Original Article

Comparison of Two Techniques of Mandible Fracture Fixation Regarding Their Postoperative Complications

Techniques of Mandible Fracture Fixation

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ABSTRACT

Objective: The objective of our study was to compare complications of fracture mandible treated by miniplate only and miniplate plus maxilla mandibular fixation (MMF).

Study Design: Comparative Study

Place and Duration of Study: This study was conducted at Liaquat University Hospital Hyderabad from May 2007 to April 2008.

Patients and Methods: This study was conducted on (100) one hundred patients of single mandible fracture. Patients were distributed into two groups (Group A and Group B). Patients in group A fracture, fixation was done by miniplate fixation and patients in group B were managed by miniplate plus MMF for upto 15 days. All patients were followed after surgery for at least two months. Incidence of development of infection, nonunion, malocclusion, nerve damage, TMJ dysfunction and delayed union was evaluated.

Results: Bone union was occurred in all patients. Ten complications were developed in ten patients. In group A number of complications were 8 (16%) and in Group B number of complications were 2 (4%).

Conclusion: Rigid internal fixation in the form of miniplate plus MMF for shorter duration is advantageous as it has good function result and lesser number of compactions.

Key Words: fracture mandible, category of treatment, complications

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INTRODUCTION

Maxillofacial injuries are the most common types of injuries presenting at emergency departments.[1-3] Maxillofacial trauma is main cause of mortality and morbidity worldwide. [4-6] Mandible is the single bone of facial skeleton which take part a major action in mastication, speech and deglutition. The most prominent bones of face are mandible and zygomatic bones and both are more vulnurable to trauma and fracture. [7-11] Fractyre of these bones may occur alone or in combination with other facial bone fractures. [12-15] [15]Its fracture may affect its function and cause disfigurement. Pattern of mandibular fractures may be affected by geographic location, social, cultural and environmental factors and social activity. [16-18]

Most common cause of mandibular fracture in developing countries is road traffic accidents due to lack of implementation of the traffic laws, while contrastingly in developed countries alcohol related to interpersonal violence and physical assault is the chief cause of mandiblular fracture. [18-22]

Treatment of fracture mandible remains a challenge demanding skill and high level of expertise. Fracture mandible can be treated by close or open reduction and fixation.[23-27] It has been reported that different complications can occur after close and open reduction and fixation.[28-33] Previously close reduction methods were most popular used for mandibular fracture.[34-36] MMF has many difficulties for patients of preventing normal jaw function, restricting the diet to liquid or semisolid and difficult maintains of oral hygiene. Recently rigid internal fixation has gain popularity in treating fracture mandible by use of miniplates and screws.

Infections, malocclusion, delayed union and even some time nonunion, nerve damage and reduction in ventilatory volume followed by occurrence of pulmonary atelectasis may occur after close and open reduction of fracture are [26,33].

MATERIALS AND METHODS

This study was carried out on one hundred patients visited Liaquat University Hospital Hyderabad from May 2007 - April 2008. There were 89 (89%) males and 11 (11%) females. Most common site was para symphysis(50%.)

Fractures were treated after the incidence of injury within 72 hours. Patient having single mandibular

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fracture, medically fit for surgery and having sufficient dentition to assess occlusion were included in our study. Patients having bone pathology, immune-compromised patient's and patients with comminuted and infected fractures were excluded.

Patients selected by above inclusion and exclusion criteria were distributed into two groups. Patients in group A were treated by Mini plates and patients in group B were treated by mini plates + MMF for up to 15 days. Under general anesthesia intraoral mucosal incision was made in aseptic conditions, fracture was reduced and pretraumatic occlusion was established, miniplates placed & secured with four 2.0 mm wide 7.0 mm long mono cortical screws following Champys principle. Surgical site was irrigated with normal saline, incision closed and antibiotics were given to all patients. Post-operative radiographs were taken. All patients included in the study were followed for at least two months. During follow up patients were examined for post-operative complications. Collected data was analyzed by using SPSS version 17. Chi-square and T-test significance test were used with P-value (P>0.05).

