

# Restoration of Ramus Height after Open and Closed Reduction of Mandibular Condyle Fractures

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## ABSTRACT

**Aim:** To examine the restoration of ramus length of mandibular condyle fractures after open and closed reduction of condyle fractures.

**Study Design:** Comparative/Observational study.

**Place & Duration:** This study was conducted at Oral and Maxillofacial Department, Sandeman Provincial Hospital Quetta from 1<sup>st</sup> January 2018 to 30<sup>th</sup> June 2018.

**Methods:** In this study, 20 persons suffering with condyle fractures of both genders were integrated. Patient's ages were 10 to 50 years. Patient's detailed medical history including age, sex and residency was examined after taking informed consent from all the patients and etiology of fractures were examined. All the patients had undergone treatment of condyle fractures with ORIF and MMF methods. Ramus height observation was examined after treatment and compared the results between both methods.

**Results:** Out of 20 patients, 16 (80%) patients were males and rest 20% were females. 13(65%) patients were ages between 10 to 30 years while 7(35%) patients had ages 31 to 50 years. 15(75%) patients had urban residency. 6(30%) were bilateral fractures while 14 (70%) were unilateral. 8(40%) condyle were on left side and 6 (30%) were on right side. 15 patients were treated with Maxillomandibular fixation and 5 patients were treated with Open reduction and internal fixation method. There is no significant difference was observed associated with outcomes in open reduction and closed reduction method.

**Conclusion:** Retromandibular fixation method was easy and safe for the internal fixation of the condylar fractures and has better outcomes. We observed no major difference between open and closed method for treatment of condylar fracture.

**Keywords:** Open reduction procedure, Closed Reduction, Mandibular condyle fracture

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## INTRODUCTION

The more usually fracture of mandible is the condylar locality, its range is from 25% to 35% in whole mandible breakage<sup>1,2</sup> and condylar fractures mechanism can be classified as intracapsular, which is relating with condylar head, extracapsular, which is relating with condylar neck, or subcondylar, which is relating with low condyle also it have dependency on height of breakage. The direction of displacement can also be used for its classification as medial<sup>3</sup>, because of the dragging of the lateral pterygoid muscle the distal fragments of condylar procedure breakage are lying down to be dislocated towards the side of medial. In this situation, better medication results are very tough with conventional medication because of the continuous dragging of the lateral pterygoid.

Zide and Kent<sup>4</sup> accounted that when the middle cranial fossa is displaced from the condylar head showed complete evidence for open reduction<sup>5</sup>, and current experiments concluded that open reduction and internal fixation given practical results higher to those obtained with conventional healing in the executive of condylar process fractures<sup>1,6</sup>. The retromandibular access gives straightforward admission towards the condylar process and a larger field for direct fracture administration<sup>6,7</sup>. On the other hand, assuming that the distal condylar segment is

dislocated towards the inner side to the middle cranial fossa, it is latent beside the proximal segment and the afterward work aspect is than limited. The doctor can examine no more than the limited or proximal fractional surface of distal condylar fragments in the course of the ancient mandibular access. Thus the medially dislocated condylar fragment is quite tough to rearrange, and to retrieve transversely twisted fracture division, big skin laceration and extra destructive withdrawal of the malleable tissue can be mandatory. Further dealings are required to readjust the distal condyle fragment for unwavering fixation to beat these disturbances.

## MATERIALS AND METHODS

This comparative/observational study was conducted at Oral and Maxillofacial Department, Sandeman Provincial Hospital Quetta from 1<sup>st</sup> January 2018 to 30<sup>th</sup> June 2018. In this study, 20 persons suffering with condyle breakages of both genders were integrated. Patient's ages were 5 to 50 years. Patient's detailed medical history including age, sex and residency was examined and etiology of fractures were examined. Patients had multiple displaced maxillofacial fractures, those who were not interested for surgical treatment and those patients whom were not fit for treatment were excluded from this study.

All the patients had undergone treatment of condyle fractures with ORIF and MMF methods. Patients with good occlusion condition were treated with Maxillomandibular Fixation method. Wires were removed after 20 days and were replaced by elastic band (1/8). Complete follow-up was taken on 3 and 65 months after surgical treatment.

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Ramus height observation was examined after treatment and compared the results between both methods. All the data was analyzed by computer software 21. P-value <0.05 was considered as significant.

## RESULTS

There were 16 (80%) patients males and rest 20% females. Thirteen (65%) patients were ages between 5 to 25 years while 7 (35%) patients had ages 26 to 50 years. 15 (75%) patients had urban residency. 6 (30%) were bilateral fractures while 14 (70%) were unilateral. 8 (40%) condyle were on left side and 6 (30%) were on right side. 15 patients were treated with Maxillomandibular fixation and 5 patients were treated with Open reduction and internal fixation method (Tables 1-2).

Road traffic accidents was the most frequent cause of condylar fracture and reported 13 (65%), Fall from height reported 5(25%) and 2(10%) as inter-personal violence (Table 3).

We found 32 fractures in 20 patients. The site of condyle fracture was noted as Diacapitular, Head and neck as 65%, 25% and 10% respectively. 13 cases had found unerupted lower third molar and 7 cases had found erupted lower third molar [Tables 4-5].

