

MANAGEMENT OF TRAUMATIC ELBOW LUXATION IN AN ADULT ROTTWEILER DOG

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ABSTRACT

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A male Rottweiler of age 13-years was presented for the treatment of forelimb lameness due to automobile accident. Clinical and radiographic examination revealed lateral luxation of the left elbow joint. Firstly the closed reduction was attempted which was successful initially but after 10 days the joint reluxated. Afterwards open reduction was performed and the joint was successfully reduced.

Key words: Elbow luxation, trauma, dog

Introduction

Elbow luxation is not a common finding in small animal practice because of the inherent geometric stability and strength of the elbow joint. Complete luxation of elbow requires large forces. The luxation is typically lateral (the radius and ulna sit lateral to the distal humerus) and probably results from valgus bending forces from blunt trauma such as encountered in vehicular accidents. The medial condyle of the distal humerus is much larger than the lateral condyle and acts as an impediment to medial dislocation of the elbow (Smith, 1998).

Elbow luxation in small animals can be treated either by closed or by open method. In closed method, with the help of indirect traction applied with hanging the affected limb under body weight, muscle relaxation is achieved and the joint is tried to be reduced. Whereas in open method, the joint is reduced after surgically opening the joint and placing the articular surfaces in apposition by manipulation. The reduced joint can be provided enhanced support by placing the screws and wire along collateral ligament. After achieving the reduction, the joint is immobilized in extension position using Robert Jones bandaging, light bandage or spica splint. The irreparable joint is often treated by performing arthrodesis with the plate and screw placement (Mitchell, 2011 and Hamilton, 2014).

Case presentation and treatment

An adult male Rottweiler of body weight 55 Kg and age 13-years was presented in in Veterinary Clinical Complex, College of Veterinary and Animal Science, Bikaner for the treatment of left fore limb lameness after an automobile accident. Clinical examination revealed no crepitation sound but animal was lame with dragging of same limb and having severe pain. On further examination incongruity of elbow joint was noticed with the outward lateral projection of radial head. Radiographic examination of left elbow joint with both cranio-caudal and medio-lateral views revealed lateral luxation of elbow joint. The radiographic images did not reveal any secondary osteoarthritic changes at or near the articular surfaces of the distal humerus and proximal radius-ulna.

For the treatment, initially closed reduction of the luxated

joint was attempted. For the closed reduction, general anaesthesia was provided and the animal was first taken in dorsal recumbency on table and the affected left forelimb was suspended from an IV stand pole for 5 minutes. The suspension was done to reduce skeletal muscle contractions by the fatigueness of muscles under the body weight. Then the animal was taken in lateral recumbency with the affected limb on upper side and the elbow joint was flexed to 90 degrees. At this flexed position, by grasping the antebrachium the proximal end of radius-ulna was rotated internally to hook the anconeal process over the lateral supracondylar humerus into the supratrochlear foramen. The laterally palpated prominent radial head was then articulated with the distal humerus using digital manipulation prior to beginning gradual extension of the elbow. With firm digital force applied to the radial head to slide it from medial to lateral across the humeral condyles, the elbow was gradually extended and concomitantly the radius and ulna was internally rotated. At complete extension of the joint, the articular ends of the humeral and radius-ulna bones were found in normal alignment and there was considered the achievement of reduction of luxated joint. To check the status of reduction, manual flexion-extension of the elbow joint was performed, but it led to reluxation of joint. Then again repeating the same manipulation procedure joint reduction was achieved which was confirmed under C-arm fluoroscopic examination. After confirmation, the limb was immobilized externally with the elbow in extended position by applying Robert Jones bandaging with the angled moulded PVC splint. Considering the heavy weight of the animal, an extra POP bandage was also applied at the elbow joint site.

