PATTERN OF CONDYALR FRACTURES AND ITS TREATMENT IN TERTIARY CARE HOSPITAL-A STUDY

Sertaj Khan[1], Ahmad Khan[1], Saifullah[1], Mohammad Tariq Khan[2], Khadija Syed[1], Muhammad Sohail[1], Syed Asad Shah[1], Ruqayyah Younis[1], Umar Khitab[1]

[1]Department of Oral and Maxillofacial Surgery, Bacha Khan Medical College/ Mardan Medical Complex Mardan

[2]Department of Oral and Maxillofacial Surgery, Saidu Medical College, Swat.

ABSTRACT

Objective: *To evaluate the occurrence of mandibular condylar fractures in our area regarding age, gender, etiological factors, type and level, any associated facial fractures and treatment modality adopted in our centre.*

Materials and Methods: *Data of 120 patients presented with the features of mandibular condylar fracture at Oral and Maxillofacial Surgery Unit, Bacha Khan Medical College Mardan from September 2016 to October 2019 was recorded. Non probability, convenience sampling technique was used. History, clinical and radiographic examination was performed for diagnosis. Treatment modalities included conservative, closed reduction and open reduction and internal fixation. Data regarding the age, gender, etiology, pattern and level of fracture, associated facial fractures and treatment modalities were evaluated and analyzed.*

Results: *Mean age was 21 ± 11.97 years, with an age range of 5-75 years. Age group 11-20 years were most commonly affected (38.4%).The ratio of male and female was 3.80:1. Road Traffic Accidents (38.3%) was the common cause of injury. Unilateral fractures (65%) dominated the bilateral pattern (35%).Condylar head was most common fracture (58.60%). Parasymphysis was most common associated fractures (26.3%) followed by body and zygomatic bone (18.4%). Most of the patients were treated by closed reduction (54.2%).*

Conclusion: *Public awareness is required regarding the significance of the condylar injuries. Randomized Controlled Trials are required to compare the outcome of different treatment modalities.*

Keywords: *Condylar fractures, Etiology, Associated fractures, Treatment Modalities*

INTRODUCTION

Mandible is an important bone in facial region that plays an important role in esthetics and function. Being exposed in facial skeleton, it fractured most commonly than other facial bone. Mandibular fractures occur most commonly at parasymphysis followed by condyle.[1,2] Condyle is considered a structurally weak bone due to its shape and slenderness at neck.[3]

The level and displacement of fracture depend on the direction, magnitude, site of application of the force, status of dentition4. In literature, fractures of the mandible that involve the condyle range from 20% to 35%.[5,6] These fractures cause severe morbidity, facial deformity and financial cost.[2,6] Being a mobile bone in facial region, its fracture is commonly noticed by individual causing pain during oral function.[7]

The etiology of condylar fractures varied and depends upon cultural, social and geographical factors of particular region.[1,4,7] Studies have reported assault as the leading cause followed by Road Traffic Accidents (RTA) in developed countries, but in developing and undeveloped world, the leading cause is RTAs followed by fall.[4,6,8] In some studies Falls are frequently related to condylar fractures in

Correspondence:
Dr. Sertaj Khan
Associate Professor, Oral and Maxillofacial Surgery, Bacha Khan Medical College/ Mardan Medical Complex Mardan.
Email: maxfacsurgery596@gmail.com
Contact: +923339690595

women and children.[9,10,11]

Diagnosis of maxillary fractures depends upon history, clinical and radiographic examination and confirmed by orthopantomogram (OPG), advanced imaging like CT scan and MRI. Three-dimensional imaging is the ideal tool for providing informations regarding classification, fragmentations and any displacement.[8,12]

Management of condylar fracture has been an issue of controversy in international literature.[4,5] Non surgical management both conservative and closed reduction is still the main treatment options for non or minimally displaced fractures and young patients.[13,14] Functional therapy allows early mobilization, stimulate condylar growth and bone remodeling. Open reduction and internal fixation (ORIF) is indicated for bilateral or considerably displaced and dislocated condylar fractures.[4,5,13,14]

Post operative or non operative complications are infection, facial nerve weakness, scar, pain, trismus, deviation of mandible, ankylosis, malocclusion, TMJ dysfunction and facial asymmetry.[15,16,17] It is therefore, necessary to diagnose and treat condylar fracture in time to avert any complications.

The purpose of the present study is to evaluate the occurrence of mandibular condylar fractures in our area regarding age, gender, etiological factors, type and level, any associated facial fractures and treatment modality adopted in our centre. This study will help us in the collection of the data regarding condylar fractures in our part of the world and will also be helpful to adopt proper treatment modality in future.

