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COMPARISON BETWEEN INTRA-ORAL VERSUS TRANS-BUCCAL APPROACH FOR TREATMENT OF MANDIBULAR ANGLE FRACTURES.

Naeem Mustafa[1], Suneel Kumar Punjabi[2], Salman Shams[3], Priya[4]

1. BDS, MSc
Postgraduate Resident
Department of Oral & Maxillofacial Surgery
Faculty of Dentistry LUMHS, Jamshoro.
2. BDS, FCPS
Associate Professor
Department of Oral & Maxillofacial Surgery
Faculty of Dentistry LUMHS, Jamshoro.
3. BDS, MSc
Senior Lecturer
Department of Oral & Maxillofacial Surgery
Faculty of Dentistry LUMHS, Jamshoro.
4. BDS
Postgraduate Resident
Department of Community Dentistry
Faculty of Dentistry, LUMHS, Jamshoro.

Correspondence Address:
Dr. Suneel Kumar Punjabi
Flat No: 307 3rdfloor Citizen Plaza
Opp Aga Khan Hospital Main
Jamshoro Road,
Qasimabad, Hyderabad.
drsunilpanjabi@yahoo.com

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ABSTRACT… Objectives: The aim of this study was to compare the outcomes like infection and swelling by using two different techniques (intra-oral versus trans-buccal) to treat the fracture of the angle of mandible. **Study Design:** Comparative Cross-sectional study. **Setting:** Department of Oral & Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. **Period:** 1st Feb 2017 to 30th Dec 2017. **Material and Methods:** All the patients age ranges from 18years to 45years, patient having isolated mandibular angle fracture either gender was included in the study Patients were divided into two groups by lottery method in group A (Intra-oral approach) and group B (Trans-buccal approach). Orthopantomography (OPG) and Posterior-Anterior (PA) view of face were the two radiographs taken to confirm diagnosis. **Results:** Mostly young patients were found in both groups with mandibular angle fracture as 54.3% patients of group A and 43.5% patients of group B with age group of 18- 30 years. Male gender was most common 95.7%. On 1st postoperative week infection was found only in one cases of group B, while no any cases were found with pain in group. **Conclusion:** The results of this study concluded that both techniques are the reliable and showed good outcome particularly as; infection rate was significantly decreased in intra oral approach as compare to trans-buccal approach.

Key words: Intra-oral, Mandibular Angle Fracture, Tans-Buccal Approach, Trocar.

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INTRODUCTION

Mandibular Fractures occurs about two third of all maxillofacial injuries, among which mandibular angle fracture represent for 26-35%.[1] The fracture angle of mandible is the 2nd utmost common site of fracture and associated with high rate of complications.[2] The main reason of the fracture of mandibular angle are thinner cross-sectional area, the anatomical change from horizontal to vertical rami and presence of third molar and muscle force present in that region.[2,3] Most common cause of mandibular fracture occurs as a result of road traffic accident, followed by assault, and interpersonal violence.[3] Poor law and order situation and lack of legislation in the region resulting in rash behavior while driving, particularly motorcycles is another reason of fractures in young population. Certain other studies conducted at national and regional levels have the same observations. Fractures of the mandibular angle are common and comprise 31% of all mandibular fractures.[4] Current studies show that the danger of mandibular angle fracture is increased if impacted lower 3rd molars are present.[4] Alternative and important factor which makes mandibular angle more prone to fracture is the unforeseen change in shape from horizontal to vertical rami.[5]

Mandibular angle fractures are treated by variety of techniques with different incisions like intra-oral and trans-buccal approach.[5] Open reduction and internal fixation with the plate and screw fixation is the method of choice for the treatment of mandibular angle fracture.[5,6] However the mandibular angle fracture biomechanics of the angle make treatment difficult.[7,8]

With intra-oral technique involves operating entirely through an incision which will be given

through the buccal mucosa and gingival, trans-buccal approach involve an intra-oral incision and trivial incision on skin of face, that allow the usage of trans-buccal trocar to permit instrument such as drill or screw driver to passed over it.[9] Trans-buccal approach is least overwhelming superior and less time consuming than others approach, nonetheless it necessitate expert operating surgeon, skill assistant and special instruments. Complications associated with mandibular angle fracture are infection, malunion, malocclusion, and facial nerve damage.[10] intra-oral approach gives no exterior scar, and marginal mandibular nerve damage can be sidestepped.[11] Extra-oral approach provides better access and less infection rate.[12,13] Different studies showed different favorable finding regarding different management techniques for the treatment. The aim of this study was to evaluate the comparative outcomes like infection and swelling by using two different techniques (intra-oral versus trans-buccal) for the management of mandibular angle fracture.

