Mandibular Fracture

Original Article

Mandibular Fracture Fixation with Miniplate and MMF for up to two weeks.

A Prospective Study

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ABSTRACT

Objective: This study was conducted to evaluate the complication rate of treatment of mandible fracture using 2.0-mm miniplate and MMF for up to two weeks.

Study Design: Descriptive study.

Place and Duration of Study: This study was conducted at Liaquat University of Medical and Health Sciences Jamshoro, Hyderabad Sindh from May 2004 to April 2006.

Patients and Methods: Fifty patients with single mandibular fracture were evaluated in this study at Liaquat University of Medical and Health Sciences Jamshoro, Hyderabad Sindh. Single miniplate was applied according to champy's principle of osteosynthesis and secured with four mono cortical screws and Maxillomandibular fixation was applied for up to two weeks. Follow up was done for at least eight weeks after surgery. The incidence of infection, malocclusion, delayed union, non union, nerve damage and TMJ dysfunction were evaluated.

Results: Bone union was achieved in all patients. No evidence of malocclusion, delayed union, nonunion, nerve damage and TMJ dysfunction observed. Two cases (4%) developed post operative infection and was healed with in 7 to 10 days after administration of antibiotics and local wound care.

Conclusion: Single miniplate along with Maxillomandibular fixation for up to two weeks has proven to be the most effective treatment modality for mandible fracture.

Key Words: Mandible fracture, Miniplate, MMF, post operative complications.

INTRODUCTION

Fracture of the mandible can be treated by variety of methods. 1-6 Each method has its inherent complications.⁷⁻¹² These are infection. malocclusion, delayed union, non union, nerve damage, TMJ dysfunction, reduction in ventilatory volume and occurence of pulmonary atelectasis.

Previously traditional methods of maxilla mandibular fixation were the most popular used for mandibular fracture fixation. These are still commonly used methods. today Maxillo mandibular fixation has considerable disadvantages to the patient of preventing normal jaw function and restricting the diet to liquid or semi solid. Weight loss is common, oral hyagine maintenence is difficult, reduction in ventilatory volume and difficulty in clearing pharyngial secretions may leads to occurence of pulmonary atelectasis.12

For all these reasons and increased awareness about esthetic and optimized need for earliest functional recovery of life has posed maxillofacial surgeons to innovate surgical techniques to provide better option in the management of mandibular fracture. Rigid internal fixation by miniplates has challenged the traditional methods of treatment by inter maxillary fixation.

Treatment of fracture mandible by miniplate fixation is most widely used and universally accepted method of fracture fixation. But it has also considerable disadvantages. Postoperative infection, malocclusion and iotorogenic injuries has been reported in previous studies. In this study single 2.0-mm titanium miniplate with 4 mono cortical screws was placed along champy's line of ideal osteosynthesis via transoral approach plus maxillomandibular fixation for upto 2 weeks for mandibular fractures.

MATERIALS AND METHODS

Single mandible fractures in fifty patients were evaluated at Liaquat University of Medical and Health Sciences Hospital Jamshoro, Hyderabad Sindh. Between May 2004- April 2006. There were 45 male patients and 5 female patients (are shown in figure 1) between 14-48 years of age (mean age 25 years). Fracture distribution was 14 symphysis fractures 24 para symphysis fracture 12 body fractures. Fractures were treated with in 3 days after the incidence of injury. Patients having single mandibular fracture, medically fit for surgery and MMF, having sufficient dentition to allow maxillomandibular fixation and assess occlusion

were included in this study. Patients with bone pathology, immunocompromised states, comminuted and infected fractures were excluded from this study.

For maxillomandibular fixation 2% lignocaine with 1:100,000 adrenaline was administered for obtaining local and regional anaesthesia. Extraction of teeth performed if indicated. Maxillomandibular fixation was placed using arch bar in mandible and maxilla. For miniplate fixation under general anesthesia in aseptic condition intraoral mucosal incision was made miniplate fixation was done with 2-mm wide, 7-mm long four monocortical screws along champy's line of ideal osteosynthesis. Care was taken to avoid injury to teeth and neurovascular bundle during placement of screws. Surgical site was irrigated with normal saline, incision was closed with simple intrupted sutures and no drains were placed. IV Antibiotics were given to all patients. Post operative radiographs were taken in all cases. All patients were kept for follow up for at least two months. During follow up, patients were observed for infection, malocclusion, delayed union, non union, nerve damage, and TMJ dysfunction. Collected data was analysed by SPSS statistical package version 17 on computer. The significance test was chi-square and ttest with p-value (p>0.05).

RESULTS

Bone union was achieved in all patients. No evidence of malocclusion, delayed union, non union, nerve damage, and TMJ dysfunction were observed. Two patients (4%) faced complications of wound infection and were managed by local wound care and antibiotics administration and both were healed satisfactorily with in 7-10 days. Details about complications are given in Table:1.

Table No.1: Frequency of complications.

Complications	No: of Patients	Percentage %
Infection	2	4%
Malocclusion		
Delayed Union		
Non Union		
Nerve Damage		
TMJ Dysfunction		

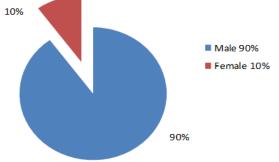


Figure No.1: Male to Female ratio

DISCUSSION

Various studies has been observed on the use of miniplates for the treatment of mandibular fractures ¹³⁻¹⁷. Berry CP¹⁸ treated mandibular angle fracture with one miniplate at superior border without MMF, 12% of patients developed complications that required Bone plate removal. Ellis¹⁹ treated mandibular angle fracture with one miniplate at superior border without maxillomandibular fixation, 16% of patients reported complications. In various other studies mandibular miniplate treated by fractures fixation maxillomandibular fixation for shorter duration found satisfactory bone healing with decreased rate of complications (3.4-6%).²⁰⁻²² In this study one miniplate placed in all regions of mandibular fracture and maxillomandibular fixation for short duration (up to two weeks) has these advantages.

Reduction in implant material, Ideal occlusal adjustment with maxillomandibular fixation, Palpability & thermal sensation of miniplate further decreased by use of single miniplate, Less chances of interference with radiography, Less exposure time during surgery decreases contamination of deeper tissues & Two plates causes greater restriction of post operative occlusal adjustment if required.

Reduction in over all complications minimize the need of second surgery for removal of miniplate. For all these reasons use of single miniplate placement with maxillomandibular fixation for initial few days is superior treatment option for non comminuted uninfected mandibular fractures.

Results in this study regarding postoperative complications are comparable with that of international data, Bolourian R^{20} and Chirtab A. 21

CONCLUSION

The use of intra Oral single miniplate secured with 2-mm wide 7.0-mm long mono cortical screws according to champy's principle of osteosynthesis and maxillomandibular fixation using arch bar in mandible and maxilla for upto two weeks is most effective treatment and has several advantages with least number of complications.

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