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**AR Ninu**

Department of Veterinary  
Surgery and Radiology,  
Veterinary College and Research  
Institute, Tirunelveli, Tamil  
Nadu Veterinary and Animal  
Sciences University, Tamil  
Nadu, India

**N Krishnaveni**

Department of Veterinary  
Surgery and Radiology,  
Veterinary College and Research  
Institute, Tirunelveli, Tamil  
Nadu Veterinary and Animal  
Sciences University, Tamil  
Nadu, India

**Corresponding Author:**

**AR Ninu**

Department of Veterinary  
Surgery and Radiology,  
Veterinary College and Research  
Institute, Tirunelveli, Tamil  
Nadu Veterinary and Animal  
Sciences University, Tamil  
Nadu, India

## Tibiotarsal fracture repair in a duckling using a spinal needle

**AR Ninu and N Krishnaveni**

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### Abstract

A 5-month old female duckling weighing 300 g was brought with a history of non-weight bearing lameness in the right foot. History suggested a possible stone pelting. Clinical examination revealed deformity, muscle damage and crepitation in the distal tibiotarsal region. X-ray revealed, distal third tibiotarsal transverse fracture. Under ketamine induction and isoflurane maintenance, normograde intramedullary pinning was done with a 20 G sterile spinal needle. There was no post-operative complication and normal weight bearing was regained in 2 weeks.

**Keywords:** Duckling, intramedullary pinning, tibiotarsal fracture, spinal needle

### Introduction

Tibiotarsal fractures are common in birds since it is long and more exposed bone (Wright *et al.*, 2018) [7]. Transverse fractures are most common. Thin cortices of bird bones may predispose them to easily shatter during drilling. Only normograde pinning is advisable in tibiotarsal fractures. External skeletal fixation may need drilling the bone at multiple sites which may predispose to shattering. The muscle damage at the site also was another reason for choosing an intramedullary fixation technique. Tape splints, external skeletal fixation and interlocking nail were used for repair of tibiotarsal fractures in birds.

### History and Clinical findings

A 5-month old female duckling weighing 300 g was brought with a history of non-weight bearing lameness in the right foot. History suggested a possible stone attack. Clinical examination revealed deformity, muscle damage and crepitation in the distal tibiotarsal region. X-ray revealed, distal third tibiotarsal transverse fracture.

### Materials and Methods

Under ketamine (@ 20 mg/kg b. wt. i/m) induction and isoflurane (0.8%) in 100% oxygen maintenance @ 1 L/minute, normograde intramedullary pinning was done with a 20 G sterile spinal needle. The spinal needle was introduced into the cranial aspect of proximal right tibiotarsus and advanced into the distal fragment after reduction of the fracture fragments. This could be easily done by the grasping the hub of the spinal needle rather than using a chuck under C-arm. Following the procedure, a soft cotton bandage was applied to protect the intramedullary pin. Follow up treatment included oral Enrofloxacin @ 10 mg/kg b. wt. once daily for 7 days and Meloxicam @ 1 mg/kg b. wt. once daily for three days along with daily wound dressings.

### Results and Discussion

The adopted approaches to repair tibiotarsal fracture in avian species are splints, casts, bone plates, external fixator, intramedullary pinning, circlage and hybrid combination of these methods, depending upon the type of fracture and condition of bone and animal health status. Splints are difficult to apply and manage bone because of soft tissue and musculature. (Kavanagh, 1997; Helmer and Redig, 2006; Duer, 2010; Carrasco, 2019; Fernandes *et al.*, 2021) [5, 4, 2, 1, 3].

Use of intramedullary pin alone may lead to rotation of the pin, but combined with external coaptation it will provide stability as in our case. The presence of the hub necessitated proper grip and accurate pressure while inserting the spinal needle. The duckling was able to bear weight in the right foot after 2 weeks. The pin was removed after 20 days. Owner reported that the duck is now actively moving around with proper weight bearing in the affected limb.



**Fig 1:** The duckling on the day of presentation



**Fig 2:** Fracture immobilization with spinal needle



**Fig 3:** Post-operatively after 4 months-normal weight bearing in the right foot

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### Conclusions

Tibiotarsal fractures are common in birds, especially transverse fractures due to their long and exposed bones. Thin cortices can lead to shattering during drilling, making normograde pinning the preferred method for these fractures. In a 5-month-old duckling, a transverse tibiotarsal fracture was successfully treated with intramedullary pinning using a 20G spinal needle. This method provided stability and allowed for weight-bearing within two weeks. The pin was removed after 20 days, and the duckling showed full recovery with proper weight-bearing. This case highlights the effectiveness of normograde intramedullary pinning in avian tibiotarsal fractures.

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