MATERIAL AND METHODS

A Comparative Cross-sectional study was done at the Department of Oral & Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. From 1st Feb 2017 to 30th Dec 2017, approval of ethical review committee from University board was taken, total 92 patients (46 in each group) Group A: Intra-oral approach, Group B: Trans-buccal approach age range from 18-45 years of both genders with isolated fractures of angle of the mandible were included in study while Patients not willing to participate in study, Patient having bilateral mandibular angle fracture, mentally retarded patients, Patients with any co-morbid and Patient with other associated fractures were excluded from the study. Patients with isolated mandibular angle fractures confirmed by clinically and radiographically at Orthopantomography (OPG) and Posterior-Anterior (PA) who need open reduction and internal fixation was enrolled. An informed and written consent was taken before enrolment of study. A complete history of the patient with name, age, gender, presenting complaint, and clinical findings was recorded. Complete preoperative assessment of patient and diagnosis of fracture were recorded.

Procedure

The standard surgical protocols were followed. Surgery was done under general anesthesia. Nasotracheal intubation were also performed.

Group A

Following local infiltration Xylocaine with 2% adrenaline 1:100,000 (Medicine cartridges Company, Made in Korea) an incision was strategized to the occlusal plane of maxilla from the anterior border of ascending ramus at. The incision was ended at first molar of mandible approximately 5mm form the junction of the attached mucosa and vestibule along the anterior ramus. The fractured area was uncovered by raising mucoperiosteal flap. The fracture segments were fixed through direct visualization. Acceptable occlusion was attained and stabilized by intermaxillary fixation. Stabilization of Fractured parts was done by using 2.0mm titanium miniplate (Moin International Pakistan) and secured with monocortical screws of 6-8mm in length. The intermaxillary fixation was then unconstrained and occlusion was re-observed. Profuse irrigation preformed with Normal saline 0.9% (Searle Ltd. Pakistan). Incision was closed with vicryl 3-0, (Johnson & Johnson Company, Made in USA) suture. Standard antibiotics and analgesics were given postoperatively.

Group B

A stab incision is given extra orally in addition to the intraoral incision to insert the trans-buccal cannula. stab incision extra orally was given along the fracture line and the position of the facial vessels. The trocar was progressed at the surgical area with dull segmentation by stab incision, puncturing the periosteum site planned fixing the plate. The trocar assembly was stabilized using cheek retractor throughout movement towards and away from the fracture line. A drill that was 11.5cm long and 1.5mm in diameter was used by drill guide to drill the holes. The fracture reduction procedure was same as that of the intraoral method excluding that the trocar assembly was detached and the suturing

was done over extra-oral incision by using 5.0 proylene (Johnson & Johnson company, Made in USA) suture. Standard antibiotics and analgesics were given postoperatively. After treatment patients were shifted in the ward for two days for any immediate postoperative complications (Bleeding, Fever, Pain and Swelling). Patients were discharged after two days. Follow up for each patient after one week, third and sixth weeks to assess swelling and infection. All the data was entered in the proforma.

Data collection was done using the SPSS version 20.0 was used to analyze the data using descriptive statistics.Chi-square test was applied to compare the qualitative variables in both groups and T- test was applied to compare the quantitative variables in both groups like as swelling. Qualitative variables were expressed as absolute frequencies and percentages.
p value <0.05 was considered as significant.

RESULTS

Mostly young patients were found in this in both groups with mandibular angle fracture as 54.3% patients of group A and 43.5% patients of group B were with age group of 18- 30 years. Followed by 37.0% cases of Group A and 47.8% patients of group B were with age group of 31-40 years, while very few patients were more than 40 years of the age as 8.7% patients of group A and 8.75% patients of group B were with age group of 41-45 years. Figure-1

Gender distribution in both groups is presented in Table-I.

