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SURGICAL MANAGEMENT OF MANDIBULAR FRACTURES IN CAMELS USING MODIFIED IDW (IDW AND TRANSFIXATION OF PINS WITH FIBRE CAST) TECHNIQUE

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ABSTRACT

In the present study, the clinical and radiological assessment of mandibular fractures in 6 male camels (*Camelus dromedarius*) of 3-14 years age was carried out. The fractures observed were bilateral and compound (83.33%) and bilateral and closed (16.66%) in nature. However, the fracture site at horizontal ramus recorded was anterior to tushes (33.33%) and across the alveoli (66.66%). Mandibular fracture cases were treated by Modified Interdental Wiring (IDW and Transfixation of Pins with Fibre Cast) technique. The animals were sedated with xylazine @ 0.4 mg/kg BW. Clinical and radiographical fracture union was observed within 06.83±0.31 weeks in the animals. During fracture healing complications of pin migration (33.33%), fibre cast bite wound (33.33%), development of sub mandibular abscess (16.66%) and mucosal wire gall wound (100%) were observed. Osteomyelitis was not observed as a complication after surgical repair of mandibular fracture.

Key words: Camel, fibre cast, interdental wiring, mandibular fracture, transfixation of pins

Mandibular fractures are the most common type of fractures in camels which often occur during breeding (rut) season in males following fighting with each other (Ahmed, 2011; Rastabi *et al*, 2017; Singh *et al,* 2020), wherein the animals become active, vicious and tend to bite each other leading to abnormal stress on the mandible leading to fracture (Gahlot, 2000). Mandibular fracture occurs commonly in male camels because of powerful forces generated by the jaw muscles action on the weakest part of mandible. Long inter-dental space, presence of alveoli of first premolar or tushes and presence of mental canal make the lower jaw weak and fracture occurs at this point (Gahlot, 2010). The affected animals are unable to prehense due to ventral deviation of the mandible and lower lips owing to fracture (Rastabi *et al,* 2017). Different surgical techniques have been used for fixation of mandibular fractures in camels including interdental wiring, U-bar application, combination of cross pin fixation, and tension band wiring and bone plating (Rastabi *et al,* 2017). The success of fracture repair depends mainly on the use of suitable methods of immobilisation (Al-Sobayil *et al*, 2020). Interdental wiring technique has been reported by Gahlot *et al* (1989) and Bhabbhor *et al* (2020) to repair mandibular fractures in camels.

The present study is based upon evaluation of modified interdenatal wiring technique to repair mandibular fractures in dromedary camels.

Materials and Methods

Six adult male camels aged between 3-14 years having mandibular fracture were subjected to immobilisation at Surgery section of Veterinary Clinical Complex of College of Veterinary and Animal Science, RAJUVAS, Bikaner. These animals were not able to prehense food as both the lips were set apart due to the hanging of fractured rostral fragment of the mandible. The clinical examination was carried out by a careful per-oral examination of lower jaw. The separation of both the lips, drooling of saliva and gingiva were noted for its discontinuity and wounds. The location of fracture was ascertained in terms of anterior, posterior or across the alveoli of tushes. The nature of fracture was also noted in terms of whether, transverse, oblique or multiple. Lateral radiographs of horizontal ramus of camels were analysed for confirmation of type of fracture (Fig 2). Pre-operative

