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ORIGINAL ARTICLE

Assessment of Patterns of Mandibular Condylar Fractures: A Study from Multan

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ABSTRACT

Objective: To assess the frequency of patterns of mandibular condylar fractures at Nishtar Institute of Dentistry, Multan.
Methods: This descriptive cross-sectional study was conducted at outpatient & ward of the oral & maxillofacial surgery department of Nishter Institute of Dentistry, Multan from September 2018 to February 2019. Patients aged 20-50 years with clinical and radiological diagnosis of mandibular condylar fracture within last 7 days were consecutively enrolled. The pattern of mandibular condylar fracture along with cause of fracture, site of fracture, and degree of displacement of fracture were noted.
Results: Out of 90 patients, mean age of the patients was 37.49 + 9.57 years. There were 70 (77.8%) males and 20 (22.2%) were females. The mean duration of fracture was 1.61 + 1.15 days. RTA was the cause among 45 (50%), fall in 17 (18.9%), FAI in 12 (13.3%), fight in 11 (12.2%) and sports in 5 (5.5%) patients. Intracapsular fractures of the condylar head were found in 11 (12.2%), condylar neck fracture in 22 (24.4%), and subcondylar fractures in 57 (63.3%) patients. Displaced fracture was noted in 73 (81.1%) of the patients. Of these 73 patients, ≤5 mm displacement was observed in 59 (80.8%) and >5 mm in 14 (19.2%) patients.
Conclusion: Unilateral subcondylar fractures of less than 5mm displacement were the most frequently assessed patterns of mandibular condylar fractures with the predominant etiology of Road Traffic Accidents.
Keywords: Mandibular fracture, Sub-condylar fracture, Road traffic accident.

INTRODUCTION

Maxillofacial trauma has been investigated worldwide because it affects a significant proportion of trauma patients and can become a serious clinical problem due to the complexity of this specific anatomical region.[1] Maxillofacial injuries are also frequent in Pakistan, with a high incidence of facial fractures reported in various combinations.[2] Mandible fractures are the most common among facial fractures, occurring in up to 58% in isolation and almost 52% in combination with other facial fractures[3], and the highest prevalence of mandibular fractures is condylar fractures.[4-8]
The mandibular condyle may be broken by direct and indirect trauma, and the displacement shall be determined by the direction, degree, magnitude and point of contact of the impact, as well as by the state of the dentition and the occlusal location.[7] Condylar fractures may be subclassified on the basis of anatomical fracture rates to extracapsular (condylar neck or subcondylar neck) or intracapsular (condylar head) and on the basis of the degree of displacement to undisplaced, deviated, displaced or dislocated.[8]
There are two approaches to treating mandibular condylar fractures; one is a conservative approach with closed reduction while the other is an open reduction with internal fixation. The current direction of mandibular condylar fracture therapy is to conduct an aggressive, open reduction as often as possible rather than a cautious, closed reduction.[4]

Keeping in mind the frequent occurrence of Maxillofacial injuries in Pakistan and the fact that Mandible fractures are the most severe among facial fractures, it is very important to understand the trends of injuries, their relative frequency and proper management protocols for these fractures in order to avoid complications, as this can lead to functional and esthetic problems such as facia. This research was therefore intended to assess the frequency of patterns of mandibular condylar fractures at Nishtar Institute of Dentistry, Multan.

METHODS

This descriptive cross-sectional study was conducted at outpatient & ward of the Department of Oral & Maxillofacial Surgery, Nishter Institute of Dentistry, Multan from September 2018 to February 2019. Ethical approval was obtained from Nishtar Institute of Dentristry prior conducting of the study. Study protocol and use of data for research was explained to patients to get fully informed consent.

Patients with mandibular condylar fractures of short duration (within 7 days) and belonging to both genders ranging in age from 20 to 50 years diagnosed clinically and radiographically as having condylar fracture were consecutively enrolled. However, patients were excluded those who are edentulous and having fractures due to an iatrogenic cause, malunioned and maltreated fractures and pathological fractures [tumor, cyst].

Cause of etiological factors like road traffic accident (RTA), fall, fight, firearm injury (FAI), and sports were noted along with and type of condylar fracture which was established on radiographic examination in all patients. In addition to this, site of fracture and displacement was also noted.