Post-operative complication of infection is described in Figure-2.

Post-operative complication of swelling of tragus to corner of mouth is described in Table-II.

Swelling from tragus to menton on 1st week follow up swelling was elevated in group A 155.3±4.3mm as compare to group B 150.7±5.8mm but no significant p-value 0.09. details are presented in Table-III.

On 1st week follow up swelling from canthus to mandible angle was raised in group A 128.4±3.9mm as compare to group B 124.4±3.3mm but no significant p-value 0.08. details are presented in Table-IV.

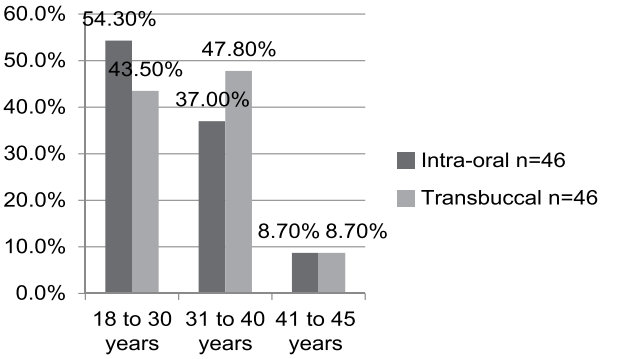

Figure-1. Patients distribution according to age (n=92)

Gender	Study Groups	
	Intra-oral (n=46)	Trans-buccal (n=46)
Male	44(95.7%)	43(93.5%)
Female	05(4.3%)	03(06.5%)
Total	46(100%)	46(100%)

Table-I. Patients distribution according to gender (n=92)

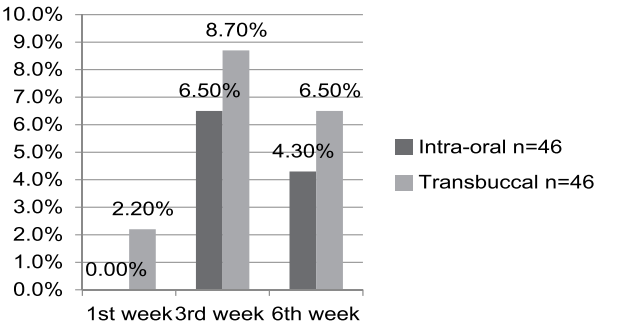

Figure-2. Patients distribution according to Infection (n=92)

Swelling from Tragus to Corner of Mouth	Study Groups		
	Intra-oral (n=46)	Transbuccal (n=46)	P-Value
1st week	131.5±4.5mm	125.4±2.5mm	0.01
3rd week	127.7±4.7mm	124.6±4.4mm	0.02
6th week	122.6±5.3mm	115.9±5.6mm	0.06

Table-II. Patients distribution according to swelling from tragus to corner of mouth (n=92)

Swelling From Canthus to Mandible Angle	Study Groups		
	Intra-oral (n=46)	Transbuccal (n=46)	P-Value
1st week	128.4±3.9mm	124.4±3.3mm	0.08
3rd week	124.7±2.7mm	115.6±3.5mm	0.01
6th week	112.6±3.1mm	111.9±4.5mm	0.07

Table-III. Patients distribution according to swelling from lateral canthus to mandible angle (n=92)

Swelling from Tragus to Menton	Study Groups		
	Intra-oral (n=46)	Trans-buccal (n=46)	P-Value
1st week	155.3±4.3mm	150.7±5.8mm	0.09
3rd week	150.2±3.5mm	143.5±2.4mm	0.04
6th week	143. ±4.7mm	139.5±3.4mm	0.08

Table-IV. Patients distribution according to swelling from tragus to menton (n=92)

