COMPARISON BETWEEN EXTRA ORAL AND INTRAORAL SURGICAL PROCEDURES FOR THE MANAGEMENT OF MANDIBULAR ANGLE FRACTURES

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ABSTRACT

Objective: To evaluate and compare the treatment outcomes of isolated mandibular angle fractures managed by open reduction and internal fixation using intra oral and extra oral approaches.

Study Design: Randomized control trial.

Place and duration of Study: Department of oral and maxillofacial surgery, Liaquat University Hospital Hyderabad, from May 2011 to Nov 2011.

Patients and Methods: The patients who presented with isolated mandibular fracture were selected according to inclusion criteria. The diagnosis was made by standard history, clinical examination and radiographic investigations. The patients were randomly divided into two groups, A and B. Group A patients were managed by extra oral approach and group B patients were managed using intra oral approach. The patients were prescribed antibiotics for one week and follow up was carried for four weeks. Nerve damage, limited mouth opening, infection, mal-occlusion, hypertrophic scar and aesthetic dissatisfaction were immediate and late post operative complications observed and documented.

Results: Road traffic accident (RTA) was the main etiologic factor (66.66%). Marginal mandibular nerve damage was noted in 20% cases treated with extra oral approach (group A). Post operative esthetic dissatisfaction was present in 60% patients (group A) as compared to 6.66% of the patients (group B). The rate of mouth opening compromise and mal-occlusion were also higher in the patients treated with extra oral approach compared with intra oral approach, although statistically not significant.

Conclusion: The intra oral approach for mandibular angle fracture management is an effective and comparatively better technique as compare to the extra oral approach.

Keywords: Extra oral approach, Malocclusion, Mandibular angle fractures, Surgical procedures.

INTRODUCTION

Maxillofacial trauma is a major cause of morbidity and mortality worldwide. It is a frequent occurrence in Pakistan and is associated with higher incidence of maxillofacial injuries involving fractures in different combinations. Mandibular fractures are one of the most common facial fractures[1]. Mandibular angle fractures occur in a triangular region located between anterior border of massater muscle and a line drawn obliquely downward from third molar to the postroinferior insertion of massater muscle. Most commonly these fractures are distal to mandibular third molar region[2]. Some of the most severe injuries are caused by road traffic accidents (RTA), but many others result from interpersonal violence, industrial accidents, contact sports and missiles or gunshot injuries. RTA has been reported as a leading cause of mandible fractures in many of the third world countries, while interpersonal violence is mainly responsible in the developed countries[1]. Change in pre trauma occlusion may be evident on clinical examination. Premature posterior dental contact and retrognathic occlusion may be resulted from bilateral mandibular angle fractures. Unilateral open bite deformity is associated with a unilateral angle fracture. Swelling on the affected side, pain, difficulty in chewing and mouth opening are few most common symptoms. Anesthesia, paraesthesia/ dysesthesia of the lower lip may be evident. An

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angle fracture may cause the lateral aspect of the face to appear flattened[2]. Different treatment modalities available for the mandibular fractures include maxillo-mandibular fixation (MMF) using various techniques, MMF with non rigid fixation using trans-osseous wiring at superior or inferior border, external pin fixation, Open reduction and internal fixation (ORIF) using mini plates and lag screws (semi rigid fixation), Non compression and compression plates (rigid fixation)[3]. Now a days, fixation with one or two mini- plates has become a widely acceptable method of providing internal fixation which can be carried out by two approaches i.e. Intra oral approach and Extra oral approach. For intra oral approach, buccal sulcus incision extending along the external oblique ridge is commonly used, while for extra oral approach sub-mandibular or retro mandibular incision is used. Mandibular angle fractures are prone to the highest complication rate of all fracture sites, ranging from 0% to 32%. The ideal treatment for these fractures remains controversial, and the reported complication rates, though many involve noncompliant populations, remain unacceptably high. The purpose of this study was to determine various post operative complications associated with two surgical procedures used for reduction and fixation of mandibular angle fractures.