MATERIALS AND METHODS

The present descriptive study had been carried out on 120 consecutive patients of both gender and any age group presenting with the features of mandibular condylar fracture at Oral and Maxillofacial Surgery Unit, Bacha Khan Medical College Mardan from September 2016 to October 2019. Non probability, convenience sampling technique was used. Approval of study was taken from ethical committee of the hospital. With the consent of the patients, a detailed history was taken and thorough clinical examination was carried out. Routine investigations, orthopantomogram (OPG) and CT were performed for every patient supplemented by MRI when necessary. Cases already treated were excluded from the study. The diagnosis, established, was based on history, clinical and radiographic examination in all cases. Treatment modalities included conservative/ functional treatment, closed reduction and open reduction and internal fixation.

Conservative/ functional treatment included putting patient on soft diet and active phys¬iotherapy, closed reduction by using eyelet wiring or arch bars and Maxillo-Mandibular Fixation (MMF) and open reduction and internal rigid fixation using titanium mini plates. The data concerning the study so obtained on preformed proforma and evaluated and analyzed by applying descriptive statistics.

RESULTS

Mean age was 21 ± 11.97 years, with an age range of 5-75 years. Age group 11-20 years were most commonly affected (38.4%) followed by age group 21-30 years (25%) (Table1).

The ratio of male and female was 3.80:1, (Fig 1). Road Traffic Accidents (38.3%) was the common cause of injury followed by fall (31.7%) and assault (12.5%) (Table2).

Unilateral fractures (65%) dominated the bilateral pattern (35%) (Table3). Condylar head fractures was most common (58.60%) followed by subcondylar (29.70%) (Table4). Distribution according to associated fractures showed that parasymphysis fracture was most common (26.3%) followed by body and zygomatic bone (18.4%) (Table5). Most of the patients were treated by closed reduction (54.2%) (Table6).

Table 1: Age Distribution of Patients with Condylar Fractures

S. No.	Age Groups	No. of Patients	Percentage
1	1-10	16	13.4
2	11-20	46	38.4
3	21-30	30	25
4	31-40	10	8.3
5	41-50	09	7.5
6	51 -60	07	5.8
7	More than 60 years	02	1.6
Total		120	100

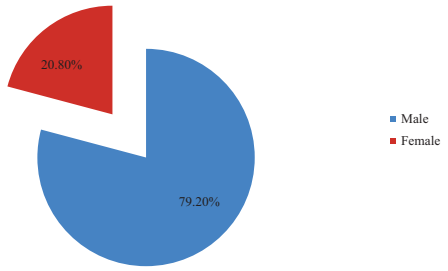

Figure 1: Gender Distribution of Patients

Table 2: Distribution According to Etiology

S. No.	Etiology	No, of Patients	Percentage
1	Road Traffic Accidents	46	38.3
2	Falls	38	31.7
3	Assault	15	12.5
4	Sport Related	9	7.5
5	Others	12	10
Total		120	100

Table 3: Distribution of Patients According to Pattern of Condylar Fracture

S. No.	Pattern of Fractures	No, of Patients	Percentage
1	Pattern of Fractures	No. of Patients	Percentage
2	Unilateral	78	65
3	Bilateral	42	35
Total		120	100

Table 4: Distribution According to Level of Condylar Fracture

S. No.	Level of Fracture	No. of Fracture	Percentage
1	Condylar head	95	58.60
2	Condylar neck	19	11.70
3	Sub-condylar	48	29.70
Total		162	100

DISCUSSION

Changes in life style have significantly affected the pattern of facial injuries all over the world in recent times. Factors that affect the pattern of condylar fracture are geographic region, type and size of population, economic status of people, government policies and era. This study was conducted to evaluate the pattern and treatment options of condylar fractures presented to Mardan Medical Complex Mardan.

