

MANDIBULAR THIRD MOLAR- A RISK FACTOR FOR ANGLE FRACTURE

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ABSTRACT

Objective: The purpose of this study is to evaluate the relationship between mandibular third molar and angle fracture.

Materials and Methods: This cross sectional study was carried out on 156 patients presenting to the Department of Oral and Maxillofacial Surgery Khyber College of Dentistry, Peshawar from May 2008 to April 2011. Each patient was thoroughly examined clinically and radiographically to determine the presence or absence of mandibular third molar in relation to angle fracture.

Results: Majority of the patients were young adults with male to female ratio of 4.3:1. In 73.7% of the angle fractured patients, lower third molar was present ($p=0.00$) which was considered statistically significant. Patients with unerupted lower third molar had 2.2 times more risk of angle fracture as compared to patients with third molar fully erupted.

Conclusion: The presence of mandibular third molar is significantly associated with an increased risk for angle fracture ($p<0.05$).

Key words: lower third molar, angle fracture, mandible

INTRODUCTION

Trauma to the face frequently causes injury to the teeth, soft tissues and bones of the face including mandible, maxilla, zygomatic complex, naso-orbitoethmoidal complex and supra-orbital structures¹. Due to the prominent and exposed position of the mandible, it is more commonly fractured as compare to other facial bones². Mandible fractures are never left unnoticed because it is very painful during function like mastication, swallowing and speech³.

The mandibular third molar is the most frequently impacted tooth accounting for 98% of all impacted teeth⁴. Several factors have been reported to be responsible for the high rate of mandibular third molar impaction. These include lack of space in the dental arch, late eruption sequence, abnormal angulations, aberrant path of eruption, overlying soft and hard tissue density.⁵

Mandibular angle fractures constitute about 30%

of all mandibular fractures. The mandibular angle area serves as a transition zone between dentate and edentate area and is frequently associated with impacted third molar⁶. Recent studies have shown that the risk of angle fracture increased 2 to 3 folds when an unerupted lower third molar is present^{7,8,9}.

The purpose of the present study is to access the relationship of the lower third molar with mandibular angle fracture.

METHODOLOGY

This is a descriptive (cross sectional) study, was carried out on 156 patients presenting to the Department of Oral and Maxillofacial Surgery Khyber College of Dentistry, Peshawar from May 2008 to April 2011. Patients who had mandibular angle fracture and age more than 18 years were included in the study after taking an informed consent. A comprehensive history and thorough clinical examination was carried out both extra orally and intra orally. Orthopantomogram (OPG) was advised to every patient to confirm the site of fracture and to determine the presence or absence of lower third molar. The data so collected was analyzed by SPSS using various descriptive statistical

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tools. The study hypothesis was that the presence of mandibular third molar is associated with an increased risk of angle fracture. Binomial test was applied and p value less than 0.05 was considered statistically significant.

RESULTS

A total of 156 patients were recruited in the study. Among these, 127 (81%) patients were male while 29 (19%) were female. The male to female ratio was 4.3:1.

Age range of patients at the time of presentation was 18-69 years with mean age of 39 ± 43.24 years. Majority of the patients were in the age between 21 to 40 years (64.7%) followed by patients with age group less than or equal to 20 years (21.2%). Details are given in Table 1.

Majority of the patients with mandibular angle fracture were associated with the lower third molar. Figure 1 shows that in 115 patients (73.7%) the lower third molar was present while in 41 patients (26.3%) it was absent. Thus patients with lower third molar were 2.8 times more involved in angle fracture as compared to patients without lower third molar ($p=0.00$).

Out of 115 patients of mandibular angle fracture having lower third molar, in 79 patients (68.7%) the mandibular third molar was unerupted while 36 patients (31.3%) the lower third molar was fully erupted. Thus patients with unerupted lower third molar were 2.2 times more at risk of angle fracture than patients in whom mandibular third molar was erupted.

