



TREATMENT OF MANDIBULAR CONDYLE FRACTURE - A COMPARISON OF TWO PROTOCOLS.

Zunair Memon¹, Samreen Naz², Abdul Ghani Shaikh³, Zahid Hussain Siyal⁴, Salman Shams⁵

1. BDS, MSc (OMFS)
Phd Scholar Oral Pathology
Institute of Dentistry, LUMHS,
Jamshoro.
2. BDS, MSc OMFS
Assistant Professor Oral &
Maxillofacial Surgery
Bhittai Dental & Medical College.
3. BDS, MSc
Assistant Professor
Science of Dental Materials
Department
Institute of Dentistry, LUMHS,
Jamshoro.
4. BDS, MSc
Ph.D Scholar Oral Pathology
Institute of Dentistry, LUMHS,
Jamshoro.
5. BDS, MSc (OMFS)
Lecturer Oral & Maxillofacial Surgery
LUMHS.

Correspondence Address:
Dr. Salman Shams
Oral & Maxillofacial Surgery
LUMHS.
salman_omfs@hotmail.com

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ABSTRACT... Objectives: To compare the outcome of two protocols (open reduction and closed reduction) in the treatment of mandibular condyle fracture. **Study Design:** Comparative study. **Setting:** Department of Oral & Maxillofacial Surgery, Institute of Dentistry, Liaquat University of Medical and Health Sciences Jamshoro. **Period:** January 2016 to September 2016. **Material & Methods:** After selection of patient into either group, for closed reduction technique, maxillomandibular fixation was applied for 4-6 weeks. For open reduction, a preauricular incision was given and fracture was reduced and fixed with miniplates after achieving the normal occlusion. Post operatively, patients of both the group were recalled after one, two and three months for the assessment of the functional effects such as occlusion and range of motion in both groups. **Results:** Mean age of the patients was 29.80+4.42 years in group 1 (open reduction group), while mean age of the group 2 (closed reduction group) was 23.95+6.63 years. Male were in the majority in both groups 17 in group 1 and 16 in group 2. Out of 20 patients in group 1, 11 patients had condylar neck fracture and 9 had subcondyle fracture. While in group 2, 13 patients had subcondyle fracture and 7 had condylar neck fracture. In both groups again no significant difference was found according to location of the fracture (p-value 0.20). Group 1 (open reduction) had better functional results in terms of occlusion and range of motion after 3 months as compared to the group 2 (closed reduction). P-value 0.19. **Conclusion:** In dealing with mandibular condyle fractures it was concluded that open reduction and internal fixation is a better technique as compared to the closed reduction with maxillomandibular fixation.

Key words: Closed Reduction, Mandibular Condyle Fracture, Open Reduction.

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INTRODUCTION

The bone which has the compound role in esthetics of the face and efficient occlusion is solely the mandible. Mandibular fractures are the most common fractures of the facial skeleton as they have the famous position in lower jaw, and it accounts for 36% to 59% of all maxillofacial fractures.^{1,2} The mandibular fracture varies according to centers and countries, with the condyle, angle and symphysis as the most frequently encountered fracture site.³

Condyle fracture occurs most frequently and in dentate and edentulous patients it accounts for about 30% and 37% of mandible fractures respectively.⁴ Pain, limited mandibular movement, muscle spasm, deviation of the mandible,

malocclusion, pathological changes in the temporomandibular joint, facial unevenness and ankylosis are the mostly encountered problems with fractures of mandibular condyle.⁵ Mandibular condyle fracture can be classified as unilateral or bilateral; according to the fracture position (condyle head, condyle neck and subcondyle) and according to the degree of fracture displaced (non-displaced, deviated, displaced and dislocated).⁴

The common etiological factors of mandibular condyle fractures are road traffic accidents, falls, firearm injuries, interpersonal violence, sports injuries and industrial accidents.⁶

The treatment options of unilateral condyle

fractures are open reduction and internal fixation or closed reduction with maxillomandibular fixation; however, for either closed or open technique, the success of the treatment relies on the restoration of normal dental occlusion and bony union.⁷ Both methods of management have their own advantages and disadvantages. Closed reduction does not upset the vascular envelope, less costly for the patient, no jeopardy to facial nerve and can be managed under local anesthesia; but it carries a drawback of having mouth closed and an extensive period of immobilization. It also requires the dentition being intact, uneasy for the patients and in terms of oral hygiene maintenance it grossly requires patient's fulfillment. Advantages achievable with open reduction are: direct visualization and reduction of fractured bone segments and restoration of the patient's pre injury occlusion without maxillomandibular fixation; this permit for bony healing in a shorter phase of time (primary bone healing), enhanced nutrition and oral hygiene; however, possible foreign body infections are more expected with this method and it carries a momentous danger of facial nerve traction injury.⁸

The recommended treatment of bilateral mandibular condyle fracture is open reduction and internal fixation of at least one condyle followed by maxillomandibular fixation for certain period of time. There are two thoughts of management of unilateral condyle fracture that makes it still controversial, as some favors close reduction with MMF and other group prefers open reduction with internal fixation.^{9,10}

The aim of this study was to compare the outcome of unilateral mandibular condyle fracture treated by open reduction and internal fixation with closed reduction with maxillomandibular fixation.