Data were entered and analyzed via Statistical Package for Social Sciences (SPSS) Version 21. Descriptive statistics like mean and standard deviation were explored for quantitative variables like age and duration of fracture whereas frequency and percentages were computed for qualitative variable like gender, etiological factors, site of fracture, anatomical levels, and displacement.

RESULTS

Of 90 patients, majority of the patients were males 70 (77.8%) whereas 20 (22.2%) were females. The mean age of the patients was 37.49 + 9.57 years. The mean duration of fracture was 1.61 + 1.15 days ranging from a minimum of 1 to a maximum of 5 days. Fractures were found to be bilateral in 21 (23.3%) patients, whereas it was unilateral among 69 (76.7%) patients. Among those with unilateral fractures 38 (55.1%) were on the left site whereas 31 (44.9%) on the right site.

The comparison of various etiologies responsible for the fracture showed that RTA was the cause among 45 (50%) of the patients, fall in 17 (18.9%), FAI in 12 (13.3%), fight in 11 (12.2%) and sports in 5 (5.5%). Most of the male patients had history of RTA 45 (64.3%) whereas FAI injury was reported in majority of the female patients 12 (60%). RTA was also found higher in patients with left site of fracture 24 (63.2%), bilateral fracture 21 (100%), undisplaced fracture 17 (100%), and sub condylar anatomical levels 45 (78.9%). (Table 1)

Intracapsular fractures of the condylar head were found in 11 (12.2%) of the patients, condylar neck was fractured among 22 (24.4%), while subcondylar fractures were found in 57 (63.3%) of the patients. A higher frequency of sub condylar fracture was found in

Table 1: The comparison of etiological factors with general characteristics of the patients (n=90)

Variables	RTA (n=45)	Fall (n=17)	Fight (n=11)	FAI (n=12)	Sports (n=5)
	n (%)	n (%)	n (%)	n (%)	n (%)
Gender					
Males	45 (64.3)	17 (42.3)	8 (11.4)	0 (0)	0 (0)
Females	0 (0)	0 (0)	3 (15)	12 (60)	5 (25)
Site of Fracture					
Left	24 (63.2)	14 (36.8)	0 (0)	0 (0)	0 (0)
Right	0 (0)	3 (9.7)	11 (35.5)	12 (38.7)	5 (16.1)
Bilateral	21 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Displacement					
Un-displaced	17 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Displaced	28 (38.4)	17 (23.3)	11 (15.1)	12 (16.4)	5 (6.8)
Anatomical Levels					
Sub Condylar	45 (78.9)	12 (21.1)	0 (0)	0 (0)	0 (0)
Condylar Neck	0 (0)	5 (22.7)	11 (50)	6 (27.3)	0 (0)
Intracapsular Head	0 (0)	0 (0)	0 (0)	6 (54.5)	5 (45.5)

RTA: Road Traffic Accident, FAI: Foreign Body Aspiration

males 57 (81.4%), patients having left site of fracture 36 (94.7%), bilateral fracture 21 (100%), and undisplacement 17 (100%). (Table 2)

Displaced fracture was noted in 73 (81.1%) of the patients. Of these 73 patients with displaced fractures, ≤5 mm displacement was observed in 59 (80.8%) and >5 mm was observed in 14 (19.2%) patients. Displacementof >5 mm was observed higher in female patients 14 (70%), right site of fracture 14 (45.2%), intracapsular head 11 (100%), and sports as etiological factor 5 (100%). (Table 3)

Table 2: Comparison of anatomical levels with general characteristics of the patients (n=90)

Variables	Anatomical Levels		
	Sub Condylar	Condylar Neck	Intracapsular Head
	n (%)	n (%)	n (%)
Gender			
Males	57 (81.4)	13 (18.6)	0 (0)
Females	0 (0)	9 (45)	11 (55)
Site of Fracture			
Left	36 (94.7)	2 (5.3)	0 (0)
Right	0 (0)	20 (64.5)	11 (35.5)
Bilateral	21 (100)	0 (0)	0 (0)
Displacement			
Un-displaced	17 (100)	0 (0)	0 (0)
Displaced	40 (54.8)	22 (30.1)	11 (15.1)

RTA: Road Traffic Accident, FAI: Foreign Body Aspiration

Table 3: Comparison of displaced fracture with general characteristics of the patients (n=90)

