to



Fig. 5: Immediate post-operative radiograph showing proper anatomical approximation and alignment.



Fig. 6: Showing weight bearing of operated limb at 10th post-operative day



Fig. 7: Radiograph showing complete bone healing at 8th post-operative week

manage fractures in wild birds, such as eagles and kites, with varying outcomes (Guzman *et al.,* 2007; Manjulkar *et al.,* 2008; Suryawanshi *et al.,* 2021). Gahlot (2008) previously reported the use of intramedullary fixation to repair a tibial fracture in a peacock. Nevertheless, the present case study confirms that the provision of internal fixation in conjunction with external fixation procedures resulted in superior fracture management outcomes (Azmanis *et al.,* 2014). In order to regulate rotation forces in birds, internal fixation and external coaptation are also necessary (Peter and Patrick, 2013). After reviewing the contents and procedures, it was evident that the utilization of sterile orthopaedic wire for intramedullary pinning in accordance with the size is a successful technique and a prospective alternative to other internal fixation devices for the repair of tibio-tarsus fractures in pigeons.



Fig. 8: Showing removal orthopaedic wire at 8th post-operative week and removed orthopaedic wire

In brief, the present case illustrates the successful treatment approach of intramedullary pinning to restore a compound tibiotarsus fracture in a pigeon using orthopedic wire fixation. The technique facilitated the restoration of limb function, promoted satisfactory healing, and provided adequate fracture stabilization. Consequently, the utilization of orthopedic wires was beneficial in the management of fractures in pigeons.

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