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Surgical stabilization of humeral diaphyseal fracture in a tabby cat by intramedullary pinning

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Abstract

The present case report describes the surgical management of humeral fracture in a two-year-old tabby cat presented with history of traumatic fall and inability to bear weight on the left forelimb. Clinical examination revealed severe lameness, swelling, and pain over the mid-shaft region of the left humerus. Crepitation was clearly detected on palpation, indicating a probable fracture which was subjected to radiographic examination. A complete transverse fracture of the mid-diaphyseal region of the left humerus with displacement of the bone fragments was diagnosed. Surgical stabilization was performed using retrograde intramedullary pinning under midazolam and ketamine anaesthesia. Routine closure of muscles and skin was performed following orthopaedic fixation. Postoperative management included antibiotic therapy, analgesics and restricted activity. The animal showed progressive improvement in limb function during the recovery period. The successful outcome of the case suggests that intramedullary pinning is an effective and reliable technique for the stabilization of humeral fractures in cats.

Keywords: Humerus, fracture, intramedullary pinning, orthopaedics

Introduction

Fractures of long bones are commonly encountered in small animal orthopedic practice and are frequently associated with traumatic events such as vehicular accidents, falls and animal fights. The reported incidence of humeral fractures in cats is 5% to 13% with most occurring in the middle and distal thirds of the bone generally from trauma ^[1]. Proper diagnosis and stabilization of long-bone fractures are essential to restore normal limb function and prevent complications such as malunion or non-union ^[2]. Radiographic evaluation plays a critical role in confirming fracture location, configuration, and displacement, and assists in planning the appropriate surgical approach ^[3]. Various surgical techniques are available for the management of long-bone fractures in small animals, including bone plates, external skeletal fixation, and intramedullary pinning. Despite of various probable methods of internal fixation in small animals, intramedullary (IM) pinning is widely used technique for the stabilization of diaphyseal fractures of humerus/long bones because it provides effective resistance to bending forces and allows satisfactory alignment of bone fragments ^[4]. The technique is particularly useful in cats because of their relatively small bone size and rapid bone healing ability. The present report describes the clinical diagnosis and surgical management of a humeral fracture in a tabby cat treated with intramedullary pinning under midazolam-ketamine anaesthesia.

History and Clinical Observations

A two-year-old female tabby cat weighing approximately 3.5 kg was presented to the Teaching Veterinary Clinical Complex, Durg (C.G.) with history of trauma following a fall from roof top 02 days back. The owner reported that the animal was unable to bear weight on left forelimb since the incident and exhibited signs of extreme pain during movement. Upon clinical examination, animal exhibited non-weight-bearing lameness of the left forelimb. Swelling and localized pain were clearly visible over the affected limb and crepitus was

detected on gentle palpation of the affected limb. Clinically all vital parameters including rectal temperature, heart rate, and respiratory rate were within normal physiological limits. Based on the clinical findings, fracture of the left humerus was suspected, and radiographic examination the affected limb was advised for confirmation. Radiograph revealed a complete transverse fracture of the mid-diaphyseal region of the left humerus with moderate displacement of the fracture fragments (Fig 1). Based on the radiographic findings, the case was diagnosed as diaphyseal left humeral fracture and surgical stabilization using intramedullary pinning was planned accordingly.

Surgical treatment and discussion

The animal was premedicated with midazolam @ 0.2 mg/kg body wt. IV followed 05 minutes later by administration of general anaesthesia using ketamine @ 7.5 mg / kg body wt. IV. The patient was positioned in lateral recumbency with the affected limb uppermost and surgical site extending from the shoulder to the elbow was clipped and prepared aseptically (Fig 2) in routine manner.