MATERIAL & METHODS

This comparative analytical study with non probability purposive technique was conducted at department of oral and maxillofacial surgery Hyderabad/Jamshoro.

Total Sample size was divided in to two groups

Group A (Open Reduction) = 20 Patients

Group B (Closed Reduction) = 20 Patients

INCLUSION CRITERIA

- Patient having unilateral non comminuted low condylar fracture.
- Patient in age group 15-50.
- Patient with either gender.
- Patient with sufficient bilateral dentition to allow Maxillomandibular Fixation.

EXCLUSION CRITERIA

- Patient with bilateral condyle fracture.
- Patient with undisplaced condyle with normal occlusion.
- Patient not medically fit to undergo surgical intervention.
- Patient not willing to participate in this study.

DATA COLLECTION TECHNIQUE

Patients meeting the inclusion criteria coming through Out Patient Department (OPD) and through emergency department were included in this study. Personal details of patient including name, age, gender, hospital registration number were recorded on Proforma. Diagnosis of mandibular condyle fracture was done on the basis of clinical examination, Orthopantomography (OPG) and P.A view of face. Random allocation was done by lottery method: odd number were treated with open reduction with internal fixation and even number were treated with closed reduction with maxillomandibular fixation.

For open reduction and internal fixation the patient was prepared for general anesthesia and the surgical area was cleaned with antiseptic before starting surgery. The fracture area was reduced with the instrument manually and fixed with miniplates (5 holes titanium miniplates with 4 screws having the size of 6mm, Moin International, Made in Pakistan). The patient was discharged from the hospital and requested for follow-up after one, two and three months for the assessment of the functional effects such as occlusion and range of motion.

For closed reduction with maxillomandibular fixation once arch bar was secured, cross intermaxillary wires were used to obtain pre-injury occlusion and fixation. The patient mouth was closed and advised to take only soft and liquid

diet for next 4-6 weeks. The standard antibiotics with analgesic in syrup were prescribed for 5 days. Oral hygiene instructions were given and mouthwash was prescribed to maintain good oral hygiene. The patient was discharged from the hospital and requested for follow-up after one, two and three months for the assessment of the functional effects such as occlusion and range of motion.

RESULTS

Mean age of the patients was 29.80+4.42 years in group 1 (open reduction group), while mean age of the group 2 (closed reduction group) was 23.95+6.63 years (Table-I). Male were in the majority in both groups 17 in group 1 and 16 in group 2 (Table-II). Out of 20 patients in group 1, 11 patients had condylar neck fracture and 9 had subcondyle fracture, while in group 2, 13 patients had subcondyle fracture and 7 had condylar neck fracture (Table-III). In both groups again no significant difference was found according to location of the fracture (p-value 0.20). Group 1 (open reduction) had better functional results in terms of occlusion and range of motion after 3 months as compared to the group 2 (closed reduction) P-value 0.19. (Table-IV to VI)

Age	Mean+ STD.	P-Value
Group-1	29.80+4.42	0.002
Group-2	23.95+6.63	

Table-I. Distribution of cases according to age N=20

Gender	Group		P-Value
	Open Reduction	Closed Reduction	
Male	17	16	0.144
Female	03	04	

Table-II. Distribution of cases according to gender

Condyle	Group		P-Value
	Open Reduction	Closed Reduction	
Sub condyle	9	13	0.20
Condylar neck	11	7	

Table-III. Distribution of cases according to location of fracture

1 Month	Group		P-Value
	Open Reduction	Closed Reduction	
Occlusion			0.04
Good	16	13	
Poor	04	07	
Range of motion			0.05
Good	10	06	
Poor	10	14	

Table-IV. Distribution of cases according to 1 month occlusion and range of motion

2 Month	Group		P-Value
	Open Reduction	Closed Reduction	
Occlusion			0.07
Good	18	14	
Poor	02	06	
Range of motion			0.06
Good	15	09	
Poor	05	11	

