Research article

# Patterns, Types and Causes of Mandibular Condyle Fractures, association with other Mandibular Fractures at LUMHS Hospital Hyderabad, Sindh.

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**LMRJ. 2020; 2(3)**
**Doi: 10.38106/LMRJ. 2020.2.3-03.**

**Abstract:**
The objective of current study was to assess the patterns, causes and types of mandible condylar fractures and relationship between mandible condylar fractures with associated mandible fractures. This prospective study was conducted at Oral & Maxillofacial surgery department LUMHS Jamshoro/ Hyderabad. History, clinical examination and radiographic analysis of 60 mandibular condylar fracture patients were performed and data were recorded. Data was analyzed on SPSS 16. Out of total 60 patients with mandible condylar fractures, n=51 (85%) were male and n= 09 (15%) were female. Age range of patients was 4 to 56 years) and mean age of 28 years and third decade was most common. The road traffic accident was common cause of mandibular condylar fractures n=29 (48.33%) followed by assault n=14 (23.33%) and fall n=12 (20%). Unilateral fractures were n=49 (82%) and n=11 (18%) were bilateral fractures. Mandible Subcondylar fractures were the most common, both in the unilateral and bilateral groups which accounted for 38 (63%), condylar neck were 16 (27%), condylar head were 06 (10%). 36 (60%) were isolated condylar fractures and 24 (40%) were associated with other mandible fractures. Road traffic accident was found to be common cause of condylar fracture. Young male adults were involved in most of the accidents, with the unilateral pattern and subcondylar fractures type were more common. It divulges inadequate road traffic logic in road users, lack of road protection methods and rule in our population.

**Key words**: Assault, Mandible condylar fractures, Road traffic accident and Subcondylar fracture.

## Introduction

Mandible is the most commonly fractured bone in facial region. [1-3] An analysis of fractures frequency in different anatomic sites of the mandible shown that, condylar fractures are most common fractures in the mandible [2,4,5] . It is also frequently over-looked and least detected fracture site in the facial region.[6] Mandibular condyle is involved in up to one third of all mandible fractures, with a frequency that range

from 10% to 57%. [7-9] Several studies suggest that after the angle and body fracture, the second most mandible fractures are condyle region. [7,10] while few studies showed that condyle fractures are most common after symphysis and parasymphysis. [1, 9] Direct or indirect trauma can fracture condyle, usually result from force applied at the body or symphysis region which is transmitted to the condylar process. [11,12]

Etiology of the condyle fractures varies in accordance with both sociologic and age factors. Different studies have confirmed that motor vehicle accidents are the most common cause,[1,13] others proved that IPV are most common cause, [11,14,15] while falls are also predominant cause in few studies, especially in females and young children.[6,16] Condylar fractures may occur isolated or associated with other mandible fractures.[14] Extracapsular fractures are more predominant than intracapsular in all age, subcondylar fractures are more common in adults than children.[14,17] In particular, in children mandibular fractures differ significantly from adults because of growth and inadequate dentition of the mandible.[16] In children the condylar intracapsular fracture usually cause temporo-mandibular joint ankylosis and masticatory disability.[16] Treatment of mandible condylar fracture is still controversial in respect of conservatively or surgically. Principal factors that determine the treatment decision include level of fracture, site of fracture, and patient's age. [18, 19] Therefore it is important for both functional and cosmetic reasons that condylar fractures should be properly diagnosed and adequately treated. There have been many articles published about fractured mandible, but only few of them have focus on patterns of mandibular condylar fractures. This study will determine the patterns of mandibular condylar fractures, with all their relative characteristics, common age group and causes of condylar fracture in this part of the country. This will help in proper diagnosis and management of fractured mandibular condyle.

## Patients and Methods

This descriptive study was conducted at LUMHS Hyderabad. A total of 60 patients of mandibular condylar fracture who attended the OPD or Emergency department from 1st July 2014 to 30th June 2015 were part of this study. An informed consent was taken from the all patients or their attendants. History of trauma was asked from the patient or attendant and recorded. Diagnosis of mandibular condylar fracture was made by history, clinical findings and appropriate radiographs. Conventional radiographs orthopentomogram (OPG) and postero-anterior view of face (P.A) X-rays were used for all the patients. All the significant information was recorded on pre-designed proforma, including patient's demographic data, etiology, patterns and relationship of fractures. We classified fractures as described by Lindahl classification of fracture mandible condyle; Condylar head fracture, Condylar neck fracture and Sub condylar fracture. Data was analyzed on (SPSS) version 16.0. Categorical variables (ie sex, etiologies, and pattern) was analyzed by frequency and percentages and for continuous variables, (like age) mean was computed. No inferential test was used because of descriptive statistics.

## Results

Out of 60 patients, n=51 (85%) were males and n=9 (15%) were females, with male/female ratio of 5.7:1. Males were predominant in all age groups of patients. Road traffic accident (RTA) was the common cause

of mandibular condylar fractures n=29 (48.33%) followed by inter personal violence (IPV), n=14 (23.33%). Male patients were predominated involved in RTA and IPV, which accounted 27 (45%) and 14 (23.33%) respectively. While fall was more prevalent in females. Among unilateral fractures, right side was 27 (55%) slightly more than left side which accounted 22 (45%). Bilateral condylar fractures were mostly occurred by considerable force through (RTA and fall) as compared to lesser force through (Assault). Of the total samples, n=36 (60%) were isolated condylar fractures and n=24 (40%) were associated with other mandibular fractures.

