International Journal of Global Science Research
Vol. 12, Issue. 2, October 2025, pp. 2693-2696
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: https://doi.org/10.26540/ijgsr.v12.i2.2025.312

Research paper

Hanging Pin Cast Application in a Buffalo Calf with Tibial Fracture as Clinico-Anatomical Approach: A Clinical Case Report

Meenakshi Singh[1], Ratnesh Kumar Chaudhary[2]*, Aditya Kumar[3], Divyanshi Singh[4], Deepak Nehera[5] and Rupam Sinha[6]

[1,4,5&6]College of Veterinary Science and Animal Husbandry, U.P. Pt. Deen Dayal Upadhyaya Veterinary Science University and Cattle Research Institute, Mathura, Uttar Pradesh, India.
[2]*Department of Veterinary Anatomy, Bihar Animal Science University, Panta, Bihar, India
[3]Department of Veterinary Anatomy, Rani Laxmi Bai Central Agriculture University, Jhansi, Uttar Pradesh, India
*Corresponding Author Email: dr.ratneshchoudhary@gmail.com

Received: 07/07/2025
Revised: 14/07/2025
Accepted: 30/07/2025

Abstract: Fractures of long bones, especially in growing calves, are a common occurrence in field veterinary practice. Among these, tibial fractures are of significant concern due to the bone's structural importance in bearing weight. This case report presents the diagnosis, management, and successful recovery of a six-month-old female Murrah buffalo calf with a mid-shaft fracture of the left tibia. The hanging pin cast technique was utilized to provide effective external immobilization. Ancillary medical therapy, supportive care, and nutritional supplementation contributed significantly to the overall recovery. This conservative yet efficient technique is particularly suitable in rural or resource-limited settings.

Keywords: Buffalo calf, Tibial fracture, Hanging pin cast, External immobilization, Orthopedic management

Introduction:

Orthopedic injuries, particularly long bone fractures, are frequently encountered in calves due to accidental trauma, rough handling, or slippery flooring. The tibia, being a straight, weight-bearing bone with relatively little muscular coverage, is prone to traumatic injuries, especially in young and active animals. The management of tibial fractures in calves presents unique challenges due to the animal's size, cost constraints, and the limited availability of surgical facilities in field settings (Tyagi and Singh, 2010). While internal fixation methods such as plating or intramedullary pinning are considered ideal in small animals and humans, these procedures are often impractical or uneconomical in large ruminants. Therefore, external coaptation methods like casting, Thomas splint, or hanging pin cast are preferred (Turner, and McIlwraith, 2013). The hanging pin cast technique is minimally invasive, economical, and allows partial limb suspension, which reduces weight bearing on the fractured limb, promoting better alignment and healing (Aithal *et. al.* 2003, Amarpal *et. al.*, 2002; Maiti *et. al.*, 2005). This case report highlights the clinical approach, technique, and outcome of managing a tibial fracture in a buffalo calf using a

International Journal of Global Science Research
Vol. 12, Issue. 2, October 2025, pp. 2693-2696
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: https://doi.org/10.26540/ijgsr.v12.i2.2025.312

hanging pin cast, supported by medical and nutritional therapy.

Figure: 1. A six-month-old female Murrah buffalo calf was presented to the Teaching Veterinary Clinical Complex (TVCC)

Case History and Presentation

A six-month-old female Murrah buffalo calf was presented to the Teaching Veterinary Clinical Complex (TVCC) with a history of left hind limb lameness for two days. The owner, Mr. Vinay Singh of Kundaban, Sultanpur (U.P.), reported that the calf sustained the injury while walking on uneven terrain. The animal had been initially treated by a local veterinarian with injections of meloxicam and ceftriaxone, with no improvement in the weight-bearing capacity of the affected limb. On physical examination, the calf was alert and responsive. The vital parameters were within normal physiological limits: rectal temperature was recorded at 99.9°F, heart rate was 124 beats per minute, and respiratory rate was 40 breaths per minute. The mucous membranes were pink, and capillary refill time was less than two seconds. Defecation and urination were normal. Orthopaedic examination revealed abnormal mobility, crepitus, and swelling at the mid-shaft of the left tibia, indicating a complete transverse fracture. (Fig.1)

Laboratory Findings

Haematological analysis was conducted to assess the animal's systemic condition prior to the orthopaedic procedure. The haemoglobin level was 10.5 g/dL, packed cell volume was 28%, and red blood cell count was 6 million per microliter. Mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), and mean corpuscular haemoglobin concentration (MCHC) were recorded at 98 fl, 16 pg, and 32 g/dL, respectively. The white blood cell count was 9600 per microliter, with a differential count showing neutrophils at 36%, lymphocytes at 59%, monocytes at 6%, eosinophils at 2%, and basophils at 1%. Platelet count was estimated at 2.5 lakh per microliter. These values were within or close to the physiological ranges, suggesting the animal was fit for orthopaedic intervention.

