

# SUCCESSFUL SURGICAL MANAGEMENT OF PROXIMAL ULNAR FRACTURE BY TENSION BAND WIRING IN A 11 MONTH OLD GERMAN SHEPHERD DOG

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An eleven month old, 25.950 kg German shepherd dog was presented to the Small Animal Orthopaedic Unit of Veterinary College Teaching Hospital with the history of non-weight bearing lameness since one week on the left fore limb due to a fall from second floor of the house. Palpation of the left elbow joint revealed pain, swelling and crepitus. Orthogonal radiography revealed a segmental ulnar fracture with two fracture lines one at proximal olecranon and other an oblique fracture at the proximal shaft of ulna (AO 2 1 A 1). A pre-operative plan was prepared using a small animal preoperative planning guide developed by the AO/ASIF with Plan A as "Plate Osteosynthesis using 06 hole, 3.5 mm LCP and Plan B as "Tension band wiring". Intra operatively, Plan B was executed i.e. Tension band wiring was done using two Steinmann pins (size 1.8 mm) placed laterally with a two figure of eight wiring done using 24G stainless steel wire. Post-operative radiographs and gait analysis on 8<sup>th</sup> and 12<sup>th</sup> week revealed clinical union.

**Keywords:** Fracture, Proximal ulna, Tension band wiring, GSD.

Fractures of the ulna are common in dogs and most often involve the distal region of the diaphysis in conjunction with radial fractures. Provided union of the radius occurs, the outcome of the ulnar fracture is not of great concern. However, fractures of the proximal ulna are more challenging either because they may be intra-articular or they may disrupt the insertion of the triceps tendon. Fixation methods described for repair of proximal ulnar fractures in dogs include: placement of a large bone plate on the lateral surface of the ulna, application of a conventional plate or a customized hook-plate on the caudal surface of the ulna, external coaptation, Kirschner pins and tension band wire (Grafinger *et al.*, 2007., Mullett *et al.*, 2000., Tyagi *et al.*, 2002) and lag screw fixation. A successful management of proximal ulnar fracture in a eleven month old German shepherd dog is placed on record.

## Case history and Treatment

A eleven month old, 25.950 kg German shepherd was presented to the Small Animal Orthopaedic Unit of Veterinary College Teaching Hospital with the history of non-weight bearing lameness since one week in the left fore limb due to a fall from second

floor of the house. Palpation of the left elbow joint pain, swelling and crepitus. Orthogonal radiography revealed a segmental ulnar fracture with two fracture lines one at proximal olecranon and other an oblique fracture at the proximal shaft of ulna (AO 2 1 A 1). (Fig-1). Apre-operative plan was prepared using a small animal preoperative planning guide developed by the AO/ASIF with Plan A as "Plate Osteosynthesis using 06 hole, 3.5 mm LCP and Plan B as "Tension band wiring".

Pre-operatively Inj. Ceftriaxone and Tazobactam was administered at a dose of 20 mg/kg body weight intravenously. The animal was premedicated with Inj. Atropine sulphate @ 0.04 mg/kg b.wt subcutaneously, Inj. Butorphanol @ 0.2 mg/kg body weight intramuscularly followed by Xylazine hydrochloride @ 1 mg/kg body weight intramuscularly. Induction and maintenance of anesthesia was done with Propofol intravenous to effect. With the animal in dorsal recumbency and elbow flexed, a lateral skin incision was made along the left elbow and minimal separations of the attached soft tissues were performed by blunt dissection to approach the fractured ends. Plan A as "Plate Osteosynthesis using 06 hole, 3.5 mm LCP

could not be executed owing to bigger size of the plate, hence a tension band wiring was done using two Steinmann pins (size 1.8 mm) placed laterally with a two figure of eight wiring done using 24 G stainless steel wire (Fig-2). The lameness grading was carried out. The animal started bearing weight on the

left limb by 10<sup>th</sup> post operative day. The case was followed for a period of 12 weeks with serial radiographs taken on 0, 8 and 12 weeks after Open Reduction and Internal Fixation (ORIF). Post-operative radiographs and gait analysis on 8<sup>th</sup> and 12<sup>th</sup> week revealed clinical union of the fracture (Fig-3).



**Fig 1 :** Lateral and Cranio caudal view “Pre operative” of left forelimb indicating a segmental ulnar fracture with two fracture lines one at proximal olecranon and other an oblique fracture at the proximal shaft of ulna (AO 2 1 A 1)

**Fig 2 :** Intra operative figure depicting drilling of hole and placement of two Steinmann pins on the proximal left ulna



**Fig 3 :** Lateral and Cranio caudal view 08 weeks post operative of left forelimb indicating clinical union of the fracture

## Discussion

Open reduction with internal fixation along with minimal disruption to the normal vascularity and soft tissue is the main goal of biological osteosynthesis. Anatomical reduction and rigid internal fixation of the left proximal ulna fracture resulted in successful fracture union. In the present case, a 1.8 mm Steinmann pin placed laterally in retrograde manner helped in achieving normal alignment of the fractured ends and tension band wiring using 24 G stainless steel wire which counteracted all the biomechanical forces acting on the fractured ends. Serial radiographs taken on 0, 4, 8 and 12 weeks after ORIF revealed excellent bone healing. Similar results have been achieved by other surgeons too (Srinivasa murthy *et al* 2010), though bone plates are the preferred fixation method for the treatment of intra-articular fractures of the proximal ulna.

## Summary

A successful management of left ulnar fracture 'AO 2 1 A 1' was done by tension band wiring using two Steinmann pin (size 1.8 mm) placed laterally with a two figure of

eight wiring done using 24 G stainless steel wire. Animal made uneventful recovery.

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