**Table 1: Age distribution with Gender of condylar mandibular fractures.**

| Age (yrs) | Male | Female | Total | Percentage |
|---|---|---|---|---|
| 01-10 | 06 | 02 | 08 | 13% |
| 11-20 | 08 | 02 | 10 | 17% |
| 21-30 | 18 | 02 | 20 | 33% |
| 31-40 | 12 | 00 | 12 | 20% |
| 41-50 | 04 | 02 | 06 | 10% |
| 51-60 | 03 | 01 | 04 | 07% |
| **Total** | **51** | **09** | **60** | **100%** |

**Table 2: Causes of the mandibular condylar fractures with Gender**

| Etiology | Male % | Female % | Total % |
|---|---|---|---|
| RTA | 27 (45%) | 02(3.33%) | 29 (48.33%) |
| IPV | 14 (23.33%) | _ | 14 (23.33%) |
| Fall | 05 (8.33%) | 07(11.67%) | 12 (20%) |
| Sport | 03 (5%) | _ | 03 (5%) |
| Others | 02 (3.33%) | _ | 02 (3.33%) |
| Total | 51 (85%) | 09 (15%) | 60 (100%) |

**Table 3: Pattern of Mandibular Condylar fracture.**

| Pattern | Male | Female | Total | Percentage |
|---|---|---|---|---|
| Bilateral fracture | 09 | 02 | 11 | **18%** |
| Unilateral fracture | 42 | 07 | 49 | **82%** |
| **Total** | **51** | **09** | **60** | **100%** |

**Table 4: Types of Mandibular Condylar fractures.**

| Etiology | Condylar Head | Condylar Neck | Sub Condylar | Total |
|---|---|---|---|---|
| RTA | O2 | 07 | 20 | 29 |
| IPV | -- | 02 | 12 | 14 |
| Fall | 04 | 05 | 03 | 12 |
| Sports | -- | 01 | 02 | 03 |
| Others | -- | 01 | 01 | 02 |
| **Total %** | **06(10%)** | **16(27%)** | **38(63%)** | **60(100)** |

**Table 5: Isolated and Combine fractures of mandible condyle region**

| Pattern | Bilateral | Unilateral | Total | Percentage |
|---|---|---|---|---|
| Combine fracture | 02 | 22 | 24 | 40% |
| Isolated fracture | 09 | 27 | 36 | 60% |
| **Total** | **11** | **49** | **60** | **100%** |

## Discussion

Among Gender 85% (n=51) of patients presenting with mandible condyle fractures were males, and

only 15 % (n=9) were females, this male dominance in this study could be because of such fractures result from road traffic accident, assault, fall, sports injury etc, where men are dynamically involved. This ratio is comparable to those reported by Kim YK at al [19] Bormann K H et al, [11] and Silvennoinen U et al. [14] However it is greater than that reported by Amaratunga N.A.de S, [20] Thoren H et al. [21] Marker P et al. [15] Increase in female ratio in their studies indicates that women in this part of world are more vulnerable to facial injuries, because of their participation in outdoor activities. The low ratio of female in our study was because most female are house bound and their outdoor activities are limited.

Male in the third decade constituted the major group in this study, similar to the data reported by Sawazaki R et al, [13] Silvennoinen U et al, [14] and Marker P et al.[15] During this age of life, the young adults are dynamically involved in outdoor activities, which makes them more prone to facial injuries in this age. The causes of facial injuries have changed by decade to decade. Data reported in our study showed, road trafficaccident was the common cause of mandible condyle fracture 29 (48.33%). This result was different from the results of Kim YK et al,[19] Silvennoinen U et al,[14] Rikhotso E et al,[23] and Adam CD et al [24] from Australia, this show that the causes of maxillofacial trauma varies because of social, cultural and geographic setup. The result of this study is comparable with those reported by Klenk G et al, [10] and Abbas I et al. [25] In our country, road traffic related maxillofacial injuries occurred because of not properly followed traffic regulations , poor condition of vehicles and inappropriate size of roads. As compared to developed countries there is, well-trained drivers, broader roads, and traffic regulation is also strictly followed which make different in accident.

Subcondylar fractures were most common in present study that was 63%, and Condylar neck fractures 27%, which is comparable with study of Silvennoinen U et al,[14] and zachariades N et al, [19] but different from Sawazare R et al, [13] and Marker P et al. [15] studies. Present study observed condylar head fractures 10% and mostly occurred in below age 6 years, similar to the data reported by Choi J et al, [6] and Thoren H et al. [22] Type of condylar fractures seems to be influenced directly by its cause. Subcondylar fractures are tension failures in response to bending of the mandibular neck, because the mandible distributes the force of impact, frequently fractures occur only in subcondylar region. [26] In present study unilateral condylar fractures were reported 49 (82%), similar to the data observed by previous studies in Finland 1992, [14] and South Africa 2008 [23] and Denmark 2000, [15] Among unilateral condylar fractures right side was encounter more as compare to left side in our study.

In our study 36 (60%) of condylar fractures were isolated and 24 (40%) were combine with other mandible fractures. Those results are comparable with previous study by Silvennoinen u et al, [14] and Newman A. [17] It seems that condylar fractures consequences from an indirect force applied to the mandible [26] This submits that condyle fractures may be the result of the exertion of force which is not fully absorbed in the majority of cases in the area of its primary application, i.e the mental region.

## Conclusion

This study showed that RTA were the main cause of condylar fractures, Subcondylar fracture and unilateral mandibular condylar fracture is more common. Diagnosis of patterns and types of condylar fracture is essential for proper treatment and management.

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