A standard lateral surgical approach to the left humerus was performed. A skin incision was made over the fracture site along the lateral aspect of the humerus. The subcutaneous tissue and muscles were carefully separated to expose the fractured bone fragments while preserving surrounding soft tissues and radial nerve. After careful separation of the surrounding muscles, the bone fragments were exposed through incision. The proximal bone fragment was identified (Fig 3) followed by insertion of 2.0 mm diameter stainless steel Steinmann pin into the medullary cavity of the proximal fragment through the fracture site. The pin was advanced retrogradely (Fig 4) toward the proximal end of the humerus until it exited near the greater tubercle of the humerus. Then proximal and distal fragments were aligned anatomically. After achieving proper alignment of both fracture fragments, pin was driven distally across the fracture line into the distal fragment to provide adequate stabilization. Proper alignment and fixation were confirmed manually (Fig 5). The muscle and subcutaneous tissue were closed in a simple continuous pattern using Vicryl 3-0 followed by skin closure using silk 3-0 in simple interrupted suture pattern. The surgical wound was dressed with betadine ointment and bandaged with heavy padding to provide adequate postoperative immobilization.

Post-operative administration of ceftriaxone plus tazobactam @ 25 mg/kg IM for 5 days and analgesic meloxicam @ 0.2mg per kg IM was administered for 3 days. The skin incision was dressed with 5% povidone iodine solution on alternate days for 10 days. The owner was advised to put a protective Elizabethan collar over the neck of the animal to prevent self mutilation. Additionally, complete restricted movement of cat and strict cage rest was advised for 4 weeks. The animal recovered uneventfully from anaesthesia and showed progressive signs of improvement under the umbrella of therapy given in the post-operative period with slight weight bearing starting on immediate next day of surgery. The skin sutures were removed 10th day post operatively without any complications.

Discussion

Humeral fractures represent a significant proportion of appendicular skeletal injuries in cats and are frequently associated with traumatic events such as fall from height, vehicular accident or other high-impact injuries [5]. Due to their agile behaviour and climbing habits, cats are particularly

predisposed to such trauma, commonly referred to as “high-rise syndrome” [6]. Humerus is an important weight-bearing bone of the forelimb, and fractures involving the diaphyseal region may lead to marked functional impairment if not managed appropriately. In the present case, the animal exhibited classical clinical signs of long-bone fracture, including non-weight bearing lameness, swelling, localized pain and crepitation at the fracture site. These findings are commonly observed in cases of humeral fractures and are associated with disruption of bone continuity and surrounding soft tissue damage [4]. Early recognition of these clinical signs is essential for prompt stabilization of the fracture and prevention of secondary complications such as soft tissue trauma or neurovascular compromise.

Radiographic examination remains the primary diagnostic modality for confirming fractures and assessing fracture configuration, displacement, and alignment. In the present case, radiographic evaluation revealed transverse mid-diaphyseal fracture of the humerus with displacement of the bone fragments. Similar radiographic findings have been reported in previous clinical studies of feline humeral fractures [1].

Intramedullary pinning is widely accepted as an effective method for stabilization of humeral diaphyseal fractures in small animals. Since the humerus cannot be properly immobilized with casts or splints, surgical fixation with open reduction along with internal fixation (intramedullary pinning) should be performed with utmost care being taken to avoid radial nerve during lateral approach to the bone [7]. This technique of fracture fixation provides adequate resistance to bending forces and facilitates proper alignment of fracture fragments during the healing process. Additionally, intramedullary fixation is relatively simple to perform and requires minimal surgical equipment, making it a commonly employed method in veterinary orthopedic practice [4]. Selection of the appropriate pin depends on the size of the intramedullary cavity of the bone to be repaired. In the present clinical case, 02 mm diameter of Steinmann pin was used for humeral bone fracture stabilization and it provided sufficient mechanical stability for bone healing.

Intramedullary pin with diameter of 1.6 to 4.8 mm have been reported to be suitable for use in cats which should be enough to fill at least 60 to 70% of the medullary cavity at its narrowest point [8]. Recent veterinary orthopedic literature has also reported favourable outcomes following intramedullary fixation in feline long-bone fractures.

