

ORIGINAL RESEARCH

Apraisement of Micro Plates and Mini Plates in Maxillofacial Trauma

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ABSTRACT

Background: facial injury has led to furtherance in techniques of internal fixation, improvements in plating system. Trauma to the facial bones and exposure of the site and internal fixation with micro and mini plates. Evaluating 10 patients with fractures of maxilla and mandible and open reduction and internal fixation with and comparison of micro and mini plates with load bearing capacity, stability at the fracture site and postoperative complications. **Objectives:** Comparison of micro and mini plates in maxillofacial trauma cases.

Materials and Methods: Sample consists 10 subjects, 5 each in two groups clinically and radiographically diagnosed with Group 1 (maxillary fractures) and Group 2 (mandibular fractures) which were subdivided into 5 each treated with miniplate and microplate respectively. All cases have been evaluated clinically for various parameters for minimum of 1 months 2 month and 3 months of assessment of any postoperative complications. Post operative evaluation for pain and fracture site stability and post of infections, mouth opening, wound healing was observed.

Results: Study resulted as microplates are more and enough stability and have good adequate capacity of adaptation when compared with mini plates because of flexibility of plate and less size of the microplates feels less hard than mini plates when used in maxilla.

Conclusion: Microplates have good adequate adaptation and rigid enough to provide adequate stability of the fracture segment when compared with mini plates, many number of fractures evaluation in maxilla and mandible finally concluded microplates are good at maxilla fixation and mandible.

Keywords: Fixation, Mandible, Maxilla, Microplate, Miniplate.

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INTRODUCTION

The prevalence of maxillofacial injuries varies from 17% to 69%, and this large difference might be due to various environmental factors, socioeconomic conditions, cultural reasons, and traffic rules.^[1,2] About 1.25 million people die each year as a result of road traffic

accidents (RTAs) out of which the frequency of all-terrain vehicle collisions and motor cycle accidents constitute about 32% with 8% of maxillofacial injuries, mean age being 31 years with more male victims over female.^[3-5]

Feller et al. performed biomechanical studies and suggested that a combination of miniplate and microplate provided sufficient stability for complication-free healing of fractures. Gupta et al. studied the bite forces with such combination and confirmed the findings of the Feller.^[6,7] This was, in fact, an effort to advocate the minimum use of hardware. This effort must have minimized the metal leaching also. The size of hardware should be optimized not only to resist the masticatory stresses, to provide sufficient stability to the bone segments and restoration of normal masticatory function but also to leaching of metal.

Evans et al performed their studies and suggested the role of miniplates and microplates in treatment of mandibular and midfacial fractures.^[8] Microplates are used for internal fixation of MFFs as they require less manipulation and are associated with lower likelihood of iatrogenic damage than miniplates that justifies the ability to maintain anatomic apposition of the bone segments, which translates into functional and aesthetic results jeopardizing the fracture stability and the cost of system.^[9,10]

Hence, we decided to conduct a clinical prospective study to evaluate of microplates over miniplate osteosynthesis in terms of occlusal stability, wound healing, post operative infections.

MATERIALS & METHODS

The study group in this investigation consisted of 10 treated patients who presented to the Department of Oral and Maxillofacial Surgery, St. Joseph Dental College, Eluru for surgical fixation of maxilla and mandible with micro and mini plates.

RESULTS

Table 1: Maxillary site

Site of the maxillary fractures	
1. infra orbital rim	Male / female 1
2. zygomatic complex Mini plates	1 2
3. supra orbital rim	1

Table 2: mandibular site

Site of the mandibular fractures	
1.Symphysis	Male / female 1
2. Angle Mini Plates	2
3. Parasymphysis	1
4. Body	1

A total of 10 patients were evaluated. Distribution was on the basis of the type of maxillary and mandibular fracture [Table1 and 2], treated with mini/microplate. Group 1A-Maxilla (Miniplate), Maxilla (Microplate/ mini plates), Mandible- (Miniplate/micro plates), Statistically significant values in terms of palpability Maxilla (Microplate) and Mandible (microplate). When load bearing capacity and was measured with occlusion stability for three months postoperatively in all groups, it was insignificant in the first month for microplate groups, which was less compared to the miniplate groups due to occlusal self-adjustability.

Percentages	0	50	100
Occlusion Stability	Micro plates		
	Mini plates		
Plate Adaption	Mini plates		
	Micro plates		
Mouth Opening	Mini plates		
	Micro plates		

DISCUSSION

Anand et al,^[11] reported that the assessment of the fracture stability showed favorable results, whereas one (10%) patient from each study group had mild occlusal derangement; moreover, two patients in the miniplate group developed infection. Kumar et al,^[12] observed that patients treated with locking plate/screw system postoperatively generated more bite force compared to those treated with conventional miniplate screw system. However, they have not highlighted the significance of their findings in statistical terms. The increase in bite force may be due to mechanical advantage provided by locking plate.

We performed a study in 10 patients dividing them into two main groups treated with miniplate and microplate in maxillary and mandible on the parameters such as pain, facial asymmetry, occlusion, wound dehiscence, need for postoperative MMF, and mouth opening. Follow-up was carried out till 3 months. In our study, pain persisted for both groups, maxilla and mandible, treated with miniplate and microplate which was same till the 1st week and 2nd week and gradually pain decreased till the end of the 3rd month postoperatively. No statistically significant difference was found among these groups. no significant difference in pain in their studies treated with mini and microplate. We found the use of microplates can be considered in the management of facial fractures indicating minimum use of hardware, less bone plate ratio, fracture stability, less wound dehiscence, and adequate strength at the fracture site and resulting in reduced risk of nerve damage. The maximum occlusal force is reduced with fractures within the masticatory system, so the measurement of the biting force was used to compare between different plating systems in the management of mandibular fractures and to determine the rate of recovery of the biting force to the normal functional range.^[11,13]

Complications of the included studies were recorded within the acceptable level associated with the traditional techniques of ORIF, without significant difference between both the microplate and miniplate groups. Although the cost is the main disadvantage of titanium microplates, they have better mechanical properties and smaller dimension and less cost than resorbable plates.

CONCLUSION

All the procedures were performed by using a standard method to accomplish the evaluation of micro plates and mini plates. In microplates have high holding capacity were found for internal fixation of simple, minimally displaced, isolated mandibular fractures, 1.5 mm microplates are rigid enough to provide adequate stability to the fractured segments which is comparable to miniplates in the isolated fractures of mandible and should be preferred over miniplates.

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