A report on femoral fracture management using intramedullary pinning at SAQTVH, CVASU.

A CLINICAL REPORT SUBMITTED

BY

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Abstract

Femur bone fractures are common to all feline fractures and the femur is one of the most commonly fractured bones in dogs and cats following substantial trauma. The present case study describe the outcome of the femur fracture management in cat.The Case is an eight month old intact male indigenous cat weighing 2.8kg,history of limping in right hind limbs since 2 days were brought to Teaching Veterinary Hospital, Chittagong Veterinary and Animal Sciences University (CVASU) . Clinical examination revealed the cats was active and alert but mild weight bearing, limping, pain and crepitation also noticed in affected limb. Radiographic examination confirmed that right distal diaphyseal transverse femur fracture .On the basis of fracture patient assessment score (FPAS), the cases were decided for internal fixation by an intramedullary pinning. Retrograde intramedullary pinning with standard surgical approach and xylazine and ketamine anesthesia were done . Postoperatively catwas managed by systemicantibiotic and pain killer with protective bandages were applied. Mild weight bearing was observed at the 7th postoperative (PO) day and sutures were removed on the day without any wound complications. Postoperative the 18th days, improved weight ware observed clinically and secondary bone healing was noticed on radiographic examination. Pin migration and mild seroma was noticed on PO 3rd weeks. PO 4 months bone remodeling was noticed and patients maintained a comfortable life and owners were also very happy. The present case study suggest theintramedullary pinning is an easy, economic and field based effective method for internal femur fracture fixation in cat.

Keywords: Cat, Surgical management, Femur fracture and Retrograde intramedullary pinning (IMP)

Chapter 1: Introduction

Femur bone fractures are common to small animals takes place in the hind limbs,femur and humerus fracture is one of the most common orthopaedic affections met in cat(Voss., 2009). The maximum incidence of fracture in femur prone due to exposure to hind quarters of the major force of impact. This was in accordance in (Harasen., 2004) conditional on loading forces to the bone is acquiesced, such as compression, bending, tension will occur unique fracture patterns (Johnson., 2007). Fractures in cats somewhat analogous to fractures in dogs. The femur was the most affected bone (50.84%) then other bone in cat. (Cardoso., 2016). femur fractures are usually not acquiescent to conformist repair and internal fixation is required (Beale., 2004) .Fixation methods embrace external coaptation, IMP (single pin, stacked pins), cerclage wire, external skeletal fixation with IMP, bone plates, lag screw, plate rod and interlocking nails (Scott, 2005; Scott and Mclaughlin., 2007). IMP is a popular method of long bone fracture repair in cats, often used to stabilize fracture of the humerus, femur and tibia.The effective surgical repair of oblique over riding diaphyseal femoral facture in cat (Simon., 2016) The present study describe the outcome of an intramedullary pinning technique in a cat.

Chapter 2

2.1. Case Presentation

An eight month old indigenous male cat weighing 2.8 kg was admitted to Teaching Veterinary Hospital, CVASU with the history of fall down and got pain on limb. limping in right hind limbs in cat since 2 days. Clinical examination revealed that the cat was active and alert but mild weight bearing in right hind limb, pain and crepitation also noticed in affected limb. Blood parameters revealed normal values. Radiographic examination of the cat confirmed the right distal transverse femoral fracture hence the cases were decided for internal fixation by IMP.

2.2.Restraining,Anesthesia and Surgical Technique

Food was withheld for 8 hours before surgery and the cat was allowed to take water up to 2 hours prior to surgery.(Simon.,2016). For the cat: anesthesia was done by xylazine (1.0mg/kg body weight) and ketamine (10.0 mg/kg body weight) mixture by intramuscular route(Arun et al., 2011). All cases retrograde IMP was performed by the standard Cranio-lateral approach by using 2.5mm Steinmann pin. Postoperatively, cat were managed by systemic antibiotic, antihistaminic and pain killer with protective bandage and restricted movement for one week.