RESULTS

Table No.1: Distribution of Mandible Fracture Site

Site	No. of Patients	%ages
Symphysis	16	16%
Para Symphysis	50	50%
Body	24	24%
Angle	10	10%

Table No.2: Frequency of Complications

Complication	Miniplate	Miniplate + MMF	Total
Infection	8%	4%	12%
Malocclusion	6%	0%	6%
Delayedunion	0%	0%	0%
Non Union	0%	0%	0%
Nerve Damage	2%	0%	2%
TMJ dysfunction	0%	0%	0%
Total	**16%**	**4%**	**20%**

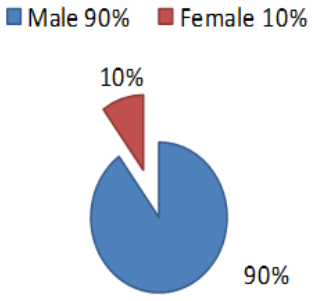

Figure No.1: Distribution of Male and Female

In our study 89% were males patients and 11% were females (figure-1)). Most common age group of the patient was 21-30 years. Most common cause of mandibular fracture found in our study was Road traffic accidents. Union and bone healing of fractures were achieved in all cases. Ten complications encountered in 10 patients among two groups (100 patients). Distribution of mandibular fracture site is shown in table 1 and details about post-operative complications are given in Table 2.

DISCUSSION

In our study road traffic accident was found common cause of fractures. Young adult males (21-30) years of age were prominent victims. Parasymphysis was found most common site of fracture. The results of epidemiologic surveys on the causes, incidence and distribution of mandibular fracture vary with geographic regions, socio economic conditions and culture characteristics. [5-13.] The relatively high male to female ratio in our study is due to the fact that males are engaged more in outdoor activities while females are confined to indoor activities in this part of world.

Previous Studies Conducted to compare the close reduction by MMF with open reduction and fixation. Cowood[37] and Renton[38] have also found the rigid Internal Fixation as the treatment of choice.

Several Other studies show the maxillomandibular fixation superior regarding post-operative complications[34-36]. Recent studies conducted by Balourian[39] and Chiritab[40] used maniplates + MMF for fewer days (1-2 weeks) and found lesser Complications. Result in this study regarding postoperative infection in group A was 8% and in group B was 4% are comparable with that of previous studies done internationally. Infection in miniplate use was found by Demotos[26] and Barry[41], 8%, Pazaoa[24] 9% and Sauerbier[42] found 7.5% respectively.

Mobility of fractured segments, placement of screw in the line of fracture, poor plate adaptation and contouring, inadequate cooling during preparation of holes for insertion of screws and tooth in fracture line increases the risk of post-operative infection. Lack of antibiotics used considered to be predisposing factor for infection.

In group A infection was double then group B. It favors that in group B single miniplate was used along with MMF for up to fifteen day has reduced infection rate, possible because of reduction in implanted material minimized procedure errors.

In this study malocclusion Occurred 6% in group A and non of patient in group B faced this complication. Regarding Malocclusion in Group A our results are matching with that of Previous Studies[19, 22]. Presence of malocclusion depends upon patients' dental condition, number of fractures and their displacement, achieved reduction, kind of Immobilization and the time of immobilization and inappropriate bending and adaptation of plates. This study favors that Miniplate Fixation + MMF for up to two weeks achieves

reduction of fracture that is sufficient to obtain good post-surgical occlusion. Rigidity of osteosynthesis material is an advantage because it allows immediate jaw mobility but it can also be a draw back if it prevents correction of a post-operative malocclusion with MMF. Malocclusion was corrected by occlusal grinding. Group A showed sensory disturbances in 2% of patients that is matching with the study of Schon[23] and is probably due to manipulation of fractured segment in the placement of two miniplates at parasymphysis region. While in group B we used one miniplate and none of patient faced this complication.

CONCLUSION

Rigid internal fixation in the form of miniplate plus maxillomandibular fixation for shorter duration is advantageous as it has good functional results and lesser number of compactions.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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