International Journal of Global Science Research
Vol. 12, Issue. 2, October 2025, pp. 2693-2696
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: https://doi.org/10.26540/ijgsr.v12.i2.2025.312

Treatment and Immobilization Technique

Considering the fracture's location and the calf's age, a hanging pin cast was chosen for immobilization. Under aseptic precautions and sedation, a Steinmann pin was transversely inserted through the distal femur to allow suspension Figure 2. A fiberglass cast was then applied from the hoof to just below the stifle joint. Adequate padding was provided to prevent pressure injuries. The cast was suspended with the help of the pin, enabling reduced weight-bearing and better healing alignment.

Figure: 2. A six month-old female Murrah buffalo calf with steps of treatment with immobilization

The medical treatment protocol included intramuscular administration of dicrysticin (2.5 gm once daily for five days), meloxicam (30 ml @ 7 ml IM once daily for three days), and a multivitamin preparation (Tribivet, 30 ml @ 7 ml IM once daily for three days). Oral supplementation included calcium and vitamin D3 syrup (Osteovit and Vimorol, 20 ml each daily for 30 days), and a mineral mixture with herbal bone stimulant (Sankalp 20 g + Arthonil Hi-Dense 10 g twice daily for 30 days). The owner was advised to maintain strict stall rest and prevent movement of the calf for a minimum of 90–95 days.

Discussion:

The hanging pin cast method is a time-tested external immobilization technique, particularly suitable for managing mid-diaphyseal fractures in large animals. Its advantages include ease of application, cost-effectiveness, and minimal surgical invasion, which is important in field conditions. The suspension of the limb through the pin reduces pressure on the fracture site and helps maintain proper alignment without requiring full weight-bearing by the animal (Saini *et al.*, 2004). The healing of fractures in young calves is typically rapid due to high bone turnover and regenerative capacity. However, complications such as muscle atrophy, joint stiffness, or cast-related injuries must be vigilantly monitored. In this case, the early diagnosis, effective immobilization, and concurrent nutritional support facilitated a smooth recovery process. The use of supportive therapy, including calcium, vitamin D3, and herbal bone enhancers, plays a critical role in promoting osteogenesis and minimizing healing time. Haematological parameters provided a baseline for monitoring systemic health and detecting any early signs of infection or inflammatory complications.

Conclusion:

This case successfully demonstrates that hanging pin cast application is a reliable, cost-effective, and field-friendly technique for managing tibial fractures in calves. With proper animal restraint, aseptic application, and supportive therapy, excellent functional recovery can be achieved without surgical intervention. This technique continues to be a practical solution in veterinary orthopaedics, especially in rural areas where advanced surgical resources may not be available.

References:

Tyagi, R. P. S. and Singh, J. (2010) *Ruminant surgery* (11th ed.) CBS Publishers & Distributors Pvt. Ltd.

Turner, A. S. and McIlwraith, C. W. (2013) *Techniques in large animal surgery* (4th ed.). Wiley-Blackwell.

ISSN: 2348-8344 (Online)
DOI: https://doi.org/10.26540/ijgsr.v12.i2.2025.312

Aithal, H. P., Singh, G. R., Hoque, M. and Amarpal. (2003) External skeletal fixation for the management of long bone fractures in bovines. Indian Journal of Veterinary Surgery, 24(1), 1–5.

Amarpal, Aithal, H. P. and Singh, G. R. (2002) External skeletal fixation in the management of long bone fractures in calves. Indian Journal of Animal Sciences, 72(12), 1091–1095.

Maiti, S. K., Patra, R. C. and Das, B. C. (2005) Use of external fixator for immobilization of tibial fractures in calves. Indian Veterinary Journal, 82(1), 64–66.

Saini, N. S., Singh, G. R. and Uppal, S. K. (2004) Management of fractures in field conditions. Indian Journal of Field Veterinarians, 1(4), 27–30.