Since the animal was alert and healthy, it was discharged immediately from hospital after the completion of procedure and recovery from anaesthesia. Oral medications including antibiotics, analgesics and other joint supplements were prescribed for the post treatment period. The case was called for review after 10 days. On 10th day the case was presented with the loose bandage and the further examination revealed that the joint is reluxated. Closed reduction was attempted on the same day but it was a complete failure. So the decision

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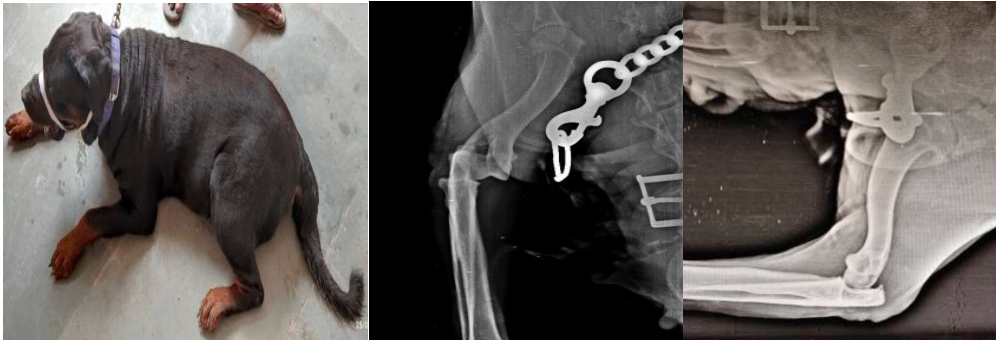


Fig. 1: (a) Preoperative clinical presentation of animal, (b) Caudo-cranial radiograph, and (c) and medio-lateral radiograph of the affected joint at the initial presentation

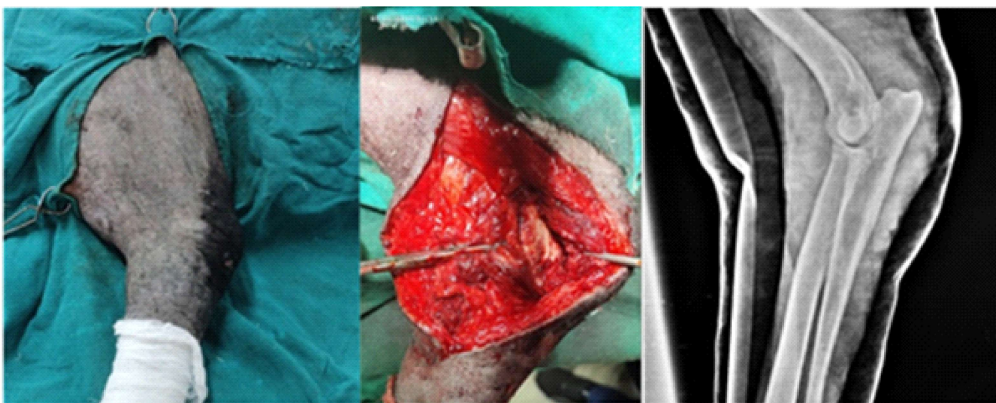


Fig. 2: Intra-operative exposed elbow joint and immediate postoperative radiograph of the reduced and externally immobilized elbow joint

