ORIGINAL ARTICLE

COMPLICATIONS ASSOCIATED WITH DIFFERENT TREATMENT MODALITIES OF MANDIBULAR FRACTURE

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ABSTRACT

The aim of this study was to compare the complications of various techniques used to treat mandible fractures. This clinical study was carried out on 150 patients of mandibular fracture at Liaquat University of Medical & Health Sciences Hospital Jamshoro, Sindh from May 2004 to April 2006. Inclusion criteria were patients having single mandibular fracture, were medically fit for surgery, and had sufficient dentition were selected for maxillomandibular fixation. Patients with bone pathology, immnocompromised, comminuted and infected fracture were excluded. They were distributed in three groups and were treated with three standard techniques. Miniplates, MMF (maxillomandibular fixation) and Miniplates + MMF for 15 days. Age ranged from 12-60 years, mean age was 26.5 years. There were 135(90%) males and 15(10%) females. Most common site was parasymphysis (48%). Post operative complications were recorded as infection, malocclusion, delayed union, nonunion, nerve damage and TMJ Dysfunction. 21 complications were encountered in 21 patients among all three groups. In MMF group number of complications were 11 (22%). In Plating group were 8 (16%). In plating + MMF group were 2 (4%). The use of miniplate secured with four 2.0mm wide and 7.0mm long monocortical screws and maxillomandibular fixation for two weeks has proven to be the most effective treatment modality for mandible fracture.

Key Words: *Mandible fracture, Modality of treatment, Postoperative complications.*

INTRODUCTION

The management of fracture mandible remains a challenge for oral and maxillofacial surgeons demanding skill and high level of expertise. Treatment ranged from close reduction with maxillomandibular fixation to open reduction with rigid and semi rigid fixation.[1-3]

Different complications have been reported which may occur after the close and open reduction and fixation. These are infections, malocclusion, delayed union, non union, nerve damage, TMJ Dysfunction and reduction in ventilatory volume and occurrence of pulmonary atelactasis.[4-13]

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The present study was carried out to evaluate the complications associated with various techniques used to treat mandible fractures.

METHODOLOGY

This study was carried out on one hundred fifty patients treated at Liaquat University of Medical and Health Science Hospital Jamshoro, Hyderabad from May 2004-April 2006. There were 135(90%) males and 15(10%) were females with male to female ratio 9:1 (Fig 1). Age ranged from 12-60 years. Most common age group was 21-30 years. Mean age in the study group was 26.5 years. Most common fracture site was Parasymphysis accounting for 48%. Fractures were treated within 72 hours after the incidence of injury. Inclusion criteria were patients having single mandibular fracture and were medically fit for surgery, patients with sufficient dentition and had assess occlusion were selected for MMF. Patients with bone pathology, immnocompromised, comminuted and infected fracture were excluded.

Patients selected by the above inclusion and exclusion criteria, were distributed into three treatment

groups and were treated with three of the standard techniques Miniplate fixation, MMF and Miniplate + MMF for 15 days. Fifty patients were included in each group.

For maxillomandibular fixation 2% lignocaine with 1:100,000 adrenaline was administrated for getting local and regional anaesthesia. Maxillomandibular fixation was done using arch bar in mandible and maxilla. For miniplate fixation, in aseptic conditions under general anaesthesia intra oral mucosal incision was made, fracture was reduced, pretraumatic occlusion established, miniplates placed and secured with four 2.0mm wide 7.0mm long monocortical screws following Champy's principle. Surgical site was irrigated with normal saline, incision was closed and no drains were placed. Antibiotics were given to all patients. Post operative radiographs were taken. All patients included in the study were followed for at least eight weeks. During follow up patients were examined for post operative complications including infection, malocclusion, delayed union, non union, nerve damage and TMJ Dysfunction. Collected data were analysed by SPSS statistical package version 17 on computer. The significance test used was chi-square and t-test with P-value ($p>0.05$)

RESULTS

Fracture union and bone healing was achieved in all cases. 21 complications were encountered in 21 patients among all three groups (150 patients). Complications occurred in each group. Distribution of fracture sites are shown in Table 1 and details about post operative complications related to different treatment modalities are given in Table 2.