Average preoperative ramus elevation distinction involving two of sides of the mandible in the unilateral condyle fracture increase was notes as 5.25±5.15mm in maxillomandibular fixation and 5.15±5.10mm in open reduction internal fixation. Mean immediate post-operative ramus height was 3.22±4.45mm in MMF and -0.71±4.32. After 6 months mean post-operative ramus height was 1.44±4.5mm in MMF and -0.52±3.27mm in Open reduction (Table 6). There is no significant difference was observed associated with outcomes in open reduction and closed reduction method.

Table 1: Demographic information of patients

Variable	No.	%
<b>Gender</b>		
Male	16	80.0
Females	5	20.0
<b>Age (years)</b>		
5 – 25	13	65.0
26 – 50	7	35.0
<b>Residency</b>		
Urban	15	75.0
Rural	5	25.0

Table 2: Distribution of condyle fractures (n=20)

Characteristics	Unilateral	Bilateral
Condyle Fractures	14 (70%)	6 (30%)
Left	8	-
Right	6	-

Table 3: Factors associated to fractures

Characteristics	No.	%
Traffic accidents	16	80
Fall from height	3	15
Personal violence	1	5

Table 4: Sides of condylar fractures in both methods

Characteristics	Maxillomandibular (n=15)	Open Reduction (n=5)
Diacapitular	10 (66.67%)	3 (60%)
Head	4 (26.67%)	1 (20%)
Neck	1 (6.66%)	1 (20%)

Table 5: Angle fractures relation with unerupted lower third molar

Characteristics	Unerupted (n=13)	Erupted (n=7)
Angle	2 (15.38%)	1 (14.29%)
Anterior Mandible	7 (53.85%)	3 (42.86%)
Body	1 (7.69%)	1 (14.29%)
Isolated	3 (23.08%)	2 (28.57%)

Table 6: Ramus height difference in both methods

Characteristics	Maxillofixation (n=10)	Open reduction (n=4)	P value
Mean preoperative ramus height difference (mm)	5.25±5.15	5.15±5.10	0.86
Mean Immediate post-operative ramus height (mm)	3.22±4.45	0.71±4.32	0.04
After 6 months mean post-operative ramus height (mm)	1.44±4.5	0.52±3.27	0.164
Pre-operative Vs 6 months	0.035	0.025	-

## DISCUSSION

In maxillofacial surgery the administration of mandibular condylar fracture has unclosed large argumentation. The basic suggestions for medication of TMJ fractures (with restriction with a chin cap and a leather cuff, conventional medication) move back in the 1500 BC in the E.S's note<sup>8</sup>. Perthes, in 1924, for the very first time used the method of plate osteosynthesis for medication<sup>9</sup>. Nonsurgical administration has worked to minimize the cases of morbidity, simple ways to apply, reduce the medicational snags, lessen the cases of ankylosis and vascular necrosis, while comparing it with ORIF. When the plate and screw fixation devices were invented, ORIF moves towards its working. ORIF is more capable in anatomical reduction, posterior ramus height restoration, renovation of regularity of face and starting movement of the jaw. Harmony is not present for the administration of condylar fractures with closed method (MMF only) or open (ORIF) methods<sup>10</sup>. While in research in 20 persons, 16(80%) person were males and rest 20% were females. 13(65%) patients were ages between 5 to 25 years while 7(35%) patients had ages 26 to 50 years. A study conducted by Badar and Syed<sup>11</sup> and Wong<sup>12</sup> regarding management of mandibular condylar fractures reported that male patients population was high as compared to females 80 and 20%. Another

study conducted regarding condylar fracture reported that adult patients population was high as compared to paediatric and above 30 years population and male patients population was high as compared to females<sup>13,14</sup>.

In recent study, we found that Road traffic accidents was the most frequent cause of condylar fracture and reported 13(65%), Fall from height reported 5 (25%) and 2(10%) as inter-personal violence. A study conducted by Sawazaki et al<sup>15</sup> reported that traffic accidents were the most frequent cause of mandibular condyle fractures. Several other studies illustrated the same results as incident occurring on roads were one of biggest reason of condylar fractures<sup>16,17</sup>. We found 32 fractures in 20 patients. The site of condyle fracture was noted as Diacapitular, Head and neck as 65%, 25% and 10% respectively. These results shows the similarity to the other study in which base condylar fracture was the most common type of fractures<sup>18</sup>. Thirteen cases had found unerupted lower third molar and 7 cases had found erupted lower third molar. There are studies that suggest the raise in rate the delicacy of the mandibular angle and concurrently reduce the danger of condylar fracture is because of unerupted lower third molars (M3)<sup>19</sup>. There was no significant difference between the presence of unerupted lower third molar teeth and the angular fracture.

In the present study, we found mean preoperative ramus height difference between both sides of the mandible in the unilateral condyle fracture increase was notes as 5.25±5.15 mm in maxillomandibular fixation and 5.15±5.10mm in open reduction internal fixation. Mean Immediate post-operative ramus height was 3.22±4.45mm in MMF and -0.71±4.32. After 6 months mean post-operative ramus height was 1.44±4.5mm in MMF and -0.52±3.27mm in Open reduction. These results shows the similarity to some other studies conducted regarding management and treatment of condylar fracture in which they reported that there was not any prominent difference in both reduction method for restoration of ramus height after surgical treatment<sup>20</sup>.

## CONCLUSION

Retromandibular fixation method was easy and safe for the internal fixation of the condylar fractures and has better outcomes. We observed no major difference between both methods for medication of condylar fracture. Moreover, Road traffic accidents were the major cause of these malignant fractures and we should have to aware people to follow the traffic rules and use of helmets and safety belts to save their lives.

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