

An unusual pattern of a mandibular fracture: Report of two Cases

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Abstract

The incidence of maxillofacial trauma has been on the rise in the developed and developing countries. In maxillofacial region, jaw fractures are frequently encountered because of having various weak areas, which are affected easily when an external trauma occurs.^(1,2) The anatomical features of facial bones make them more susceptible to fractures, mandible being the most prone as compared to other bones.^(2,3,4) The most common etiology for mandibular fracture are road traffic accidents, interpersonal violence, accidental falls, sports injuries, gunshot injuries, etc. The most common site of fracture according to literature is the angle of the mandible, whereas the parasymphysis and the body of the mandible are predominant in others.

Keywords: Mandible fracture, Road traffic accident

Introduction

The incidence of maxillofacial trauma has been on the rise in the developed and developing countries. In maxillofacial region, jaw fractures are frequently encountered because of having various weak areas, which are affected easily when an external trauma occurs.^(1,2) The anatomical features of facial bones make them more susceptible to fractures, mandible being the most prone as compared to other bones.^(2,3,4) The most common etiology for mandibular fracture are road traffic accidents, interpersonal violence, accidental falls, sports injuries, gunshot injuries, etc. The most common site of fracture according to literature is the angle of the mandible, whereas the parasymphysis and the body of the mandible are predominant in others.

Mandibular fractures usually have a predictable pattern, determined by the direction and force of the impact sustained. A blow to the symphysis or parasymphysis of the mandible prompts us to look for fractures in the subcondylar regions, the countercoup phenomenon.⁽⁵⁾ However, high-speed vehicular crashes and gunshot injuries may not present with predictable patterns. Here presenting two cases of high speed vehicular fracture of mandibular symphysis and body of mandible region.

Case Report

Case 1: 29 years old male patient referred our maxillofacial centre with allied history of road traffic accident two days back. There was no history of loss of consciousness, event amnesia, vomiting, ear and nasal bleed. However oral bleed was positive.

In the extraoral examination, laceration on the upper lip and philtrum region, edema, pain was comprehended. Slight edema and laceration were also observed on the lower lip. Intraoral examination revealed laceration in the anterior mandibular region from mandibular left first premolar to mandibular right

first premolar. Step deformity was seen in mandibular symphysis region (Fig. 1). There was avulsion of multiple teeth seen in both the jaws. Gingiva between the teeth was lacerated in the anterior mandible region along with damage to the related hard & soft tissues were mobile. Mandibular left canine was displaced in the vestibule. The occlusion was deranged and patient also complained of difficulty in chewing. Computed Tomography Scan (CT Scan) and routine blood examinations were advised. CT scan of face revealed comminuted fracture of mandibular symphysis region with loss of bony fragments (Fig. 2). CT scan of brain also made to rule out head injury. All the blood reports were within normal limit. After clinical and radiological examination, treatment advised was open reduction with internal fixation under general anesthesia (GA). Patient was intubated & proper debridement of wound was done with betadine mixed with normal saline and hydrogen peroxide followed by upper and lower arch bar placement. Inter maxillary/ maxillomandibular fixation was done to stabilize the occlusion prior to fixation with miniplates. Fracture site was exposed through exiting intraoral contused lacerated wound (CLW) (Fig. 3). Fracture segments were reduced and plating was done with 10-holed continuous (5 screws of 2.0*10mm) and 7 holed reconstruction (5 screws of 2.5*10 mm) plate in the subapical and inferior region respectively (Fig. 4). Suturing was done in layers with 3-0 resorbable suture (Vicryl polyglactin 910) Primary closure was achieved and pressure dressing was given.

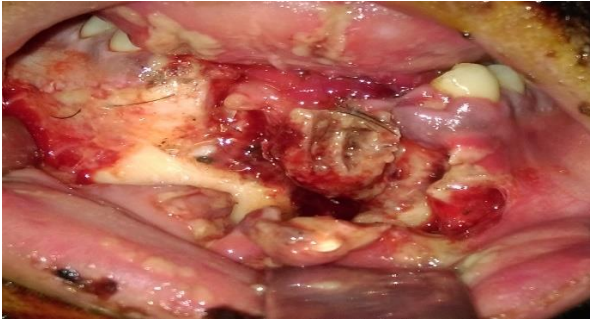


Fig. 1: Step deformity was seen in mandibular symphysis region



Fig. 2: Pre op CT scan



Fig. 3: Fracture site



Fig. 4: Fixation of fractured segments

Case 2: 39 years old male patient came to the hospital with allied history of road traffic accident three days back. There was no history of loss of consciousness, event amnesia, and episodes of vomiting, ear and nasal bleed. On examination extraoral swelling was seen on