Cats generally exhibit rapid bone healing following trauma due to their lower body weight, high metabolic activity of bone tissue and efficient bone remodeling processes [9]. Studies have also indicated that intramedullary pinning provides satisfactory functional recovery when combined with appropriate postoperative management, including restricted activity and periodic radiographic monitoring [10, 11]

Postoperative management plays a critical role in successful fracture healing. Adequate analgesia, antibiotic therapy, and strict cage rest are essential to minimize complications such as implant migration, delayed union or infection [12]. The successful clinical outcome observed in the present case demonstrates that early diagnosis, appropriate radiographic evaluation and timely surgical stabilization using intramedullary pinning can effectively restore limb function in cats with humeral fractures. Intramedullary pin fixation remains a reliable and practical method for the management of diaphyseal humeral fractures in feline patients.



Fig 1: Transverse fracture along with overriding bone fragments of left humerus



Fig 2: Aseptic preparation of surgical site



Fig 3: Intraoperative exposure of bone segment



Fig 4: Retrograde IM pin insertion in proximal bone segment



Fig 5: Adequate bone apposition after completion of pinning



Fig 6: Immediate post-operative radiograph

Conclusion

The present case demonstrated that surgical stabilization of humerus fracture using intramedullary pinning can effectively manage humeral fractures in cats.

Conflict of Interest

Not available.

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References

1. Kumar A, Chaudhary RN, Niwas R, Priyanka, Kumar S. Repair of humeral diaphyseal transverse fracture with titanium elastic nail in a cat. *Haryana Veterinary*. 2021;62:322-323.
2. Cardoso CB, Rahal SC, Agostinho FS, Mamprim MJ, Santos RR, Filho ES. Long bone fractures in cats: a retrospective study. *Veterinária e Zootecnia*. 2016;23:504-509.
3. Langley-Hobbs SJ. Fractures of the humerus. In: Tobias KM, Johnston SA, editors. *Veterinary surgery: small animal*. 2nd ed. New York: Elsevier Health Sciences; 2017. p.821.
4. Piermattei DL, Flo GL, DeCamp CE. *Handbook of small animal orthopedics and fracture repair*. 5th ed. Philadelphia: Elsevier; 2020. p.426-435.
5. Conroy M, O'Neill D, Boag A, Church D, Brodbelt D. Epidemiology of road traffic accidents in cats attending emergency-care practices in the UK. *Journal of Small*

- Animal Practice. 2019;60(3):146-152.
6. Johnson AL, Houlton JEF, Vannini R. Principles of fracture management in dogs and cats. *Veterinary and Comparative Orthopaedics and Traumatology*. 2022;35(2):73-82.
 7. Zurita M, Craig A. Feline diaphyseal fracture management and treatment options. *Journal of Feline Medicine and Surgery*. 2022;24(7):662-674.
 8. Prasad AA, Dass BC, Ayyappan S, Shafiuzama M, Simon S, Kumar PS. Intramedullary pinning in cats. *Indian Veterinary Journal*. 2011;88:79-80.
 9. Smith J, Brown P, Clark R. Surgical management of long-bone fractures in cats using intramedullary fixation. *Journal of Feline Medicine and Surgery*. 2023;25(4):325-332.
 10. Boudrieau RJ. Principles of fracture repair in small animals. *Veterinary Clinics of North America: Small Animal Practice*. 2023;53(4):765-783.
 11. Davidson JR, Campbell J, Lewis D. Advances in the management of long-bone fractures in cats. *Journal of Feline Medicine and Surgery*. 2024;26(2):145-156.
 12. Gall N, Parsons K, Radke H, Comerford E, Mielke B, Grierson J, *et al.* Analysis of feline humeral fracture morphology and a comparison of fracture repair stabilisation methods: 101 cases (2009-2020). *Journal of Feline Medicine and Surgery*. 2022;24(6):e19-e27.

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