DISCUSSION

The angle of mandible is a common site of fracture with high rate of problems. A functionally firm reduction is essential to lessen the problems. Diverse approaches of internal fixation have been encouraged with erraticaccomplishments.[14] In this study two techniques were compared in the term of infection and swelling (intra-oral versus trans-buccal) for the management of mandibular angle fracture. Mostly young patients were found in this both groups with mandibular angle fracture as 54.3% patients of group A and 43.5% patients of group B were with age group of 18- 30 years. Followed by 37% cases of Group A and 47.8% patients of group B were with age group of 31-40 years, while very few patients were more than 40 years of the age as 8.7% patients of group A and 8.75 patients of group B were with age group of 41-45 years. In the favor of this study, Asish Kumar Das et al[14] also found age of the patients were within the range of 15 to 60 years, furthermore incidence of mandibular angle fracture was comparatively higher in between the age of 21years to 30 years with a mean value of 29.75 years. RTA was the commonest factor behind angle fracture of mandible. In the contrast of this study Asish Kumar Das et al[14] stated that fractures occurred from road traffic accident in 09(45%), fall in 03(15%), assault in 07(35%) and others in 01(5%) patients. In the present study male gender was most common as compare to females in both groups as; 95.7% were male in group A and 93.5% male in group B, while only 4.35% female were in group A and 6.5% were in group B. on other hand Bayatet al, found comparable results with (M: F = 9:1). Danda A K et al[15] also found similar findings regarding gender. This may because most common cause behind mandibular angle fracture and in male is mostly involved in outdoor activities. In this study infection rate was found most common in trans-buccal group B as compare to intra-oral group A. Usage of an intra-oral method became more popular as it does not cause external scar, and damage to marginal mandibular nerve was sidestepped. In the study of Beza SA, et al[16] reported that in the trans-buccal group, the incidence of infection was 8.1%. In another study of Intra-oral approach in the management of mandibular angle fracture is more desirable in terms of cost especially if intra-osseous wire is used instead of mini-plates. Other advantages are less operative time, fewer chances of infections and nerve damage as compared to extra-oral approach.

On other hand in the present study swelling was significantly decreased in trans-buccal group during 6 weeks follow-up p-value 0.01. Similarly, Beza SA, et al[16] reported that the outcome of this study advocates that extra-oral method has greater complications than trans-buccal approach when used to treat the fracture of angle of mandible. On other hand Sugar *et al*[17] compared outcomes following fixation of 140 simple non-comminuted mandibular angle fractures with a combined trans-buccal and intraoral technique There was a increased prevalence of wound dehiscence in the intra-oral group (16%) than in the trans-buccal group (12%) at the first visit. This had increased to 25% in the intra-oral group and 15% in the trans-buccal group at the second visit. At the third visit, 21% of the intra-oral group had wound dehiscence and/or granulation tissue as did 9% of the trans-buccal group (p =0.05).

Swelling was assessed from tragus to corner of mouth in group A was significantly increased 131.5±4.5mm as compared to group B 125.4±2.5mm but was decreased in both groups

on 6th week; 122.6±5.3mm in group A and 115.9±5.6mm in group B.

Swelling from tragus to menton on 1st week follow up was elevated in group A 155.3±4.3mm as compared to group B 150.7±5.8mm, whereas on 6th week, swelling decreased in both the groups as 143.5±4.7mm in group A and 139.5±3.4mm in group B.

Swelling from lateral canthus to angle of mandible was raised in group A 128.4±3.9mm as compared to group B 124.4±3.3mm. on 6th week, swelling was noticeable decreased in both the groups; 112.6±3.1mm in group A and 111.9±4.4mm in group B.

On 1st postoperative week infection was found only in one cases of group B, while no any cases were found with pain in group A. On 3rd week of follow up majority of cases 8.7% were found with infection in group B as compare to group A 6.5% p-value 0.01. On 6th week of follow up infection was found 4.3% in group A which was significantly decreased as compare to group B as 6.5%, p-value 0.03. More research should be conducted on this event regarding management techniques.

CONCLUSION

The results of this study concluded that both techniques are the reliable and showed good outcome particularly as; infection rate was significantly decreased in intra oral approach as compare to trans-buccal approach and swelling was significantly decreased in trans buccal approach as compare to intra oral approach.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Naeem Mustafa	Intro, Duscussion writing, Methodology, Results.	
2	Suneel Kumar Punjabi	Concept & cases done.	
3	Salman Shams	Editing & References.	
4	Priya	Literature searching.	