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Short Communication

Temporo-mandibular dislocation with mandibular fracture in dog

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Abstract

A 12-year-old non-descriptive female dog was presented at Dept. of Surgery and Radiology, Sardarkrushinagar, with history of dropped jaw after automobile accident prior to 24 hours. Dog was off-feed since the accident, unable to move lower jaw even after manual manipulation and there is presence of swelling above orbit that appears like bony prominence. On palpation there is crepitation on swelling with movement of the lower jaw with slight improper movement of the right mandible was also felt. Radiographic examination of skull revealed rostro-dorsal luxation of temporo-mandibular joint (TMJ) and fracture of right horizontal ramus of mandible and it was decided to operate it. After ensuring antiseptic preparation, traction was applied on lower mandible, with counter traction on above. Subsequently, pressure was relieved from masseter muscle by pressing them outward, as mandible comes ventrally, it was pressed inward to correct luxation. Then mandibular fracture was corrected by passing a k-wire no.22 from posterior of canine teeth to anterior of incisors. Owner was advised to keep jaws closed for 5 days and maintained on semi-liquid feed. Animal made uneventful recovery as animal started normal feeding on 5th day post-operative. The K-wire was removed after 25th day post-operative.

Keywords: Mandibular fracture, Temporo-mandibular joints

Highlights

- Reduction of temporo-mandibular joint was successfully done under general anesthesia.
- Close reduction of TMJ was performed without surgical intervention, while the unilateral mandibular fracture was successfully immobilized with jaw wiring.
- Application of bandage at mouth after the reduction of TMJ dislocation provided adequate immobilization.
- Complete mandibular fracture healing was observed on 25th post-operative days.
- Correction of TMJ can be done with closed reduction method and restriction of jaw movement is essential for preventing recurrence.

The paired temporo-mandibular joints (TMJs) are transversely elongated condylar synovial joints formed between the left and right condylar processes of the mandible and the corresponding mandibular fossae. These fossae are formed by the base of the zygomatic processes of the squamous temporal bones. Each condyle of the mandible can be thought of as a cylinder running lateromedially and sitting within the trough of the corresponding mandibular fossa. The joint does not run in a truly transverse direction but is slightly angled in a ventrolateral–dorsomedial direction (Gemmill, 2008). TMJ luxation is referred to as a complete dislocation in which the articular surfaces of the joint are separated. A subluxation is a partial or incomplete dislocation (Arzi & Lantz, 2020).

Fractures in this region can be difficult to stabilize with direct fixation methods, so indirect fixation is often employed. The goals of fracture fixation, whether direct or indirect, include stabilization that results in a bony union and re-establishes normal occlusion to allow return to normal function (Rudy & Boudrieau, 1992). Commonly utilized indirect fixation techniques for stabilization of caudal mandibular and temporo-mandibular joint fracture/luxation include maxillomandibular fixation (MMF), with acrylic composite interarcade wiring, tape muzzles, and the bignathic encircling and retaining device (BEARD) technique (Wiggs & Lobprise, 1997; Nicholson et al., 2010; Smith & Legendre, 2012).

A 12-year-old non-descriptive female dog was presented at Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar, Kamdhenu University with history of dropped jaw condition after automobile accident prior to 24 hours (Fig. 1).

Dog was offfeed since accident, unable to move

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Fig. 1. Dropping jaw condition post-accident

lower jaw even after manual manipulation. There is presence of swelling above orbit that appears like bony prominence. On palpation found crepitation on swelling with movement of the lower jaw. Examination of the right mandible also revealed the presence of crepitus and pain at mid horizontal ramus of mandible. Radiographic investigation of the skull revealed rostro-dorsal luxation of temporo-mandibular joint and fracture of the right horizontal ramus of the mandible (Fig. 2), and it was decided to operate it.



Fig. 2. Temporo-madibular joint dislocation with unilateral jaw fracture

The site was surgically prepared by saving and scrubbing with a 7.5% povidone-iodine solution. The dog was pre-anesthetized with Inj. Xylazine @ 1 mg/kg body weight, IM, followed by intravenous administration of Inj. Ketamine hydrochloride @ 5 mg/kg body weight and Inj. Diazepam @ 0.5 mg/kg body weight in a combination for induction and maintenance of general anesthesia. Infusions of normal saline were maintained intravenously during the intraoperative period. The incision site was cleaned with 70% ethyl alcohol just before surgery.