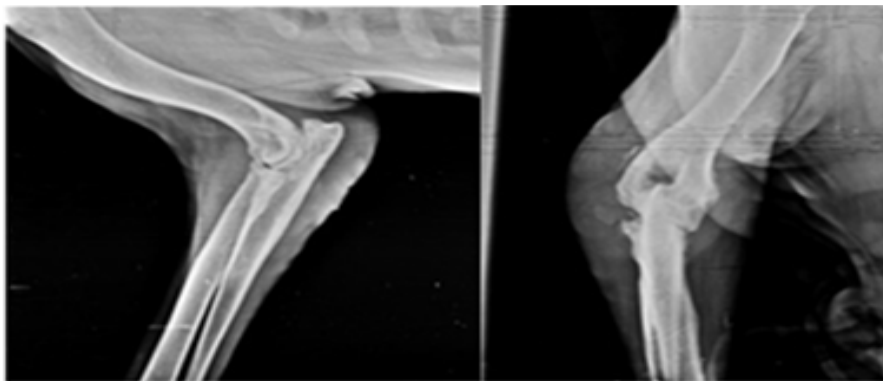


Fig. 3: Post operative radiograph after 1 month

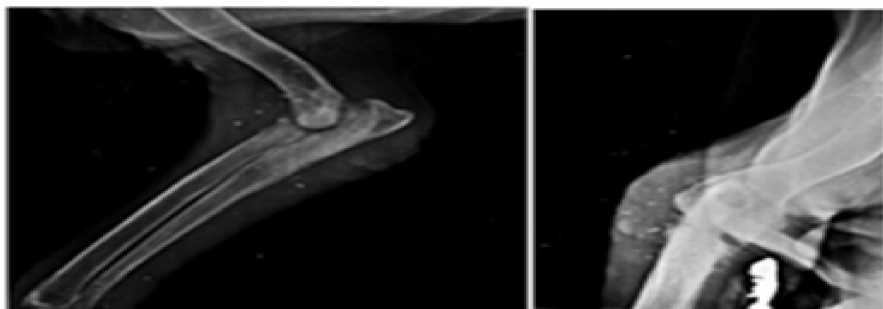


Fig. 4: Post operative radiograph after 6 month

for the open reduction was made with the consent of the owner.

For the open reduction of joint, the animal was placed in lateral recumbency in general anaesthesia with affected limb upside. A lateral incision was given on the elbow. Anatomic landmarks for open reduction of an elbow luxation are the radial head, olecranon and anconeal processes, and lateral humeral condyle. The deep branch of the radial nerve runs under the proximal cranial border of the extensor carpi radialis muscle. The superficial branch of the radial nerve lies between the lateral head of the triceps and the brachialis muscle and may be exposed in the cranial portion of the incision; it must be identified and protected during surgery. After proper separation of above structures joint was exposed and underlying soft tissue debris and blood clots present in between the articular surfaces were removed by flushing the joint with sterile normal saline solution. Elbow reduction was attempted by using a manoeuvre similar to closed method reduction. A blunt bone elevator was applied to provide leverage between the joint surfaces to facilitate reduction. This leveraging process was done with caution to avoid articular cartilage damage. After achieving joint reduction, it was checked for any recurrence of luxation by flexion-extension of joint. After confirmation of stability of apposed articular surfaces and the lavaging of wound with sterile normal saline solution, the surgical wound was closed by suturing in the standard manner.

Post operatively, tablet cefpodoxime 300mg (@ 5 mg/kgb.wt.) OD for 5 days, tablet carprofen 100 mg (@ 2 mg/kgb.wt.) BID for 5 days and powder synopet(it contains glucosamine and chondroitin), 8gm OD for 15 days were given orally. Plaster cast with moulded PVC splint was applied for external immobilization of joint for initial 7 days followed by supportive Robert Jones bandage with splint in extended joint for 15 days. This time the owner was advised for providing extra care to the animal with the strict restriction of its movement.

Immediate post-operative radiograph was taken which revealed that the joint was reduced in normal anatomical position. In follow up, after one postoperative month, animal showed partial weight bearing with intermittent lameness on the affected limb. However, at this time period, clinically there was found significant joint stiffness. On radiographic examination, there were found slight bony reactions at the joint surfaces. For the better movement of joint and to reduce its stiffness owner was advised for the physiotherapy.

Even after the physiotherapy for 6 months, animal showed no weight bearing on the affected limb with presence of swelling and pain at the joint. Radiograph at 6 months showed significant abnormal bony changes within the joint. At that time, it was planned to perform the arthrodesis of joint but seeing the non-compliance of owner, surgery was avoided. Finally, for the development of fibrosis around the joint and thus to provide

pain relief, counter irritant (ointment of red mercuric iodide) was applied on the skin surface at the joint.

Discussion

Traumatic luxation of the elbow joint is the most common luxation seen in small animal practice after the traumatic hip joint luxation. However, traumatic forces applied to the elbow joint more often result in fractures than dislocations (Bongartz *et al.*, 2008 and Meeson and Strickland, 2021). Schaeffer *et al.* (1999) observed that because of the relatively stronger collateral ligaments large, heavy dogs are more susceptible to elbow luxation than are small dogs, which was also present in our case. Residual instability following closed reduction of traumatic elbow luxations has been demonstrated to have a negative impact on the final outcome, with excellent and good follow-up results only reported when the elbow was stable immediately after reduction. It is conceivable that this finding has led to the adoption of more aggressive management of patients in which minor instability is identified following closed reduction (Sajik *et al.*, 2016). Open reduction is commonly used to treat luxation with unsuccessful close reduction or to stabilize reductions that easily reluxate or luxation with associated fractures or ligamentous injuries.

Conflict of interest

None of the authors of this article has a financial or personal relationship with other people or organisations that could inappropriately influence or bias the content of the paper.

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