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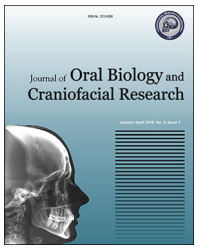

Original Article

Comparison of 2 mm single locking miniplates versus 2 mm two non-locking miniplates in symphysis and parasymphysis fracture of mandible

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ABSTRACT

Introduction: The purpose of this study is to compare the efficacy of single 2 mm locking miniplates versus two 2 mm non-locking (conventional) miniplates in symphysis and parasymphysis fracture of mandible.

Method: This present study included 40 patients of maxillofacial trauma having mandibular symphysis/parasymphysis fractures in which open reduction and internal fixation is indicated. Patients were selected according to the inclusion criteria and divided into two groups, i.e. Group 1: consisted of 20 patients, requiring open reduction and internal fixation with 2 mm two non-locking titanium plate and Group 2: consisted of 20 patients, requiring open reduction and internal fixation with 2.0 mm single ultra-locking titanium plate. Fracture was then stabilized and postoperative clinical examination was carried out on 3rd day, 1st, 2nd, 4th, and 8th week.

Result: Results of this study suggested that the use of single 2.0 mm locking miniplate could be a viable option instead of using two miniplates in anterior mandibular fracture as advocated by Champy, as it provides equally good outcome along with placement of lesser implant material.

Discussion: Single locking miniplates give the advantage of equally good stability and early restoration of function with almost similar results as seen in osteosynthesis with two miniplates. It was also found that less precision was required in plate adaptation when using single locking miniplate. This study suggests that there is not much difference in surgical

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outcome with the use of either single locking miniplate or two conventional miniplates in anterior mandibular region.

1. Introduction

''Love of life is next to love of our own faces'' – Sushruta – 600 B.C.

Face being the most admired point, defacement due to trauma or otherwise would greatly affect a person both bodily and psychologically. For this reason, any disfiguring trauma or defect to maxillofacial region needs urgent and skilled management. The cause of maxillofacial injuries varies from one country to another and even within the same country depending upon the existing socioeconomic, cultural, and environmental factors. Road traffic accidents are gaining new heights in developing countries like India, with increase in urbanization, hasty arrival of high-speed automobiles, and poor road conditions resulting in increase in incidence of traumatic injuries to the maxillofacial skeleton.[1]

Mandible, in spite of being the largest and strongest facial bone, by asset of its position on the face and its prominence, is frequently fractured when maxillofacial trauma is sustained. There is variety of anatomic and biomechanical reasons for this incident. Osteology of mandible, the muscular attachments and their influence, and presence of developing and developed dentition play an imperative role in producing the inhere-tent weakness and making secluded areas of mandible more vulnerable to fractures. These secluded areas of weakness include angle, sub-condylar region, and symphysis and parasymphysis region. The cantilevered nature of angle region, constriction of neck in sub-condylar region, presence of mental foramen, and long socket of canine tooth contribute to the compromised potency of mandible in these regions.[1–3] The anatomy of mandible and vector of forces exerted by the masseter and temporalis muscles make symphysis/parasymphysis fractures predominantly challenging. These vector forces take apart the inferior border of the mandible at the site of fracture. With the advent of rigid internal fixation for mandibular fractures in the 1970s, the concepts of favorable and unfavorable have gone by the wayside, and have been substituted by the new concepts of regions of tension and compression, i.e. tension at superior border and compression at inferior border. This concept of tension and compression holds true for body and angle fractures, but in symphysis/parasymphysis region, there are overlapping tensile and compressive loads in both the directions. Besides, these torsional forces are also significant. Taking these anatomical factors into account, in the anterior region between the mental foramina, in addition to sub-apical plate, another plate near the lower border of mandible is necessary in order to neutralize torsional forces and this second plate is applied parallel to first plate with a gap of 4.5 mm between them.[3]

Conventional bone plate/screw systems require precise adaptation of the plate to the underlying bone but with the introduction of locking plates, the disadvantages of conventional miniplates have been overcome.[4–10] Thus, miniplate fixation of mandible fractures along the 'ideal lines of osteosynthesis' and advantages of locking miniplate over conventional ones have prompted us to compare the efficacy of single 2 mm locking miniplates versus two 2 mm non-locking miniplates in symphysis and parasymphysis fracture of mandible in patients treated in our department.

2. Materials and methods

After taking ethical approval from institutional authority, 40 cases of symphysis and parasymphysis fracture with or without associated fracture elsewhere in the mandible or mid-face who reported to our department, to be treated by open reduction and internal fixation were included in the study. A well informed and written consent was obtained from all patients included in this study to use their photographs/particulars for discussion and display. The patients were then randomly selected for choice of plating system viz. 2.0 mm single ultra-locking titanium plates with 2.0 mm ultra-locking screws or 2 mm two non-locking titanium plates with 2 mm screws. In all cases, a thorough history was recorded along with patient's health history to rule out significant systemic conditions that would have a bearing on patients' treatment protocol. Detailed clinical examination was carried out as per the protocol. Radiographic examination included the posterior anterior view of mandible and the ortho-pantomogram (OPG). Additional radiographic projections, if indicated were obtained. The radiographs were thoroughly assessed before any surgical treatment and choice of plating system. All patients selected in the study were randomly divided into 2 groups irrespective of any bias.

- Group 1: consisted of 20 patients who had undergone open reduction and internal fixation with 2 mm two non-locking titanium plate (Figs. 1–4).
- Group 2: consisted of 20 patients who had undergone open reduction and internal fixation with 2.0 mm single ultra-locking titanium plate (Figs. 5–8).

Follow-up period was of at least 8 weeks, in which the patients were periodically recalled on 3rd day, 1st, 2nd, 4th,

Fig. 1 – Pre-operative occlusion.

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