Both thumbs were inserted into the oral cavity, and downward traction was applied to the lower jaw, with counter-traction above (Fig. 3).



Fig. 3. Correction of TMJ dislocation

The lower jaw was then drawn out anteriorly and brought inward to reposite the displaced TMJ. As reduction occurred, a definite click was heard. An immediate post-operative radiograph was done to confirm reduction of the TMJ (Fig. 4) Following that



Fig. 4. Post- operative radiograph after TMJ reduction and Jaw wiring

mandibular fracture was corrected with jaw wiring. Two holes were drilled in right fractured mandible and cerclage wiring was performed to immobilize the fracture (Fig. 5).



Fig. 5. Jaw wiring for immobilization of mandibular fracture

Post-operative care involved administering injection ceftriaxone @ 20 mg/kg body weight intramuscularly for 5 days and injection meloxicam @ 0.2 mg/kg body weight intramuscularly for 5 days. Tablet pantoprazole was given for 5 days @ 1 mg/kg body weight. Closure of mouth was done with bandage. The owner was advised for keeping mouth closed for 5 days and cerclage wire was removed at 25th day post-operative (Fig. 6).

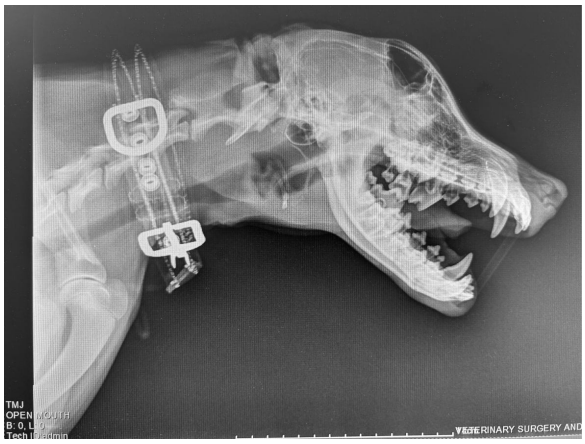


Fig. 6. 25th days post-operative radiograph indicating reduction of TMJ dislocation and removal of circlage wire

Temporo-mandibular joint luxation in dogs is mostly associated with trauma as also noted by Jung et al. (2023), particularly automobile accidents, and is often accompanied by concurrent mandibular fractures due to the forceful impact on the facial skeleton. As in the present case, cranio-dorsal luxation of the TMJ, along with fracture of the horizontal ramus of the mandible, resulted in inability to close the mouth, pain, and abnormal mandibular movement.

Closed reduction remains the treatment of choice for acute TMJ luxation when there is no severe articular damage associated with trauma. In the present case, early intervention within 24 hours of injury facilitated successful closed reduction by relieving masseter muscle spasm and applying controlled traction and counter-traction.

Along with anatomical reduction that is required for proper maintenance of joint congruity, it is also important to restrict movement of the jaw, as a reduced joint is susceptible to recurrent luxation under excessive movement of the jaw.

The animal made an uneventful recovery without any complications as it started operating its mouth as before the incident. Correction of TMJ can be done with the closed reduction method and restriction of jaw movement is essential for preventing recurrence. The uneventful recovery observed in this case highlights the effectiveness of early diagnosis, appropriate anesthesia, closed reduction technique, and postoperative management. This case emphasizes that closed reduction combined with temporary jaw immobilization and fracture stabilization is a simple, economical, and effective approach for managing traumatic TMJ luxation with concurrent mandibular fracture in dogs.

Conflict of interest: Authors have no conflict of interest in the present study

Author's contribution: RG: Carried out reduction of TMJ and jaw wiring; JP: Maintained the general anesthesia; AP: Carried out radiographic examination at pre- and post-operatively; SK: Post-operative care of patient.

Data availability statement: We have all the snaps of the case till the recovery. The dataset generated during research will be available from the corresponding author on reasonable request.

Use of artificial intelligence tools: The author(s) did not use any artificial intelligence tools or generative AI services during the preparation of this work. Traditional search engines and academic databases were used solely for literature research.

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