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Management of complete mid diaphyseal comminuted fracture of tibia and fibula in dog

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Abstract
Tibia and fibula are paired bone. Tibial fractures is common in small and large animals. The present case study was conducted for management of complete mid diaphyseal comminuted fracture of tibia and fibula in a one-year-old, 20 kgs bodyweight male intact Labrador retriever breed of dog. Locking Dynamic Compression Plate (DCP) is used to stabilize this type of fracture. Six hole DCP with 3.5 mm screws was effective in this case.

Keywords: Fracture, DCP, screw

1. Introduction
In dogs and cats, diaphyseal fractures of the radius and ulna are typical. One in six fractures observed during small animal exercise are fractures of the radius and ulna (Harasen, 2003) [1]. In the majority of instances, the distal or middle third of the radius and ulna are affected by the fracture. Both bones are regularly fractured, but only sometimes does one of the radius or ulna occur alone (Ness and Armstrong, 1995) [2].
The aim of fracture treatment is to achieve rapid-fire bone union and conserving involved joint as well as soft tissues. This may be completed with inflexible inner fixation, atraumatic tissue handling, and early movement of the joints. Long-term use of splints or casts can cause stiffness of joint, muscle, tendon, and bone contracture, as well as atrophy of the muscles and bones. Fracture disease is the term used to describe this range of consequences. These issues can be avoided by returning to weight-bearing and joint motion sooner.
External coaptation utilising casts or splints (Lappin *et al*., 1983) [3], bone plating (Gibert *et al*. 2015) [5], and external skeletal fixation (Piras *et al*. 2011) [4] are the common techniques of treating radius and ulna fractures. It is widely acknowledged that bone plating routinely produces positive results in the treatment of tibia and fibula fractures. The dynamic compression plate (DCP) is the one that is most frequently utilized.
The distal tibia and fibula fractures are recognized as having a frequency of delayed union or nonunion as high as 80% when treated with external coaptation or intramedullary pinning. Plate osteosynthesis using conventional or locking compression plates DCP produces positive clinical results with a significant complication rate of under 6% (Ramírez and Macías, 2016) [6]. The study's goal is to determine whether the dynamic compression plating technique is effective at Prayash Team Environment Charitable Trust, Surat.

2. Case History and Observation
The study was conducted at surgery unit of Prayash Team Environment Charitable Trust, Surat. A one year old male Labrador retriever weighing 20kg presented with history of accident and from that limping in left hind limb. Clinical and orthopaedic examination revealed active and alert but reduce appetite, non-weight bearing, pain on palpation, swelling and crepitation. Radiographic examination revealed complete mid diaphyseal comminuted fracture of tibia and fibula (Figure 1). Nurological examination revealed positive conscious proprioception and deep pain reflex. The case was decided for open reduction internal fixation (ORIF) with dynamic compression plating based on the fracture patient assessment score (FPAS).

3. Patient Preparation, Anesthesia and Operative technique
The dog was sedated by using xylazine hydrochloride @ 2 mg/kg body weight along with butorphanol tartrate @ 0.2 mg/kg body weight.

Under this sedation clipping and shaving were done on affected limb proximally above the stifle joint and distally below the tarsal joint and surgical areas were made aseptic by using 7% povidone-iodine and 70% alcohol. Induction was performed by using of diazepam @ 1 mg/kg body weight followed by propofol @ 4 mg/kg body weight and maintain by monitoring of patient approximate half of the induction dose. The patient was positioned in lateral recumbency with affected limb downward (Figure 2). Through the medial approach, a linear incision was done to exposed both proximal and distal end of the fractured bone and removed all soft tissue attachment of the fractured end (Figure 3). By using a manual and toggling approach, the fracture was anatomically decreased. The 3.5 mm 6 holes DCP with cortical screws were then applied to the medial aspect of the bone to fix it (Figure 4). The surgical wound was closed like a standard surgical procedure and applied Modified Robert Jones Bandage (Figure 5 and 6).

4. Postoperative care and Advise

Postoperatively, antibiotic-Ceftriaxone used for five days intramuscularly @ 20 mg/kg body weight, pain killer-Meloxicam used for three days subcutaneously @ 0.2mg/kg body weight. Advice was given to apply cold application in the affected area for three days and restricted movement for one week, keep the surgical area dry, neat and clean until wound healing and follow up checkup especially for radiographic evaluation of bone healing.

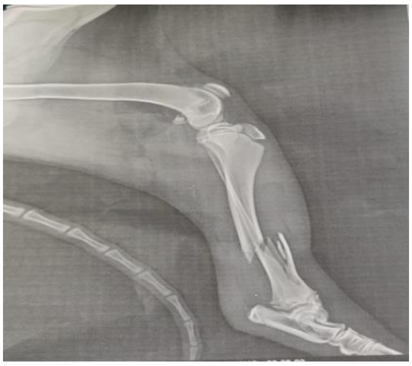

Fig 1: Lateral radiograph of affected limb revealed complete mid diaphyseal comminuted tibial fracture.

Fig 2: A linear incision was made on medial. aspect of affected site.

Fig 3: Exposed fractured fragments.

Fig 4: Fixation of fractured bone by using 3.5 mm 6 hole dynamic compression plate.

Fig 5: Closer of surgical wound by non-absorbable suture material.

Fig 6: Applied modified Robert jhone bandaging after surgery.