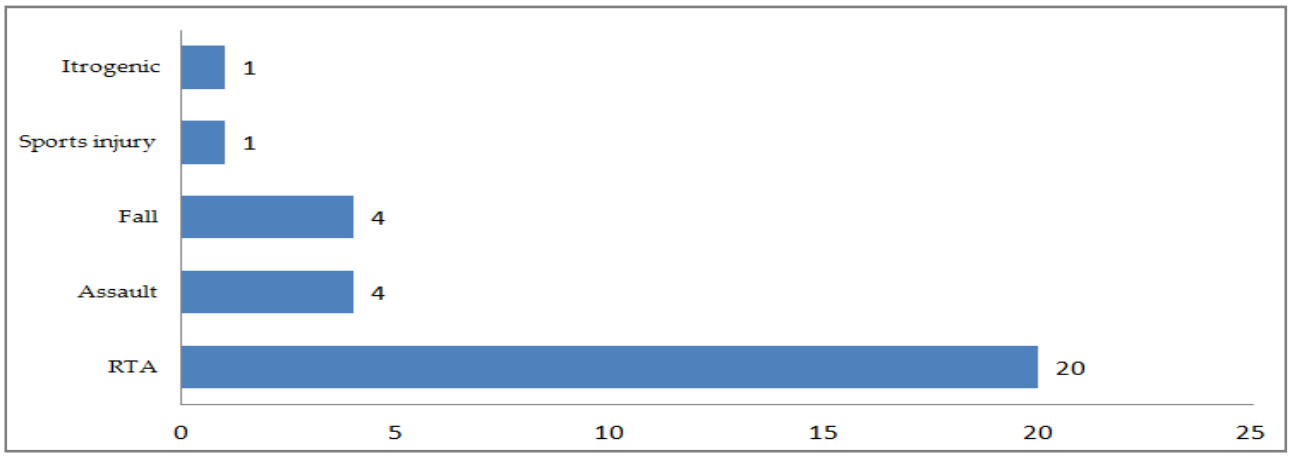

Figure: Distrubution of etiologic factors.

PATIENTS AND METHODS

This randomized control trial study involved the comparative outcome in terms of post treatment complications of isolated mandibular angle fracture patients treated at Liaquat University Hospital Hyderabad in 2011. Data was collected by a thorough review of patient's clinical records, radiographic and laboratory investigations. This clinical study which followed was carried out on 30 patients presenting with mandibular angle fracture at the department of oral and maxillofacial surgery, Liaquat University Hospital Hyderabad. Both male and female patients aged 20-40 years were included in the study which was carried out from May, 2011 to Nov, 2011 by non-probability consecutive sampling technique. The patients were divided into two groups (A and B) by using random number table. After randomization, any patients who were not found suitable for assigned treatment group were excluded from the study. Two standardized surgical techniques were used to treat these patients. Fifteen patients of group A were treated with extra oral approach and 15 patients of group B were treated with intra oral approach. Patients were selected by following inclusion and exclusion criteria. Inclusion Criteria: age between 20-40 years, medically fit to undergo surgery under general anesthesia, sufficient bilateral dentition to allow MMF and patients ready to participate in the study. Exclusion criteria: pathological fractures, condylar and sub-condylar fractures, edentulous patients, fractures of the middle third of face. A standard history and clinical examination chart

was completed for each patient included in the study to reach a conclusive diagnosis. Orthopantomogram (OPG) was the standard radiograph which was supplemented by posterior anterior (PA) view of face. Patients with history of trauma, swelling, pain and step deformity on palpation at the angle of mandible along with disturbed occlusion, showing bony discontinuity on radiograph were diagnosed as fracture. The experimental outcome of the surgical procedure was explained to every patient included in this study and informed written consent was taken before surgery. Procedure was performed under general anesthesia. Post operative antibiotics were administered to every patient and patients were followed up for four weeks. Postoperative radiographs were taken in follow-up for each patient, whenever required. During follow-up period any postoperative complication found, was recorded on the proforma under the following heading for the two treatment modalities of the mandibular angle fracture:

- Immediate postoperative complication (nerve damage).
- Late post operative complication (Infection, limited mouth opening, malocclusion, hypertrophic scar and esthetic dissatisfaction).

