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# MANAGEMENT OF UNUSUAL TYPES OF MANDIBULAR FRACTURES IN THE DROMEDARY CAMELS

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## ABSTRACT

Twenty eight camels of both sexes had un usual mandibular fractures. These were 14 males and 14 females, age between 1- 7 years or older. The site of fractures was at the horizontal rami either unilateral or bilateral or at the vertical ramus of mandible. Longitudinal fractures were also encountered splitting the incisors apart. Oblique unilateral fractures were not uncommon. Bilateral comminuted fractures occurring at horizontal rami resulted in mal- occlusion. The fractures were treated using cerclage or hemi-cerclage wires combined with cortical screws, using copper wire or with plates and screws.

**Key words:** Camel, fracture, mandible, radiography

Mandibular fracture is said to be a common injury in the camel (Ramadan, 1992; Gahlot and Chouhan, 1994). Sporadic reports of such fractures go back to the end of the 19th century (Steel, 1890).

These fractures predominantly occur in male camels during the rutting season as a result of bite or trauma (Gahlot *et al,* 1984). The classical site of the fracture is at the conjoined part of mandible, either across the tushes or rostral or caudal to these. In minority of cases the fractures are located caudal to 1st premolars (Gahlot and Chouhan, 1994; Ahmed, 2011; Siddiqui *et al,* 2012a).

A simple satisfactory method of treating mandibular fractures was through the application of interdental wiring (Leese, 1927; Gahlot *et al,* 1984; 1989).

Rathore and Singh (1963) treated 5 cases of mandibular fractures with transfixation pins. Stainless steel pins were inserted through the skin and bone and enclosed in a plaster of Paris cast. Other form of management of jaw fractures include plaster of Paris bandage and a wooden splint (Lavania, 1998), plates and screws (Kumar *et al,* 1977; 1979; Ramadan and Abdin-Vey, 1990; Ramadan, 1992, 1994) and aluminum U-bar techniques (Ahmed, 2011). Management of typical types of the fracture was rarely reported (Siddiqui *et al,* 2012b).

The aim of the study was to provide clinical, radiographic details as well as management of unusual types of mandibular fractures in the dromedary camel.

## Materials and Methods

Among the animals admitted to the veterinary teaching hospital suffering from mandibular fractures, 28 animals were subjected to analysis. Each animal was examined clinically and radiographically. Radiographs were obtained on the medio-lateral plane and sometimes ventro-dorsal radiographs were also obtained while the cassettes were situated intra-orally. The sex, age and type of fracture were recorded.

## Results

The signs of atypical form of the fracture varied from those of longitudinal split between incisors (Figs 1,2) to a simple vertical fracture of the horizontal ramus or comminuted bilateral fracture of both the rami. The simple vertical fracture produce partial mouth occlusion, tilting and lowering of the mandible towards the affected side (Figs 3,4). While in bilateral comminuted fracture of both the rami, the animal remains off-feed and unable to prehend or masticate and it may die unless attended on early. The radiographic findings showed that in the atypical fracture, the fracture line was situated at the base of vertical ramus, being comminuted, near conjoined rami or oblique at the rostral part or longitudinal near the symphysis (Table 1, Fig 5-10).

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**Table 1.** Sex, age and site of unusual jaw fractures.

| Sex | | Age (years) | Site |
|---|---|---|---|
| M | F | | Type of fracture |
| 1 | 3 | 1-3 | Vertical fractures between central and lateral incisors |
| 1 | 3 | 1-3 | Unilateral oblique caudal to corner incisors |
| 3 | 0 | 2- 5 | Oblique fracture cranial to P1 |
| 0 | 2 | Above 7 | Caudal to P1 bilateral flying 90 degree |
| 0 | 2 | | Bilateral fracture cranial to P1 and the second fracture caudal to P2 |
| 4 | 1 | Above 7 | Unilateral vertical fracture between P2-P3. Tilting of fractured ramus (lower) than normal side |
| 2 | 0 | | Unilateral transverse across vertical ramus |
| 3 | 3 | Above 7 | Bilateral different rami caudal to P2, mostly comminuted |
| 14 | 14 | | Total = 28 |

### *Surgery*

Each animal was sedated by intravenous injection of xylazine hydrochloride 2% (Rompun, Bayer) at the dose of 0.2 mg/kg body weight. The regime is supplemented with local infiltration analgesia using 2% lignocaine hydrochloride. The anaesthesia was maintained by Total Intravenous Anaesthesia with xylazine and ketamine (Almubarak *et al*, 2008). The animal was secured on the sternal position and the affected side was approached aseptically.

Fractures of vertical ramus was approached by skin incision made in the lateral masseter region (Fig 11-12). Following skin incision, the fascia and cutaneous muscle was incised. The blood vessels, parotid duct and nerves were isolated. A suitable 6-hole plate was pushed under the masseter placing the plate as near the ventral part as possible. The fracture was reduced and fixed with cortical screws. The masseter muscle and fascia was repaired and skin was sutured with non-absorbable sutured material.