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antibiotics (Oxytetracycline @5mg/kg IV OD) and non-steroidal anti-inflammatory agent (NSAID) (Meloxicam @0.5mg/kg IV OD) were administered in all the animals. Animals were secured in sternal recumbency following sedation with Xylazine @ 0.4 mg/kg BW, intravenously. Oral cavity was irrigated with light solution of potassium permanganate and the fracture was immobilised by modified Interdental Wiring (IDW and Transfixation of Pins with Fibre Cast) technique (Fig 3). Interdental wiring was performed as per the technique (IDW) of Gahlot *et al* (1984). The copper wire (2 mm diameter) was passed bilaterally and both the ends were knotted separately. Excessive length of wires was trimmed with a wire cutter and knot ends were twisted up towards the incisor teeth. Two intramedullary pins (3.5mm) were inserted transversely into the horizontal ramus at caudal part latero-medially and two pins were inserted into rostral fractured part ventro-dorsally. Adequate cotton padding was applied between the all pins then a fibre cast bandage was applied. The fibre cast bandage (5inch x 3.5metre) was dipped into water for half a minute and then it was applied across the all four pins in a square fashion. Both the fractured ends of mandible were kept in perfect apposition at the time of fibre cast bandage application. The cast was allowed to dry for 2-3 minutes.

Post-operative Care

All animals were kept under clinical observation for at least 10 days and postoperatively, broad spectrum antibiotic (Oxytetracycline @5mg/Kg IV OD) and NSAID (Meloxicam @0.5mg/kg BW IV OD) and B-complex IM OD, intramuscularly were administered for 7 days, 5 days and 5 days, respectively The oral cavity was flushed daily with light potassium permanganate solution for 10- 15 days. All the animals started prehensing soon after application of IDW and transfixation of pins with fibre cast. Animals were offered soft leaves fodder, devoid of straws for two weeks and thereafter routine roughage was allowed. A submandibular abscess at the fracture site on ventral aspect developed in one case, 10-15 days after fracture. It was drained by incising at the depending part and was dressed routinely. The owner was advised to keep the animal confined alone in a separate enclosure for a period of at least six-eight weeks. On follow-up further, post-operatively radiographs were taken for evaluation of fracture healing at a different time interval, i.e. 20 or 30 days, wherever feasible (Fig 4). The wires and pins were removed following satisfactory clinical and/or radiological union.

Results and Discussion

In animals of present study this technique proved efficacious in transverse mandibular fractures. In cases of present study, tightening of wires at knots was not required. However, clinical and radiological union took place in 6-8 weeks in the present study (Fig 6). These points to the fact that transfixation of pins together with fibre cast provided most adequate immobilisation. The transverse and oblique fractures were managed more efficiently with the technique (IDW and Transfixation of pins with fibre cast). In a previous study IDW alone led to overriding and shortening of jaw (Gahlot *et al,* 1989).

Bilateral mandibular fractures were observed in all camels of present study. These findings confirmed with the observations reported by Gahlot (2000), Purohit *et al* (2019) and Singh *et al* (2020). In the present study, the site of mandibular fracture was either anterior to tushes or across the alveoli. Similar findings were also recorded by Gahlot *et al* (1989) who found factures either anterior to tushes or posterior to tushes or across the alveoli in 50 camels. Rastabi *et al* (2017) and Saharan *et al* (2018) also recorded the site of mandibular fracture which was posterior to tushes. In the present study, all the cases of mandibular fracture were repaired by modified IDW (Interdental Wiring and Transfixation of pins with fibre cast) technique. In previous studies Gahlot (2000), Saharan *et al* (2018) and Singh *et al* (2020) used IDW technique. The development of a sub-mandibular abscess in open fracture was a common sequel during the healing period (Gahlot *et al,* 1984) as noted in one case of present study. However, a space between fibre cast and sub-mandibular area allowed easy drainage of sub mandibular abscess. The gingival wounds and buccal mucosa wire gall wounds occurred due to bite of wires or knots of interdental wiring in animals of present study which usually healed within one week after removal of the wire due to rich blood supply of oral mucosa. However, occurrence of such wounds was also reported previously by Ram (1997); Ahmed (2011) and Rastabi *et al* (2017). External callus formation at the fracture ends at various time intervals was noted. In the present study, none of the cases recorded osteomyelitis during the healing period. Similarly Ramzan (2008) reported a good surgical reduction, complications were rare and osteomyelitis seemed not to be a common sequel. Ahmed (2011) and Ahmed and Al-Sobayil (2012) recorded osteomyelitis as a potential complication in their studies. The migration of pin in one animal of present study could have been a result of over drilling of intra medullary

