

Mandibular Condylar and Angle Fractures and their Inter Relationship with Impaction Status of Mandibular Third Molar

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ABSTRACT

Introduction: Mandible is a solid and the most rigid bone of the facial skeleton. However, it is the second most commonly fractured facial bone. Its anatomic position renders it susceptible to fracture. The most common sites of fracture in the mandible are angle, condyle, symphysis and body in decreasing order of frequency. The aim of the study was to study the inter relationship of mandibular third molar impaction with mandibular fracture types. **Material and methods:** Study population comprised of patients with mandibular fractures reported to the department of OMFS at Government Dental College and Hospital, Srinagar from January 2015 to June 2021. Patients with only unilateral and isolated angle or condylar fracture of the mandible were considered for the study and they had to be above 15 years of age. A total of 178 patients were included in the study. **Results:** Out of 178 patients studied, 115 patients were that of condylar fracture, 63 fractures were of angle region. The most common cause of trauma was road traffic accident (118 patients), followed by fall (40) and interpersonal assault (20). Among patients with mandibular angle fracture, 55 patients (87.33%) showed the presence of mandibular third molars and 8 patients (12.67%) did not have third molars. In cases of condylar fractures, 76 patients (66%) showed absence of mandibular third molars, 39 patients (34%) had third molars. **Conclusion:** Our study revealed that the probability of angle fractures was statistically and remarkably higher in patients who had mandibular third molars as compared to those who did not have them. It also revealed that the incidence of condylar fractures was significantly lower in patients who had mandibular third molars as compared to those patients who lacked them.

Keywords: Mandibular Condylar, Angle Fractures, Inter Relationship, Mandibular Third Molar

INTRODUCTION

Mandible is regarded as a solid and most rigid bone of the facial skeleton however; it is the second most commonly fractured facial bone. This susceptibility is a result of its anatomic position, hence is at risk of maxillofacial trauma.¹ Mandibular fractures have been found to occupy a remarkable percentage of all maxillofacial trauma, as per studies done by Gassner et al and Tanaka et al noted that mandibular fractures account for 24.3 % and 68.6% of maxillofacial trauma, respectively.^{2,3}

The most usual sites of fracture in the mandible are condyle (29.1%), angle (24.5%), symphysis (22%), and body (16%). Nevertheless, there is a significant variation seen in different researches because statistics proposed by Ogundare et al

recommended angle fractures to have an incidence at 36%.⁴ Meisami et al provided statistics to prove that condylar and angle are almost equally fractured in mandible (25–33%).⁵ Etiologic causes of mandibular fractures are motor vehicle accidents, interpersonal assaults, falls, and sport activities including cycling.⁶⁻⁸ The results mentioned above may alter depending on the absence or presence of lower third molars. On the groundwork of the conclusion in a systematic review conducted by Armond et al.⁸

The risk of mandibular angle fractures is 3.27 times higher if lower third molar is present. The presence of mandibular third molar results in a weaker angle region hence increasing the risk of fracture. This occurrence may be associated to the disrupted cortical layer due to a superficially impacted mandibular third molar.^{8,9-11}

Bezerra et al exhibited in their finite element analysis the angle of mandible is more fragile when third molar is present. Although, in the absence of third molars the energy is directed on the lateral-posterior part of the condylar neck.¹¹ The prevalence of the above mentioned types of mandibular fractures also may vary based on the horizontal and vertical position of mandibular third molar, as assessed by the Pell and Gregory (P&G) classification.¹²

Class II and B third molars are thought to be as risk factors for angle fractures but decrease the risk of condylar fractures.⁸ In condylar fractures, when mandibular third molars are present, they are found in class I and A positions.⁸ The aim of this study was to study the inter relationship of mandibular third molar impaction with mandibular fracture types.

MATERIAL AND METHODS

The study population was comprised of patients with mandibular fractures reported to the Department of Oral and Maxillofacial Surgery at Govt. Dental College & Hospital between January 2015 and June 2021. This is major trauma centre of the region catering to a population of around 10 million.

Patients with only unilateral and isolated angle or condylar

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fractures of the mandible were considered for the study either the patients had only 1 fracture, either an angle or condylar fracture.

The exclusion criteria involved (1) patients whose Information was incomplete (2) were younger than 15 years, (3) had pan-facial fractures, (4) had edentulism, (5) had a lower third molar that presented only as a germ, (6) had bilateral (angle or condylar) or contralateral fractures.

Study variables

The primary predictor variable in this study was the absence or presence of third molars and, when a third molar was present, the impaction position of the third molar. For the impaction position, the positional data comprised vertical and horizontal positions, as assessed by the Pell & Gregory classification.¹²

The outcome variable in this study was the fracture location, that is, an angle or condylar fracture of the mandible. Based on the definitions provided by Kelly and Harrigan,¹³ a condylar fracture diagnosis was made when the level of fracture line was at or above the sigmoid notch. An angle fracture was defined as a fracture between the posterior border of the lower second molar and the ramus to a point on the part connecting the lower and posterior margins of the mandible.

Various other predictor variables included patient age and gender, also the causes of the trauma.

RESULTS

A total of 178 patients were included in our retrospective study. The patients included in our study had been diagnosed with angle and condyle fractures and were admitted in our department for same. Of the total, 115 patients were condylar fractures 63 fractures were of angle region.

Out of the total cases total no. of males was 138 and females were 40. Maximum no of patients were in 3rd decade of their life, with a mean age of 26.5 (figure-1).