Fractures of the vertical ramus was approached in a similar manner but the skin incision was made at the base of the vertical ramus.

Unilateral fracture of transverse ramus may be united either by figure of 8 wiring or with single plate and screws. Comminuted fractures were repaired by plates and screws. Fractures causing longitudinal split of the rostral part of the mandible were treated either by interdental wiring or with single cortical screw or with both. Follow-up radiograph revealed favourable results (Fig 13).

## Discussion

The classical signs of mandibular fractures include ventral deviation of the rostral part of the lower jaw, dribbling of saliva and buccal wound (Ramadan, 1994). Mandibular fractures were predominantly reported in male camels during rutting period with male to female ratio of about 4:1 (Gahlot and Chouhan, 1994; Ramadan, 1992; Ahmed, 2011). However, in the present study the

**Fig 1.** A swelling at lateral part of jaw due to fracture at ventral ramus.

**Fig 2.** Distortion of mandible due to bilateral fracture of both rami.

**Fig 3.** Longitudinal fracture between incisors during surgery.

**Fig 4.** Reduction of previous fracture.

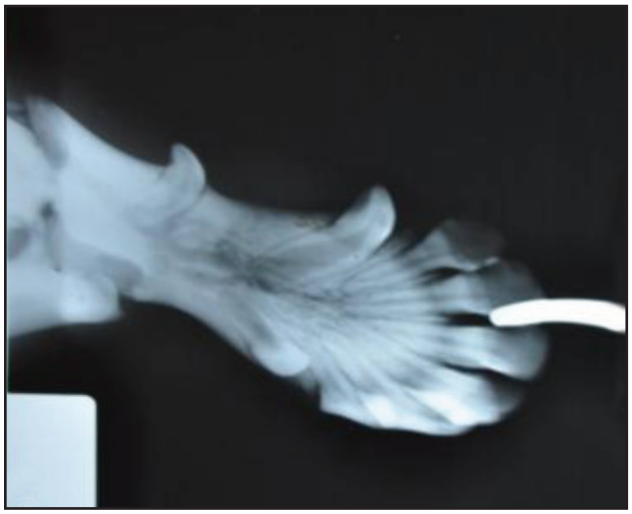

**Fig 5.** Ventrodorsal intra-oral radiograph , bilateral comminuted fracture at different rami.

**Fig 6.** Treating the fracture in Fig 5 using plates and screws.

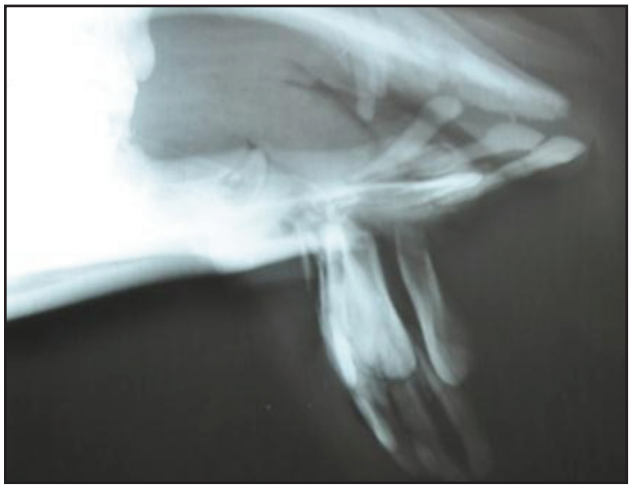

**Fig 7.** Tangential split of rostral part of jaw.

**Fig 8.** Circumferential wire and screw.

male/female ratio was nearly 1:1. This indicate that trauma by automobile agent or catching the rostral part of the jaw on fence or feeding trough could play a role in initiating the fractures (Kumar *et al,* 1979). The treatment depend on surgeon's preference. Splitting of the rostral part of mandible respond to cerclage wire reinforced with cortical compression screws while single unilateral fracture of the horizontal ramus respond to treatment with figure of 8 wiring technique as well as with plates

