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CASE REPORT

Open Reduction and Internal Fixation of Mandibular Fractures

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Abstract:

Mandibular fracture is one of the most common facial skeletal injuries. Although its main causes are road traffic accident and violence, the relation these causes varies from one country to another. The principles of the treatment of mandibular fractures have changed recently, although the objective of re-establishing the occlusion and masticatory functions remains the same. Splinting of teeth is an old way of immobilizing fractures but the advent of modern biomaterials has changed clinical practice towards plating the bone and early restoration of function. This is a case report of displaced fracture parasymphysis on right side and body of mandible on left side which was treated with open reduction and internal fixation using Champy's mini plating system.

Key words: Fractures, Mandibular fracture and Open fractures

Introduction

Mandibular fractures are among the most common injuries to the facial skeleton, with a 6:2 proportion between mandibular and zygomatic fractures. [1,2] The way in which mandibular fractures are treated and repaired has undergone a gradual evolution. Over the years, many techniques for the repair of mandibular fractures have been introduced. The methods have ranged from maxillomandibular fixation (MMF) to combinations of MMF and wire osteosynthesis, lag screw, and plate fixation. Today, rigid internal fixation using compression and noncompression plating systems has gained widespread popularity. [3-11]

CASE REPORT

A 35 years old male patient was referred to Department of Oral & Maxillofacial Surgery, Kamineni Institute of dental sciences with a history of road traffic accident and sustained facial injury with no other systemic problems. Clinical examination revealed swelling in the bilateral parasymphysis region (Fig 1), which was tender on palpation, step deformity was present in the lower border of the mandible bilaterally. Intra oral examination revealed to have deranged occlusion, (Fig 2a) and step deformity of alveolar segments were seen between 34-35 and 43-44. (Fig 2b). The fracture fragment was displaced downwards & buccally leading to anterior open bite. The medical history of the patient was noncontributory. Panoramic radiograph showed a fracture lines between 34-35 and 43-44 with over riding of the fracture fragment. (Fig 3). PA view of mandible showed that the fractured fragment was buccally displaced. (Fig 4). After clinical and radiographic evaluation the case was diagnosed as right parasymphysis and left body fracture of the mandible.

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SURGICAL PROCEDURE

Arch bars were given preoperatively, with upper complete and lower split in three regions between 46-44, 43-34, 35-37. Intraoral labial vestibular incision (Fig.5) was given from 44-42 on right side and same was given on the other side to expose the fracture sites (Fig.6 a,b), then the fracture segments were reduced to anatomical position (Fig.7). After achieving functional occlusion, temporary IMF was done. Then the fractured segments were fixed with two 2mm 4 hole stainless steel miniplates with gap placed at right parasymphysis region (Fig.8) and two 2mm, 4 hole stainless steel miniplates with gap & , 2 hole miniplate were used to fix left body fracture (Fig.9). All plates were secured using 2X8 mm screws.

RESULT

Post operatively after 4 week follow up clinical (Fig.10 a,b,c) evaluation revealed no mobility of the fracture fragment and correction of anterior openbite, and radiographic evaluation revealed proper anatomic reduction of the fracture segments with no other post operative complications.

DISCUSSION:

The primary goal of fracture management is healing of the fractured bone resulting in restoration of form and function. Minimizing infection, malunion, soft tissue breakdown, and technical challenges should be included in the overall management of fractures. Modern traumatology started with the development of osteosynthesis, which was a major step forward in craniomaxillofacial surgery. Before its advent, most mandibular fractures were treated either by approximate fixation using internal stainless steel wires, external fixation using rigid metal pins, or custom-made silver cap splints (cast metal covering of all the teeth in the arch). The first osteosynthesis plate was used by the British surgeon Sir William Lane over 100 years ago. [12] It was not until 1943 that Bigelow described screws and bars made of vitallium—an alloy of cobalt, chrome, and molybdenum—for use in the management of mandibular fractures. [13] Champy anLodde in the early 1970s applied this 'tension band principle' (also referred to as Champy's principle) to the mandible in mathematical, biomechanical, and clinical studies. [14] The first plates were still bulky, and were designed exclusively for use in mandibular fractures.[15] The use of noncompression monocortical miniplate fixation for osteosynthesis of mandibular fractures was introduced by Michelet et al and further advanced by Champy et al.[16] Miniplate osteosynthesis is accomplished by placement of a plate along the so-called ideal line of osteosynthesis, thereby counteracting distraction forces that occur along the fracture line by the supra hyoid group of muscles during mandibular function. In the mandibular angle region, this line indicates that a plate may be placed either along or just below the oblique line of the mandible. Advantages of rigid internal fixation include avoidance of MMF, early functioning of the mandible, increased patient satisfaction, shorter periods of hospitalization, and earlier return to the workplace.