DISCUSSION

Several studies have been conducted to compare the traditional methods e.g mmf with the newer techniques e.g miniplate.[12-18]

Cawood[12] and Reton TF[13] have supported the rigid internal fixation as the treatment of choice .On the other hand Lamphier J[14], Moulton Br[15] and leach J[16] have found the traditional techniques superior to the newer techniques regarding post operative complications. Balourian R[17] and Chritab A[18] used Minipletes+ MMF for few days and found lesser complications.

Results in this study regarding post operative infection are comparable with that of international data. According to Demotos FP[4] and Barry PC[19] infection in miniplate use was 8%, Pazaoa[2] 9%, Sauerbier S[20] 7.5%. Infection rates in MMF is matching with Moreno JC[5] 4%, Lamphier J.[14] Higher infection rates in plating group is most probably due to the direct intraoral contamination of the fracture site. The patients with post operative infection were treated with irrigation of fracture site and use of antibiotics and were relieved in a week time.

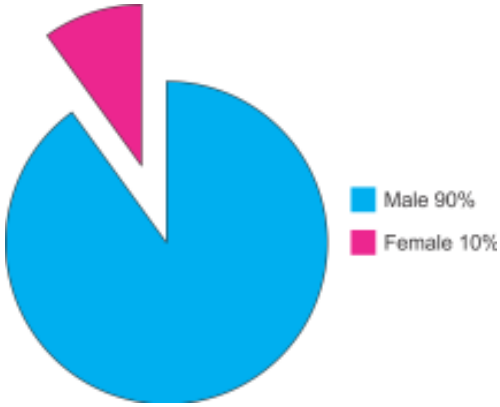

Fig 1: Male to female ratio

TABLE 1: DISTRIBUTION OF MANDIBLE FRACTURE SITES

Site	No. of patients	Percentage
Symphysis	24	48%
Parasympysis	72	22.6%
Body	34	16%
Angle	20	13.3%

TABLE 2: FREQUENCY OF COMPLICATION IN EACH CATEGORY

Complications	Miniplate	M.M.F	Miniplate + MMF	Total
Infection	8%	2%	4%	14%
Malocclusion	6%	4%	—	10%
Delayed union	—	6%	—	6%
Nonunion	—	—	—	—
Nerve damage	2%	—	—	—
TMJ-Dysfunction	—	10%	—	10%
Total	16%	22%	4%	42%

In the present study result regarding malocclusion are comparable with studies done by Sauerbier S[20] 6% in plating group, Blourian R[17] observed no malocclusion in plating + MMF group. No doubt rigidity of the osteosynthesis material is an advantage as it allows immediate jaw function but it can also be a drawback as it prevents correction of post surgical molocclusion.[5] Plating +MMF for few days achieve reduction of the fracture that is sufficient to obtain good post surgical occlusion.

Delayed union occurred in 6% in MMF group but none in the plating and plating + MMF group. These findings are similar to those of Reton TF[13] and cawood JI[12]. Union was achieved only by prolonging the MMF period. None of the patient faced non union among all three groups.

Motor and sensory neuropathies were noted. Miniplate group showed sensory disturbance in 2% of patients. Findings of current study regarding sensory disturbance in plating group is matching with that of Schon R[22](3%).

In the present study none of the patient recorded any nerve involvement in plating +MMT group as reported by Balourian R[17] and Chiritab A[18].

10% Trismus was encountered in MMF group only and is comparable to those of Moreno JC[5] and Jonzales.[22] Post operative exercise (wooden spatula) was advised in these patients and all were relieved in 10 days. None of the patients faced this complication in plating and platting +MMF group.This is supported by the study of Anderson[24] and Moreno JC[5]. In this study use of single miniplate+MMF upto 15days showed least number of complications.

CONCLUSION

It was concluded that rigid internal fixation in the form of miniplate and MMF for short duration is advantageous and showed lesser complications as compared to plating and MMF.

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