2.3. Post-operative care

The cat was monitored for 5 days to observe any complication until complete healing. Following surgery ,the cat was supplied fluid replacements, antibiotic (ceftriaxone) and anti-inflammatory drugs (Meloxicam) for 5 days. Calcium supplement (Calbo-D) and Vitamin B2 (Neuro-B) were given orally for 15 days. To maintain fluid level, 5% dextrose saline (100 ml) was given daily in intravenous route. Movement and vigorous activity were restricted. The sutures were removed after 14 days. Radiographic assessment was continued until complete healing of the fracture.

Chapter 3

Results

Gradually improved weight bearing was observed on PO day 7, 18 and 30th. Surgical wound was also healed on PO day 7 and stitches were removed on the same day with no wound complication. Secondary bone healing was noticed on PO day 14 and 30 and finally at PO day 60, fracture alignment with bone healing was noticed. Swelling with entrance area due to pin migration was also observed as a complication (Figure:1-11).

Figures

Figure 1: Initial observation

Figure 2: Complete oblique disphyseal femur fracture

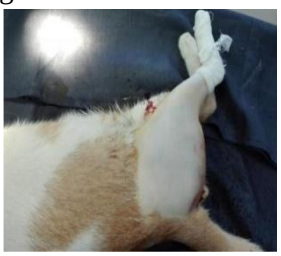
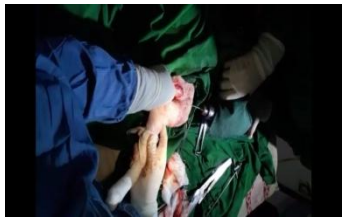


Figure 3: Preparation of the area of the surgery

Figure 4: Incision of muscle

Figures 5: Exposing the bone



Figures 6: Bone pinning

Figures 7: Intramedullary pinning

Figures 8: Apposition of fractured

Figures 9: Apposition of subcutaneous tissue

Figures 10: Suturing

Figures 11: Protecting surgical wound by soft cotton bandage

Chapter 4

Discussion

Post-operative management is very important to prevent post-operative complications. Pin loosening, pin migration and seroma formation are very common complications in this IMP technique,which support our work by Denny and Butterworth, 2007; Reems et al., 2003. Arun et al., 2011.,. However, infection and non-union may also be common complications in open fracture. Fracture are grouping systems including cause, anatomical location, morphology, whether or not the broken bone is exposed to the external environment, extent of bone injury, reducibility, stability, between others. (Piermattei., 2006, Scott and McLaughlin., 2007, Denny., 2000, Voss., 2009). Open reduction internal fixation is needed. Techniques that involve intramedullary pins have been devised for use of the femur which support our work (Harasen., 2002).Generally an intramedullary pin should occupy 70-80 percent of the diameter of the medullary cavity (Peirone., 2002) which support this work. Intramedullary pin application is faster and more easily applicable, removal of the osteosynthesis material subsequent healing is easy and it is a more cost-effective technique (Altunatmaz., 2017) Appropriate pin selection is very important to pin loosening and pin migration. Selection of appropriate pin depends on the size of the IMP cavity, the bone to be repaired, the fracture configuration and application of ancillary methods of fixation. Pin diameters of 1.6 mm to 4.8mm are suitable for use for most cats (Simon., 2016).

Conclusion

The present case study suggests the IMP was found to be an easy and effective method for the management of long bone fracture in animal. PO morbidity depends on the appropriate pin selection and PO care.

Summary

Successful Surgical Management of Femur Fracture by retrograde Intramedullary Pinning (IMP) in a cat was reported and recorded.

Limitations

This study has some limitations. Being a retrospective clinical investigation, various complication were in surgical approach such as PO management, complication management, and timing for dynamization and/or destabilization. The main limitations of this study is that failing to record post-operative conditions and radiograph pictures due to owner's ignorance.

References

Altunatmaz K, Karabağli M, Gydin D, Güzel O, Yalin EE, Uğurlu U, Sadalak DJ, Ekici H. The treatment of supracondylar and diaphyseal femoral fractures in cats using intramedullary two-way stacked Kirschner wire application. Turkish Journal of Veterinary and Animal Sciences. 2017 Apr 19; 41(2):282-7.