the lower right side of face and pain in the same region. Step deformity was seen in mandibular right canine and first premolar. Occlusion was disturbed on both the sides. Patient was advised for Computed Topography scan (CT scan) of brain and cervical spine to rule out any brain and spinal injury (Fig. 5). CT reports reveals fracture between mandibular right canine and first premolar and triangular fracture at the inferior border. Fracture line extending from sigmoid notch anteriorly to mandibular right first molar region. General anesthesia induced and patient intubated. Upper and lower arch bar placement done followed by Inter maxillary fixation to stabilize the occlusion. Local anesthesia was infiltrated and lower vestibular incision was made to expose fracture site. Open reduction with internal fixation was done with 4 holed with gap plate on sub apical and 8 holed continuous plate at inferior border. 4 holed L shaped plate was used vertically at first molar region (Fig. 6). Closure done with 3-0 resorbable suture (Vicryl ployglactin 910) and pressure dressing was given.



Fig. 5: Pre op CT scan

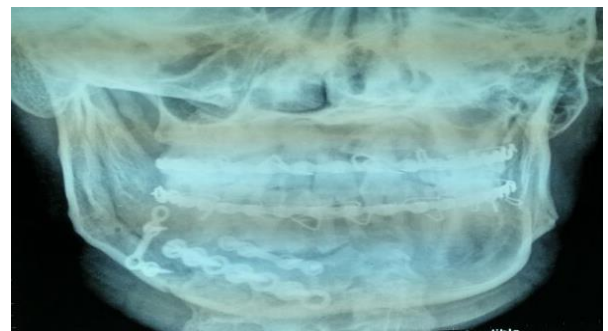


Fig. 6: Post op Radiograph

Discussion

Comminuted fractures of the mandible are an important traumatism, as a result of the extensive degree of violence associated with this injury in which the mandible bone is splintered or crushed, pulverized or broken into several pieces giving rise to many small fragments. Treatment of this type of fracture has always been a challenge to surgeons considering both the severity of this trauma particularly as a result of gunshot wounds and high-speed vehicular crashes.^(5,6) Restoring anatomy of mandible and function along with esthetic appearance of patient is the aim of treatment.

These types of fractures have been treated by using various treatment modalities including closed reduction, external pin fixation, and internal fixation with Kirschner wires and open reduction with internal fixation (ORIF) using miniplates, plates and/or screws. For extensive comminuted mandibular fractures, closed reduction has long been considered to be the optimal treatment to preserve blood supply to the bone fragments and to prevent secondary infections.⁽⁷⁾

Occlusion is the best guide for the alignment of bony fragments and must be established in the first stage of treatment of comminuted mandibular fractures or other midfacial fractures so must be evaluated prior to ORIF. There are authors who recommend open reduction and the use of internal fixation devices such as plates and screws, as being the best way of treating fractures.^(7,8) Therefore closed reductions would result in inter fragmentary movement providing an inadequate environment for cure and open reduction with internal fixation is an absolute indication for the treatment of comminuted fractures.

In accordance with the principles of the Association of Osseosynthesis/ Association for the Study of Internal Fixation (AO/ASIF) the goal of ORIF in the treatment of comminuted fractures of the mandible is to achieve undisturbed biological environment. And it also helps to restore the shape and early return to function without the adjunct use of MMF, by means of absolute immobilization of the bone fragments and primary bone repair, obtained with plates and bicortical screws.^(7,8) Thus, at present, there is discussion about ORIF of mandible fractures, which can be attained by rigid compression (AO/ ASIF) or stabilization (Semi-rigid - Champy). In these techniques the main advantages being the elimination of or reduction in MMF time. A recent report by Smith and Teenier⁽⁸⁾ suggested that open reduction and internal fixation in cases of comminuted mandibular fractures are indicated in (a) severe injuries with significant displacement to allow for the restoration of the pre-traumatic anatomic relationships, (b) edentulous and partially edentulous patient who does not have stable occlusion and may benefit from the open reduction and internal fixation of comminuted fractures, and (c) cases with multiple fractures of the midface, in which the mandible serves as a guide to reposition the midfacial bones. A mandibular reconstruction bone plate can be used to bridge the comminution gap and stabilize the most proximal and distal segments. If major fractured fragments are immobilized, other minor fragments between the major segments can heal well even if unfixated. Comminuted fractures should have load-bearing fixation applied across the area of comminution. The bone fragments within the area of comminution will provide no buttressing to help stabilize the fracture. A reconstruction plate with at least three and preferably four screws on each side of

the comminuted area is the optimal way load bearing fixation is provided.⁽⁸⁾

Conclusion

In the existent literature one observes that there is no consensus concerning the manner of treating comminuted fractures of the mandible. So we recommend the use of long reconstruction plate for comminuted fracture of mandible. Open reduction with internal fixation with large reconstruction plates would provide rigid fixation and with minimum number of complications.

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