

SUCCESSFUL SURGICAL MANAGEMENT OF FEMUR FRACTURE IN CAT BY RETROGRADE INTRAMEDULLARY PINNING (IMP)-2 CASES

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Abstract

Long 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- 2 cases. Case 1- an eight month old intact male indigenous cat weighing 2.8kg, limping in right hind limbs since 2 days and case 2- one and half years old intact male indigenous cat weighing 3kg, limping left hind limbs since 2 days were brought to Teaching Veterinary Hospital, Chittagong Veterinary and Animal Sciences University (CVASU) with the history of limping in right and left hind limb respectively since 2 days. Clinical examination revealed both the cats were active and alert but mild weight bearing, limping, pain and crepitation also noticed in affected limb. Radiographic examination confirmed the case 1-right distal diaphyseal transverse femur fracture and case 2- left proximal multiple diaphyseal femur fracture. On the basis of fracture patient assessment score (FPAS), the cases were decided for internal fixation by an intramedullary pinning with wiring. Case-1- retrograde intramedullary pinning and case 2-similar technique with 4 cerclage wires were performed with standard surgical approach and xylazine and ketamine anaesthesia. Postoperatively cats were managed by systemic antibiotic and pain killer with protective bandages. Mild weight bearing was observed in both cases of the 7th postoperative (PO) day and sutures were removed from same 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 in both cases. PO 4 months bone remodeling was noticed and both patients maintained a comfortable life and owners were also very happy. The present case study suggest the

intramedullary pinning with cerclage wires are an easy, economic and field based effective method for internal femur fracture fixation in cat.

Key word: Surgical Management, Femur Fracture and retrograde Intramedullary Pinning (IMP) cat

1.0 Introduction

Long bone fractures are common to small animals takes place in the hind limbs, and femur. femur and humerus fracture is one of the between 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, but anatomical differences need to keep in mind such as humerus and femur straighter, supra condylar foramen in the humerus in which brachial vessels and median nerve pass, presence of clavicle (Harasen., 2009). The femur was the most affected bone (50.84%) then other bone in cat. (Cardoso.,2016). femur factures 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.

2.0 Case history and observation

An 8 month and 1.5 years old indigenus male cat weighing 2.8 kg and 3.0 kg respectively were admitted to Teaching Veterinary Hospital, CVASU with the history of fall down and got pain on limb. limping in right and left hind limbs in cat since 2 days. Clinical examination revealed that cat-1 was active and alert but mild weight bearing in right hind limb, cat-2 had non weight bearing in left hind limb. pain and crepitation also noticed in affected limb. Blood parameters revealed normal values. Radiographic examination of cat-1 confirmed the right distal transverse femoral fracture and left proximal multiple femoral fracture in cat-2, hence the cases were decided for internal fixation by IMP.



Right distal diaphyseal transverse femoral fracture , case-1

Left diaphyseal multiple femoral fracture , case-2

3.0 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 both 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. In addition, 4 cerclage wires were used in cat-2 by 22 gauze stainless steel wire. Postoperatively, both cats were managed by systemic antibiotic, antihistaminic and pain killer with protective bandage and restricted movement for one week.



Distal diaphyseal fractures in case-1



Multiple diaphyseal fractures in case- 2



Short oblique diaphyseal fracture in case-1



Ancillary fixation by circleclage wire in case-2

Radiographic picture of case-1 immediate after surgery: pin in situ



Radiographic picture of case-2 immediate after surgery: pin in situ



Closure of surgical wound case-1

Closure of surgical wound case-2



Protected surgical wound by soft cotton bandage

4.0 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 from 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.

In cat-1, swelling with entrance area due to pin migration was also observed as a the complication but in cat-2 no such type of complication was observed.



Pin migration in case-1



Swelling and blood stinged fluid evacuated from case-1



Improved weight bearing on PO day 18

5.0 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 research(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 & 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 research (Harasen.,2002). Generally an intramedullary pin should occupy 70-80 percent of the diameter of the medullary cavity (Peirone.,2002) which support our research. 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. This hypothesis supports our research(Simon.,2016). Additional implant (cerclage wire) was used to prevent rotational force and axial loading. This hypothesis also supports our research(Simon.,2016, Harasen.,2002)

6.0 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.

7.0 Acknowledgements

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8.0 Summary

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

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