Table-V. Distribution of cases according to 2 month occlusion and range of motion n=20

3 Month	Group		P-Value
	Open Reduction	Closed Reduction	
Occlusion			0.19
Good	19	16	
Poor	00	02	
Total	19	18	
Range of motion			0.09
Good	18	14	
Poor	01	04	

Table-VI. Distribution of cases according to 3 month occlusion and range of motion

DISCUSSION

In this study mean age of the patients was 29.80+4.42 years in open reduction group, while mean age of the closed reduction group was 23.95+6.63 years. Comparable findings were found by Badar MA et al.¹³ In his study of 70 patients, 80% were males. The age ranged from 5 to 47 years. Majority of patients were in age group 21-30 years (40%) followed by 11-20 years (25.7%). As well as in this study male were in the majority in both groups 17 in group 1 and 16 in group 2 out of 20 from each group,

while 3 females were in group 1 and 4 in group 2. Another study carried out by Rasheed A et al¹⁴ which included sixty dentate patients having condylar and associated mandibular fractures. The sample included 38 (63.3%) males and 22 (36.6%) females. Majority of the patients are male because fractures were mostly associated with road traffic accident and fall from height, and since males are more involved in outdoor activities they are more exposed to these risk factors as compared to females. On other hand Rampaso CL et al¹⁵ found males representing 72.0% of the sample, the age group most affected being the one between 21 and 30 years.

In our study right side was more often involved than the left side in both groups, without significant difference 0.50. In group 1 out of 20 patients, 12 had right side fracture and 8 had left side fracture. While in group 2, 14 patients were with right side fracture and 6 had left side fracture out of 20 cases. Rasheed A et al¹⁴ also found majority of cases with right side 32 and 28 had involved left side.

In our series, out of 20 patients in group 1, 11 patients had condylar neck fracture and 9 had sub condyle fracture. While in group 2, 13 patients had subcondyle fracture and 7 had condylar neck fracture. In both groups no significant difference was found according to type of fracture p-value 0.20. Akinbami BO et al¹⁶ reported that (72.7%) of the patients with condyle fracture had associated fractures affecting other sites of the mandible while 3 (27.3%) patients had isolated condyle fractures, the lower neck of the condyle was the site most commonly involved with 9 (64.3%) cases while the subcondyle was affected in 3 (21.5%) cases respectively.

In our series according to the assessment of function after 1 month post-surgery, patients who underwent open reduction had good occlusion and good range of motion as compared to the closed group. P-value 0.05. Authors now have come to the conclusion that if the technique is minimally invasive than open reduction is also possible in paediatric patients in managing condylar fractures.¹⁷ Factors that have gained

priority in managing these fractures by open reduction is mainly the development, while surgeons with confidence and great expertise in dealing with internal rigid fixation are also important.¹⁸

Various studies reported that cases where condyle is displaced into middle cranial fossa, inappropriate occlusal restoration by closed reduction and lateral extracapsular displacement are the absolute indications where open reduction and internal fixation has to be carried out.¹⁹⁻²²

In our study functional assessment in terms of occlusion and range of motion after 2 and 3 month, group 1 (patients who underwent open reduction and internal fixation) had good occlusion and good range of motion as compared to the group 2 (closed reduction with maxillomandibular fixation) but no significant difference was found. P-value 0.06. In the study of the Santleret al²³ two hundred thirty-four patients with fractures of the mandibular condylar process were treated by open or closed methods. On the basis of radiological, objective and clinical examination 150 patients with a mean follow-up time of 2.5 years were analyzed. While comparing surgical and non surgical treated cases no noteworthy dissimilarity in mobility, joint troubles, occlusion, muscle pain or nerve disorders were observed. Marker et al²⁴ in his study informed that treating fractures of condyle by closed reduction is non distressing, secure and dependable and rarely cause instability of function and malocclusion.

CONCLUSION

It was concluded that open reduction and internal fixation is better technique as compared to the closed reduction with maxillomandibular fixation in the treatment of mandibular condyle fracture. Open reduction and internal fixation showed good occlusion and range of motion till 2 months follow-up, while after three month follow-up outcome was non-significant in both groups. More randomized research is needed for further confirmation and accurate results as the sample size was small for definite conclusions to be drawn.

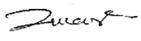
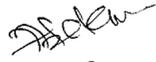
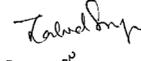
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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Zunair Memon	Principal author, Data collection.	
2	Samreen Naz	Discussion.	
3	Abdul Ghani Shaikh	Manuscript designing.	
4	Zahid Hussain Siyal	References.	
5	Salman Shams	Resultls & Proof read.	