The most common cause of trauma was Road Traffic Accident (118), followed by fall (40) and interpersonal assault (20) (figure-2).

Patients with mandibular angle fracture, 55 patients (87.33%) had presence of mandibular third molars and 8 patients (12.67%) did not have third molars figure-3. This presence of a mandibular third molar in angle fractures was

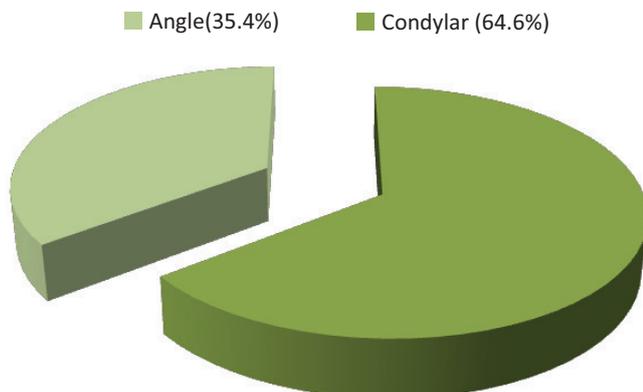


Figure-1: Type of Mandibular Fracture

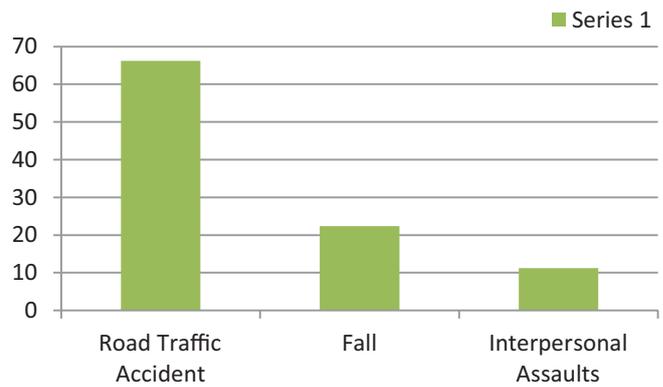


Figure-2: Cause of Trauma

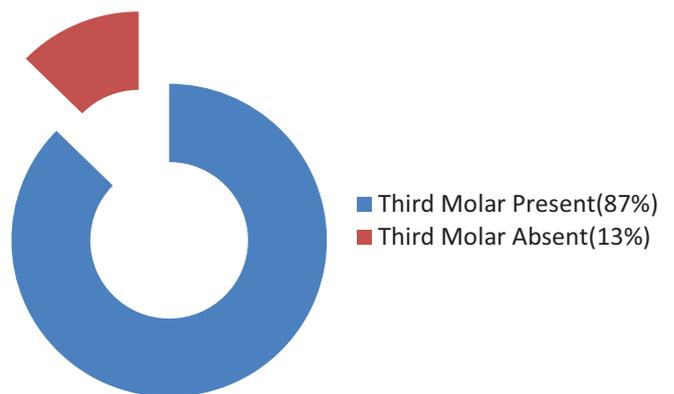


Figure-3: Angle Fractures

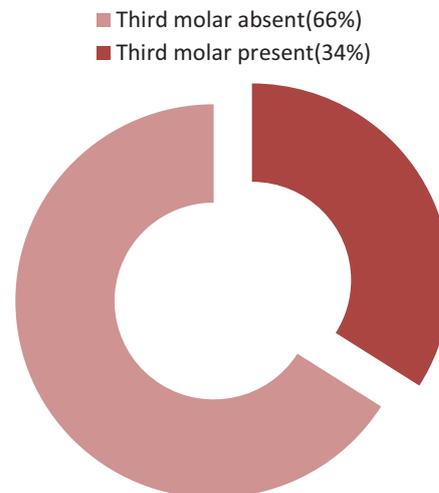


Figure-4: Condylar Fractures

statistically and remarkably higher than in patients who did not have them. In the condylar fractures, 76 patients (66%) had absence of mandibular third molars, whereas 39 patients (34%) had third molars (figure-4). The absence of a mandibular third molar in condylar fractures was statistically and significantly higher than in patients where third molars were present.

DISCUSSION

The objective of this retrospective study was to determine the relationship of the presence of the mandibular third molar and the fracture pattern of Mandible. Supposing that the strength of mandibular angle region is greatly compromised

due to the existence of the mandibular third molar, therefore making it susceptible to fractures.

Our study comprised of 178 patients and it revealed that in the presence of mandibular third molar, the probability of angle fracture was markedly higher than it was in case the third molar was absent.

The second most commonly observed fracture in the maxillofacial region is the mandibular fractures. The factors which determine the severity of mandibular fractures include: The intensity of impact, location and direction of the impact, as well as intrinsic factors (bone shape, density and thickness of bone, musculature, and presence or absence of teeth)^{9, 14-16} In most cases, the cause of fracture is a traumatic, high-intensity impact (e.g., traffic accident).⁹ In case of fractures induced by low-intensity trauma, such as a fight, physical violence, falls, or sports injuries, the impact may be transferred to other areas and this is why the weakest areas of the jaws are more prone to fracture because force is concentrated at these areas.⁹

In our study, mandibular fractures were most frequently caused by road traffic accidents, followed by falls and interpersonal violence.

Our study also revealed that an important risk factor for angle fractures was the presence of an unerupted mandibular third molar. This finding is in concordance with the results of various other studies which also suggested that unerupted lower third molars may multiply the risk of an angle fracture but may reduce the likelihood of a condylar fracture.¹⁷⁻²⁰

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