Table - 1: Age distribution

Age Group in years	n	%
≤ 20	33	21.2
21-40	101	64.7
41-60	20	12.8
>60	2	1.3
Total	156	100

DISCUSSION

Mandible being the only mobile bone of the facial skeleton plays an important role in various functions like mastication and swallowing¹¹. There are various factors which affect the location of mandible fracture like site, magnitude and direction of force, systemic diseases, bony pathology and the presence of impacted teeth. Angle region is generally considered the weak area of mandible. It has been suggested that there is a change in the direction of bone trabeculae, which occurs where the vertical ascending ramus meet with the horizontal body which tend to weaken the angle region. The presence of third molar further contributes to the weakening of this area^{6,10}.

Majority of patients involved in mandibular angle fractures were male as compare to female with the male to female ratio of 4.3:1. This is in accordance with the studies of Abbasi et al¹, Raj Kumar et al⁶, Abbas et al¹¹ and King et al¹². The high percentage of male gender for all types of trauma can be due to the fact that males have more freedom to go outdoor and involve in various activities which make them more prone to accidents.¹³

Most of the victims were young adults with mean age of 39 ± 43.24 years. This finding is consistent with the published studies of Abbasi et al¹, Raj Kumar et al⁶, Abbas et al¹¹ and Leles et al¹⁴. This is due to the fact that young adults participate more actively in the society both socially and economically. Furthermore this age group is the phase of personal independence, social

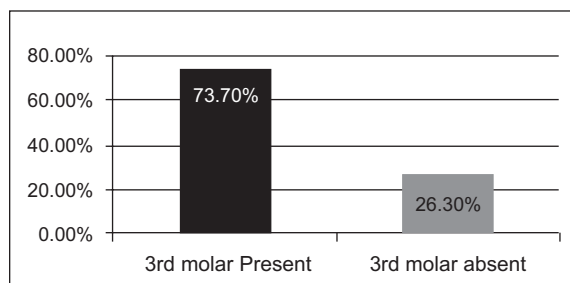


Fig - 1: Relationship of mandibular third molar with angle fracture

Binomial Test

		Category	n	Observed prop.	Test prop.	p-value
Third Molar	Group 1	absent	41	.26	.50	.000
	Group 2	present	115	.74		
	Total		156	1.00		

excitement, careless driving and exposure to violence. Therefore they are more exposed to maxillofacial injuries¹⁴.

In the present study, majority of the patients with mandibular angle fracture were associated with the lower third molar and they were involved 2.8 times more as compared to patients without third molar. These findings are in agreement with the similar International studies^{1,7,10,15,17,18}. One mechanism by which third molar increases the risk of angle fracture is by occupying osseous space which decreases the cross sectional area of bone and thus increases its susceptibility to fracture. It has also been reported that the incidence of mandibular angle fracture is very low i.e 0.0046% after mandibular third molar removal¹⁷.

Our results also imply that patients with unerupted mandibular third molar had sustained more angle fractures than those in whom third molar was fully erupted. Patients with unerupted lower third molar was seen to have a 2.2 times more risk of angle fracture as compared to patients having an erupted third molar. This is consistent with other studies reported in the literature^{6,19}. Halmos et al⁹ did a large multicentre study from three different major hospitals and found out a 2.8 fold increased risk for angle fracture in patients having an erupted lower third molar.

Yamada et al²⁰ divided their study population into two groups: mandibular fractures occurred during sports and fractures occurred due to other causes. They have found that the incidence of mandibular angle fracture was significantly higher in the sport group than in the other group ($p < 0.05$). They suggested a thorough examination of mandibular third molars in athletes playing contact sports in order to decrease the risk of mandibular angle fracture. Similarly Schwimmer et al²¹ also suggested dental screening and early removal of impacted third molar in young adults specially participating in contact sports.

CONCLUSION

- 1 Mandibular angle fractures are most common in young adult male population.
- 2 The presence of mandibular third molar is significantly associated with an increased risk for angle fracture ($p < 0.05$). This risk has further increased by 2.2 times in patients with an unerupted

lower third molar as compare to patients with fully erupted third molar.

RECOMMENDATION

People having high risk of mandibular fractures like those involved in contact sports should be aware of the presence of an unerupted mandibular third molar. They should take special protective measures like use of a mouth guard or face mask during sport to minimize the risk of injury.

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