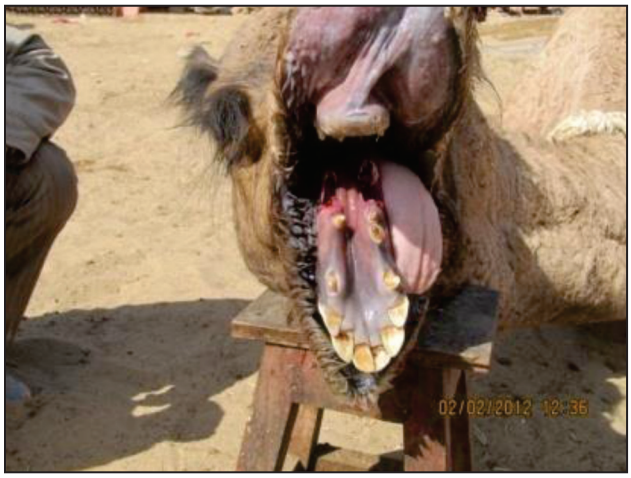

Fig 1. Mandible showing a bilateral compound transverse fracture of horizontal ramus.

Fig 2. Lateral radiograph of mandible showing transverse fracture of horizontal ramus anterior to tushes.

Fig 3. Fracture was immobilised by modified interdental wiring (IDW and Transfixation of Pins with Fibre Cast) technique.

pin crossing both the cortexes of horizontal ramus while drilling. The loosening of pin as seen in two cases of present study was due to presence of local infection at the site of embedding of pins in rostral

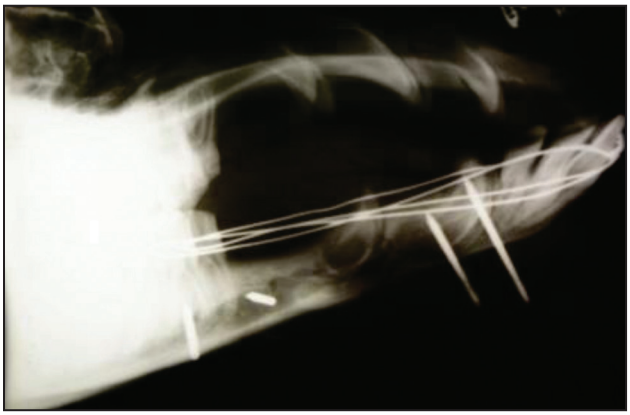

Fig 4. Lateral radiograph of mandible showing adequate reduction and immobilisation of fracture fragments repaired by IDW and transfixation of pins with fibre cast.

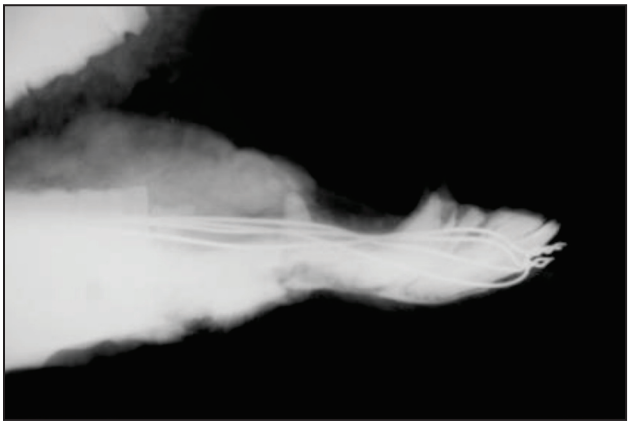

Fig 5. Lateral radiograph showing radiological union of mandibular fracture after removal of Transfixed pins with fibre cast at 7th week.

fractured fragments. However, the fibre cast remained in position. Eventhough, the fibre cast is applied after a careful padding with cotton wool, sometimes it is displaced and leads to bite wounds on the skin due to friction. However, such wounds do not cause a serious complication.

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