5. Result and Discussion

Following surgery, the outcomes were assessed using clinical and radiographic assessment. An X-ray was taken following surgery, showing the implant (plate and screws) in place (Figure 7). On 10th day of surgery the outcomes were assessed using clinical and radiographic assessment.

An X-ray was taken right away following surgery, showing the implant (plate and screws) in place (Figure 8). Clinically, the functional limb outcome was excellent 45 days after surgery, and radiographic examination revealed that the implant (plate and screws) was in place, the fracture gap had shrunk, and primary healing had taken place (Figure 9). There were no issues with the wound, plate, or screws in the 45 days following surgery, but there was a slight reduction in the mobility of the stifle joint when the joint was flexed.

Fig 7: Lateral radiograph immediate after surgery.

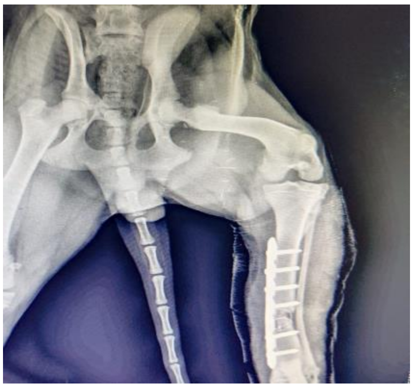

Fig 8: VD radiograph on 10th day of surgery.

Fig 9: AP radiograph on 45th day of surgery.

In the current case study, the use of dynamic compression plating technique led to the effective surgical management of complete mid diaphyseal comminuted tibial fracture in a dog. The dog, a male intact 1-year-old, weighed 20 kg, and the cause of the fracture was an accident.

The theories and newly created fracture fixation techniques were reported by Muller *et al*. in 1970. The original principles of the Arbeitsgemeinschaft für Osteosynthesefragen (AO) philosophy included open precise reduction and rigid fixation of all fracture fragments. The most frequent procedures for fixing fractures of the radius and ulna involve external coaptation with casts or splints. According to Piermattei and Flo (1997) [8], bone plating is a commonly used procedure that regularly produces positive results when treating long bone fractures. Because it possesses the inherent capacity of compression at the fracture site, the dynamic compression plate (DCP) is the plate that is utilised the most commonly among the other ones. Denny and Butterworth (2000) suggested that this approach is particularly appropriate for mature dogs with overriding oblique, comminuted, or transverse fractures. In the present case study, 3.5mm 6-hole dynamic compression plate was used for the correction of tibial fracture in a male dog which was supported by the above findings.

6. Conclusion

Radial fractures are most common in the distal one-third of the diaphysis of small and large breeds of dog and have a greater risk for development of delayed union or nonunion. The approach chosen to treat radial fractures affects how quickly the wound heals. In the current case study, a 2.7mm 8-hole dynamic compression plate was used to treat a distal diaphyseal overriding transverse radial fracture. This study came to the conclusion that the DCP technique can be successfully used in field situations for the therapy of distal radial fractures in Labrador retrievers.

7. References

1. Harasen G. Common long bone fracture in small animal practice-part 2. The Canadian Veterinary Journal. 2003;44(6):503-503.
2. Ness MG, Armstrong NJ. Isolated fracture of the radial diaphysis in dogs. Journal of Small Animal Practice. 1995;36(6):252-254.
3. Lappin MR, Aron DN, Herron HL, Manati G. Fractures of the radius and ulna in the dog. Journal of the American Animal Hospital Association. 1983;189:643-650.
4. Piras L, Cappellari F, Peirone B, Ferretti A. Treatment of fractures of the distal radius and ulna in toy breed dogs with circular external skeletal fixation: a retrospective study. Veterinary and comparative Orthopaedics and traumatology. 2011;24(03):228-235.
5. Gibert S, Ragetly GR, Boudrieau RJ. Locking compression plate stabilization of 20 distal radial and ulnar fractures in toy and miniature breed dogs. Veterinary and Comparative Orthopaedics and Traumatology. 2015;28(06):441-447.
6. Ramírez JM, Macías C. Conventional bone plate fixation of distal radius and ulna fractures in toy breed dogs. Australian Veterinary Journal. 2016;94(3):76-80.
7. Müller ME, Allgöver M, Willenegger H. Manual of Internal Fixation. Berlin Heidelberg New York: Springer Verlag, p. 22.
8. Piermattei DL, Flo GL. Fractures of the radius and ulna In: Handbook of small animal orthopaedics and fracture repair, third edition, edited by Saunders, Philadelphia; c1997. p. 321-343.
9. Denny HR, Butterworth SJ. The radius and ulna in: a guide to canine and feline orthopaedic surgery, 4th edition, edited by Backwell Science Ltd. Oxford, London; c2000. p. 389-407.
10. Raj HP, William BJ, Thilager S, Prathaban S, Kumanan S. Theloscopic and ulatrasonographic evaluation of udder and teat and minimally invasive theloscopic surgery with bio implant for milk flow disorders in dairy cows and buffaloes, Tamil Nadu University of Veterinary and Animal Sciences, Tamil Nadu; c2010.
11. Twardon J, Dzieciol M, Nizanski W, Dejneka GJ. Use of ultrasonography in diagnosis of the teats

disorders. Medycyna Weterynaryjna. 2001;57(12):874-875.

12. Szencziova I, Strapak P. Ultrasonography of the udder and teat in cattle: perspective measuring technique. Slovak Journal of Animal Science. 2012;45(3):96-104.