Arun Prasad A, Ayyappan, S., Das, BC, Md. Shafiuzama, Priya, S and Suresh Kumar, R.Surgical management of long bone fractures in cats: a review of 12 cases. Indian Journal of Veterinary Surgery, 2010., 31(1): 45-46

Beale B. Orthopedic clinical techniques femur fracture repair. Clin Tech Small Animal Pract 2004; 19: 134-150.

Cardoso CB, Rahal SC, Agostinho FS, Mamprim MJ, Santos RR, Mortari AC, Monteiro FO. Long Bone Fractures In Cats: A Retrospective Study. Veterinária e Zootecnia. 2016 Jan 9;23(3):504-9.

Denny H.R, Butterworth S.J. 2000. Classification of fractures, p.83-86. In: Ibid. (Eds). A guide to canine and feline orthopaedic surgery. Wiley-Blackwell, Oxford. 644p.

Denny, HR, Butterworth SJ, 2007. The femur. In : a guide to canine and feline orthopaedic surgery. 4th edition, Blackwell Science Ltd, London,pp: 495-510

Harasen G. Atraumatic proximal femoral physeal fractures in cats. The Canadian Veterinary Journal. 2004 Apr;45(4):359.

Harasen G. Fractures involving the distal extremity of the femur: Part 2—The mature patient. The Canadian Veterinary Journal. 2002 Feb;43(2):131.

Johnson A.L, 2007. Fundamentals of orthopedic surgery and fracture management, p.930- 1014. In: Fossum T.W. (Ed.), Small animal surgery. Mosby, St. Louis. 1632p.

Peirone B, Camuzzini D, Filippi D, Valazza A. Femoral and humeral fracture treatment with an intramedullary pin/external fixator tie-in configuration in growing dogs and cats. Veterinary and Comparative Orthopaedics and Traumatology Archive. 2002;15(2):85-91.

Piermattei D.L., Flo G. & DeCamp C. 2006. Brinker, Piermattei and Flo's handbook of small animal orthopedics and fracture repair. 4 ed. Saunders, Philadelphia. 818p.

Reems MR, Beale BS, Hulse DA. Use of a plate-rod construct and principles of biological osteosynthesis for repair of diaphyseal fractures in dogs and cats: 47 cases (1994–2001). Journal of the American Veterinary Medical Association. 2003 Aug 1;223(3):330-5.

Scott H.W. & McLaughlin R. 2007. Fracture classification, decision making, and bone healing, p.43-49. In: Ibid. (Eds). Feline orthopedics. Manson Publishing, London. 384p.Edinburgh. 582p.

Scott, HW and Mclaughlin R , 2007. Fracture fixation methods: principles and technique. In Feline Orthopaedic. Ist edition. Manson Publishing Ltd. London, UK, pp:58-86.

Scott H. Repair of long bone fractures in cats. In practice. 2005 Sep 1;27(8):390-7. 16.

Simon, M. Shiju, Gupta Chhavi, P. Sankar, R. Ramprabhu, and N. Pazhanivel. "Repair of Diaphyseal Femoral Fracture Using Intramedullary Pin and Cerclage Wire in a Cat.". Indian Veterinary Journal. 2016 February., 93 (02) : 67 – 68

Voss K, Montavon P.M. 2009. Fractures, p.129-151. In: Montavon P.M., Voss K. & Langley-Hobbs S.J. (Ed.), Feline orthopedic surgery and musculoskeletal disease. Mosby Elsevier, Edinburgh. 582p.

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The Author

Biography

I am Mahmud Bin Abedin, son of Md. Zoynal Abedin and Mahmuda Abedin. I passed my Secondary School Certificate(SSC) examination from Motijheel Model High Scholl and College, Dhaka in 2012(G.P.A-5.00) and Higher Secondary Certificate(HSC) examination from Dhaka College, Dhaka in 2014(G.P.A-5.00). I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh. I have immense interest to work in the field medicine and surgery.