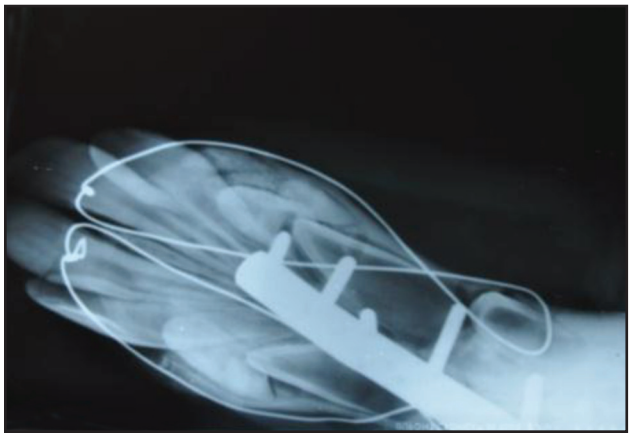

**Fig 9.** Ventrolateral radiograph application of figure of 8 wire and ventral plating

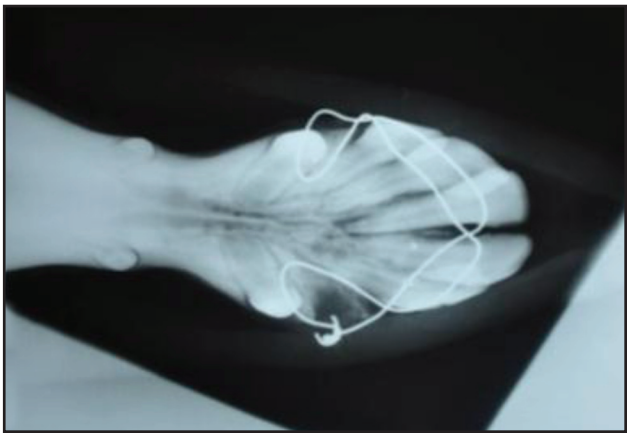

**Fig 10.** Application of figure of 8 wire.

**Fig 11.** Exposure of a transverse fracture at lateral horizontal ramus.

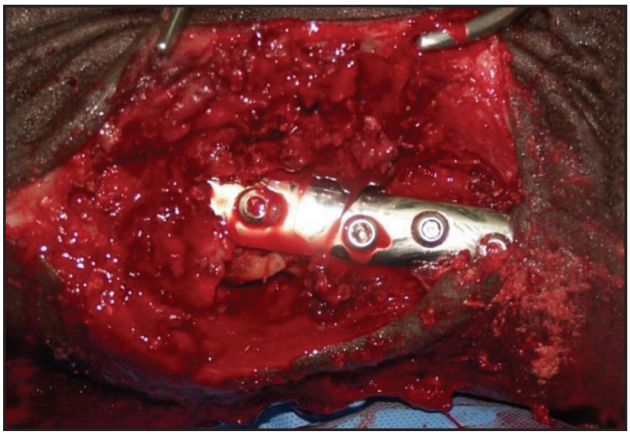

**Fig 12.** Application of plate and screws across the fracture.

**Fig 13.** A camel treated 8 weeks ago from fracture using figure of 8 wire.

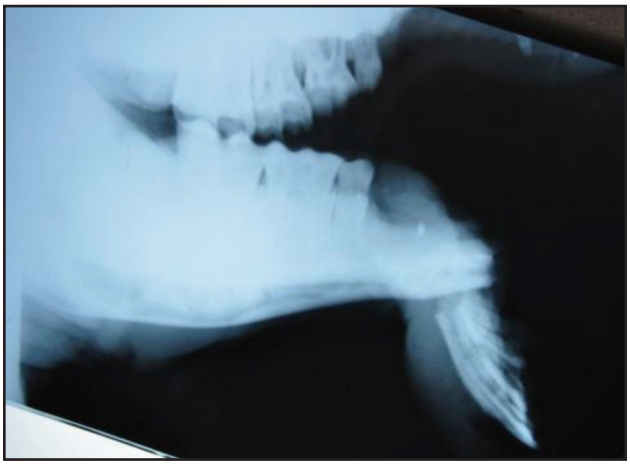

**Fig 14.** Lateral radiograph showing transverse fracture at base of canines.

and screws. Fracture of vertical ramus carried poor prognosis.

Numerous techniques for management of mandibular fractures have been tried by different authors. These include wiring (Hanuman and Gahlot. 2001), percutaneous transfixation (Rathore and Singh, 1963), plaster of Paris cast fixation (Lavania, 1998), U aluminum bar method (Ahmed, 2011), bone plating (Ramadan and Abdin-Vey, 1990) and partial mandibulectomy (Purohit *et al,* 1984).

Wiring is an inexpensive, technique but during the postoperative period, the lateral limbs of the wires may slip downward in line that may lead to downward malalignment or even non-union of the fracture (Hanuman and Gahlot, 2001). Embedding of the lateral limb of the wire in the gums also results in loosening of the wire with consequent ventral deviation of the cranial fracture fragment (Siddiqui and Telfah, 2010). This problem may be solved by modifying the tunnel of wiring (Siddiqui *et al*, 2012a) or the use of plates and screw (Ramadan,1994). Bone plating is not without adverse effects. The advantages of bone plates includes rigid stabilisation of the fracture and rapid return to normal function. Fractures stabilised with bone plates heal with little or no callus formation. The disadvantages is that it needs specialised expensive equipments and surgical expertise. It is prone to sepsis also (Al-Dughaym *et al*, 2003).


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