Variables	Displaced Fracture	
	≤5 mm	>5mm
	n (%)	n (%)
Gender		
Males	53 (100)	0 (0)
Females	6 (30)	14 (70)
Site of Fracture		
Left	38 (100)	0 (0)
Right	17 (54.8)	14 (45.2)
Bilateral	4 (100)	0 (0)
Anatomical Levels		
Sub Condylar	40 (100)	0 (0)
Condylar Neck	19 (86.4)	3 (13.6)
Intracapsular Head	0 (0)	11 (100)
Etiological Factors		
RTA	28 (100)	0 (0)
Fall	17 (100)	0 (0)
Fight	11 (100)	0 (0)
FAI	3 (25)	9 (75)
Sports	0 (0)	5 (100)

RTA: Road Traffic Accident, FAI: Foreign Body Aspiration

DISCUSSION

This study was conducted to determine the frequency of mandibular condylar fracture patterns. Because males predominated in this study (77.8%), most of the etiologies responsible for mandibular condylar fractures, including fighting, weapon injury, aggression and sports, were primarily present in males.[5] A male predominance in patients with mandibular condylar fractures has been identified in other studies, such as Marker[9] and Zaccharides[4], in which a male-to-female ratio of 2:1 and 3:1 was found.

In the current study, the mean duration of fracture was 1.61 + 1.15 days, reflecting the recent history of mandible injury in cases of fractures in this study. The majority of fractures were unilateral, with a small number of left-site fractures. It is in line with previous studies, which have indicated more left-site unilateral mandible fractures.[10,11,13] Among all these patients, whether bilateral or unilateral, the proportion of males and females remained almost identical to that of the overall gender distribution in the study population. This result is consistent with results from many other studies.[10,12-14] In the Zaccharides[4] report, males accounted for 78.3 percent, while females accounted for 21.7 percent of the patient population. There was also a similar distribution of the fracture hand, with 26.3 percent bilateral fractures, 47 percent on the right and 53 percent on the left.

Among the etiological factors responsible for the fracture of the mandibular condyle, it was found that the road traffic accident (RTA) was the most frequent cause and was responsible for the fracture in half of the cases. The next most common cause of fracture found in our study population was RTA, followed by fall, firearm injury, sport, and fighting. RTA has also been stated to be the most common cause of mandibular fracture in other studies.[4] Zaccharides[4] recorded that RTA was the responsible cause of 466 mandibular condyle fractures in more than 55% of patients. The cumulative percentage of fighting and firearm injury is higher in our sample, which may represent higher baseline psychosocial instability in our society, resulting in higher crime rates and increased abuse. However, this is an incidental finding and is not conclusive. It needs further evaluation as our study was not designed to reflect on this aspect.

Literature suggests that most fractures are of a displaced form relative to an undisplaced type.[14-18] Whereas, the majority of the fractures displaced had a displacement of less than 5 mm. A study of 466 fractures of Zaccharides[4] found that 68% of patients had displaced fractures compared to 19% of cases wit undisplaced fractures, while an additional 12.67 percent of patients had deviated fractures. Such estimates are consistent with our results in the report. We had deviated fractures in the displacement > 5 mm category because of the simplicity of the x-ray analysis and to prevent error bias.

Taking into account the anatomical level of fracture, the mainstream of the related studies[14, 16-21] supports the results of the current study that the majority of fractures occurred at subcondylar level, whereas condylar head fractures were the least frequently found in the intracapsular region. Zaccharides recorded that 62.23 percent of the fractures were subcondylar and subcondylar.[4]

The results of the study could be highlighted in the light of the limitation that this study was merely a descriptive epidemiological study and that the sample size of the research was also small. Further large-scale systematic studies are suggested to exclude the findings of this study.

CONCLUSION

Unilateral subcondylar fractures of less than 5mm displacement were the most frequently assessed patterns of mandibular condylar fractures with the predominant etiology of Road Traffic Accidents.

ETHICAL APPROVAL: The protocol for this study was approved by the ethical review committee of Nishtar Institute of Dentistry, Multan.

AUTHORS' CONTRIBUTION: AR, AM & BK substantially contributed to the conception and design of the study. SN, MSM and RA worked in acquisition, analysis and interpretation of the data. Revised critically for intellectual content and gave final approval.

CONFLICT OF INTEREST: There is no conflict of interest that may profit or lose through the publication of this paper.

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