These have been explained with the help of tables. The collected data was entered and analyzed using SPSS version 16.0. Mean and standard deviation were calculated for quantitative variables. Categorical variables were presented by frequency and percentage. Independent sample t-test was applied for the comparison of age between groups. Fisher's exact test was applied for the comparison of Qualitative variables among groups. A *p*-value less than 0.05 considered as a significant value.

RESULTS

Total 30 patients were selected which were equally divided into two groups. There are 13 (86.7%) males and 2 (13.3%) females in group A with mean age of 31.5 ± 8.5. Eleven (73.3%) males and 4 (26.7%) females in group B with mean age of 30 ± 7.1. There is no significance difference regarding gender (p=0.65) and age (p=0.60) between groups. The results related to the etiology of the fracture have been categorized as (RTA), falls, assaults, sports injuries and iatrogenic. Figure shows the distribution of sample according to the etiology of fracture. Details about postoperative complications related to both types of treatment modalities are given in table. Post operative marginal mandibular nerve damage was not present in any of the patients treated with intraoral approach (group B). Compared to this, 20% of the patients treated had marginal mandibular nerve damage in extra oral approach (group A). Post operative esthetic dissatisfaction was present in only 6.66% of the patients (group B) as compared to 60% patients (group A).

Table: Complication rates in the entire treatment.

Postoperative Complications	Extra oral approach (Group A) n=15 (100%)		Intra oral approach (Group B) n=15 (100%)		*p*-value
	Present	Absent	Present	Absent	
Post operative Infection	3 (20.00%)	12 (80.00%)	2 (13.33%)	13 (86.66%)	0.99
Marginal Mandibular nerve damage	3 (20.00%)	12 (80.00%)	0 (0%)	15 (100%)	0.22
Malocclusion	3 (20.00%)	12 (80.00%)	1 (6.66%)	14 (93.33%)	0.60
Mouth opening Compromise	3 (20.00%)	12 (80.00%)	1 (6.66%)	14 (93.33%)	0.60
Esthetic Dissatisfaction	9 (60.00%)	6 (40.00%)	1 (6.66%)	14 (93.33%)	0.01
Scar	1 (6.66%)	14 (93.33%)	0 (0%)	15 (100%)	0.99

DISCUSSION

Mandibular angle fracture poses a unique challenge for maxillofacial surgeons because it is

the most common site of mandibular fractures[4] and secondly, they have the highest reported rate of post operative complication rate of any mandibular area[5]. RTA was the most common cause of fracture, as is the case in most of the studies[6-9]. Post operative complication rate in terms of nerve damage was 20% in extra oral group. This finding is similar to the study conducted by Ali S[10]. Another study showed very less nerve damage (5.56%) while using extra oral approach[11]. Intra oral approach showed no case of nerve damage in our study and this is in accordance with the other studies[10,11]. Another study showed overall parasthesia in 26.7% cases[12]. A study conducted by Yazdani et al showed very high rate of lip numbness (55.6%) in patients treated intra orally[13]. The results demonstrated that infection occurred in 13.3% of the patients treated through intra oral approach whereas it was 20% with extra-oral approach. Infection rate is slightly higher as compared to the studies by Ali et al and Rehman et al in both groups. But these results are comparable with another study in which infection rate was 20% on average[12]. Malocclusion was assessed in this study subjectively through patient's complaints which was observed in 6.66% of the cases operated by intra-oral approach and 20 %in the cases operated by extra-oral approach. It was slightly higher in study conducted by Pattar et al (36.7%)[12]. On the other hand, another study showed very less post operative malocclusion (2%)[14]. Hypertrophic scars were seen in 6.66% of the patients in extra oral approach which is slightly higher than study which reported 2.56% hypertrophic scar through extra oral approach[15]. The possible limitation of this study is the sample size.

CONCLUSION

Based on the results of this stuyd, it can safely be said that there is no statisticlly significance difference between two groups regarding the outcomes. Although there are some advantages of intra oral approach like avoidance of extra oral scar and nerve injury, both the approaches are equally effective in managing the mandibular angle fractures.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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