Table 5: Distribution of Patients with Associated Fractures

S. No.	Type of Associated fracture	No. of Patients	Percentage
1	Symphysis	10	13.1
2	Parasymphysis	20	26.3
3	Body	14	18.4
4	Angle	2	2.6
5	Ramus	2	2.6
6	Maxilla	12	16
7	Zygomatic bone	14	18.4
8	NOE Complex	2	2.6
Total		76	100

Table 6: Treatment for Condylar Fractures

S. No.	Procedures	No	Percentage
1	Conservative/ Functional	26	21.6
2	Closed Reduction	65	54.2
3	Open Reduction and Internal Fixation	29	24.2
Total		120	100

In this study the most commonly affected age group was 21-20 years. This figure correlates with few studies conducted in Pakistan,[14] but are contradicts with the results of Badar AM1 where the common age groups was 21-30 years. Comparing the results with international studies these results coincides with the study done by Mahgoub MA et al[19] and Zhou HH,[20] where the most common age was 2nd decade. However, these results deviate from some studies,[9,21] where the commonly involved age group was 3rd decade. The frequency of condylar fractures increase from 2nd to 3rd decade and then gradually decreased on onward years. Children in young age are under parental supervision and their bones are resilient which make them less prone to fracture. However, as the age progresses, they involved in daily physical activities which makes them vulnerable to trauma.

The high ratio of male over female (3.80:1) shows that condylar fractures were more common in the male than female in our country. Similar results have been reported from local and international liter-

ature.[1,5,8,11,20,21] The predominance of male population may be due to active involvement of male gender in daily activities as compared to female.

Results of our study shows the leading cause of injury was RTA (38.3%) followed by falls (31.7%) and assaults (12.5%). Similar results were seen in the studies conducted in other areas of Pakistan.[1,6,8,12,22] These results are in conformity with other studies done in developed counties where RTA was the leading cause.[5,10,23]

The possible cause for the increased frequency of RTA in our area may also be the use motor cycle by teenagers, poorly maintained roads, non use of helmets and seat belts, over-speeding and frequent traffic rules violations. Trauma due to fall could be in children while playing or young men falling from heights while working.

In this study, out of 120 patients, 78 (65%) reported as unilateral while bilateral accounted for 42 (43.94%) cases. These results came in conformity with the study of Mahgoub MA,[19] Zhou HH[20] and Reddy NV[23] where bilateral condylar fractures occurred near to same frequencies.

This study also reported that condylar head fracture was the most common level (58.60%) followed by sub-condylar (29.70%). These figures are significantly more than that reported by most studies.[4,23] The result regarding level of fracture coincides well with the study of Zhou HH et al[20] and He et al[24] (65%) where condylar head fractures dominated other level. The studies of Reddy NV et al[23] and Zachariades N et a[l4] had reported sub-condylar fracture as the most common level followed by head, while Thapa S and co-workers[9] has reported condylar neck followed by head as the common level. This difference may be attributed to advances in imaging techniques and other variations in other variable like etiology, age group and gender. Most of the fracture in our study occurred in young (11-20 years) due to RTA and falls and diagnosis confirmed with CT scan in all cases.

It is also evident from the previous studies that concomitant mandibular fractures are more frequent with condylar fractures. Seventy six patients had associated fractures either at other site of mandible or may involve other facial bones. The common site was parasymphysis (26.3%) followed by body of mandible (18.4%). Among other facial bone fractures zygomatic bone involved in 18.4% cases. Bilateral condylar fracture was commonly associated with symphysis fracture while unilateral with parasymphysis and body fractures. Previous studies have also reported similar results about associated fractures.[4,9,10,20,23] All these studies have concluded that condylar fractures resulted from indirect forces applied at mandible causing either symphyseal or parasymphyseal fractures. Condylar fractures are commonly the result of the transmission of forces which is not fully absorbed in the majority of cases in the area of its primary application.

Treatment of mandibular condylar fracture is a debatable issue till time. Every patient should be evaluated thoroughly before a treatment. Surgeons have stressed on the importance of age and growth on the treatment outcome. Other factors are type of fracture, degree of displacement, status of occlusion.[25] Some aspects of the treatment protocol of Zide and Kent[26] was followed in this study. Most of the fractures in this study occurred in condylar head and in younger population, therefore, closed reduction with maxillomandibular fiaxation by Ivy eyelet wiring or arch bars was performed (54.2%). Open reduction and internal fixation was performed in[29] (24.2%) cases, and conservative/ functional therapy in[26] (21.6%) cases.

CONCLUSION

This study revealed that condylar fractures were more prevalent in male and in younger age group. RTA was the most common etiology of these fractures and the most common type was unilateral. More commonly fracture of condylar head occurred and the parasymphysis was the most commonly involved associated site. Closed reduction was performed in most cases.

Recommendations for the reduction in incidence of maxillary bone fractures are:

1. People awareness is required through electronic and print media about the importance of following traffic laws/rules to ensure their safety.
2. Parent education regarding the consequences of trauma to children at chin due will help to reduce the later complications like ankylosis.
3. Randomized controlled trials (RCT) are required to compare the results of different treatment options.

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