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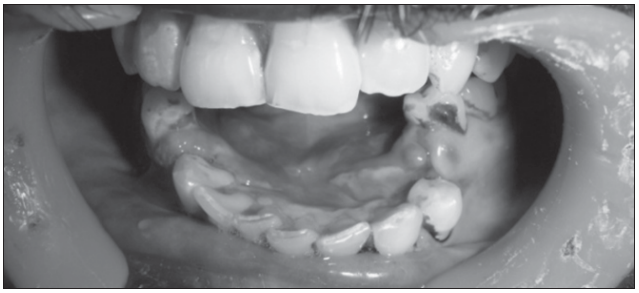

Fig. 1: Pre Operative

Fig. 2: Intro Oral Incision Placed

Fig. 3: Pre Operative OPG

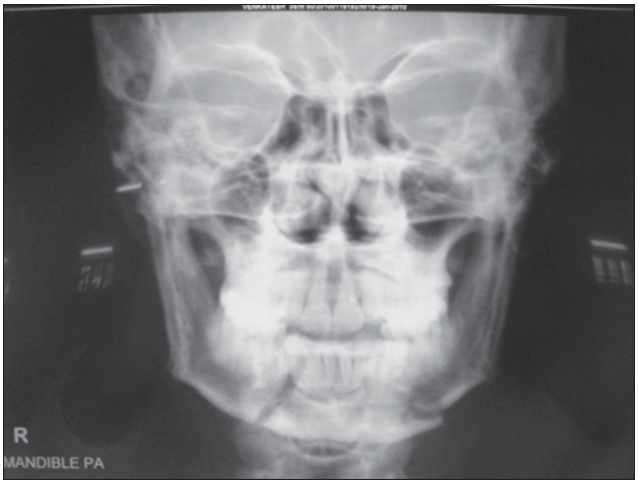

Fig. 4: Right and Left Fracture segments seen

Fig. 5: Fracture segments were reduce to anatomical position

Fig. 6: Exposer of Facture segments

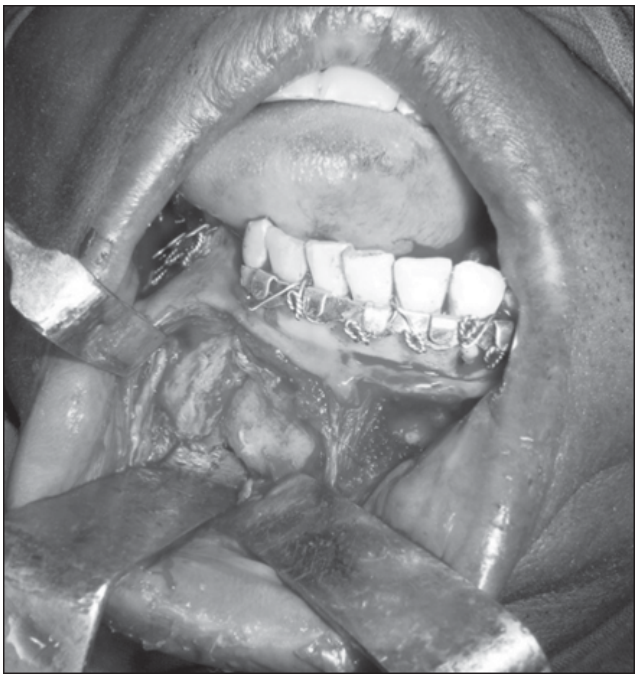

Fig. 7: Reduction of Facture Fragments

Fig. 8: Post operative occlusion

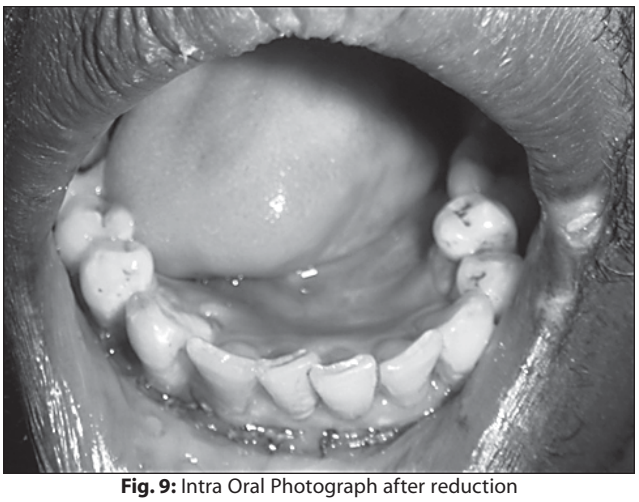

Fig. 9: Intra Oral Photograph after reduction

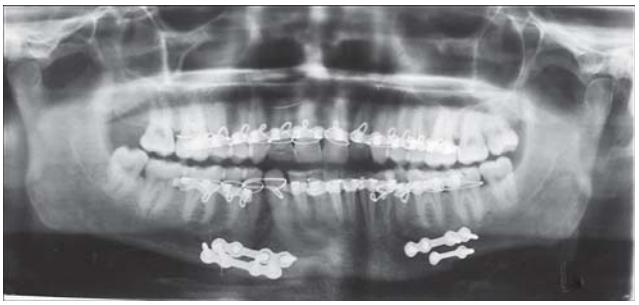

Fig. 10: Post Operative OPG